

Policy Challenges for Macroeconomic Management and Growth in Pakistan

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Introduction

This book emerges from the 17th Annual Conference on the Management of the Pakistan Economy, hosted by the Lahore School of Economics. The Conference has become central to the School's mission to combine academic rigor with practical relevance—encouraging research that addresses Pakistan's evolving economic challenges.

Considering the objectives and timing of this Conference, it is helpful first to step back and assess the current state of Pakistan's economy. While we are all generally familiar with the prevailing conditions, it's essential to understand the complexities unique to managing Pakistan's economy. One significant factor is the 18th Amendment, which shifted substantial responsibilities and financial resources to provincial governments. While this move was correct, it created considerable challenges in managing the federal government's finances.

Historically, governments coming into power often prioritize raising resources or resorting to deficit financing to achieve their political objectives. Due to the federal government's constrained position, Pakistan frequently faces severe fiscal deficits. Recently, a sequence of events led to a significant economic crisis. These included a change in governance, a new political party coming to power, the COVID-19 pandemic, the end of the prolonged flood situation, and subsequent skyrocketing global commodity prices. Together, these events created what can be described as a "perfect storm."

Traditional structures struggled to manage these pressures, leading to an overheated economy and significant exchange rate distortions. Previous governments borrowed excessively, exacerbating the balance of payments crisis. Initial regulatory mechanisms intended to manage demand proved inadequate, and critically, the international community lost confidence in Pakistan's debt management capabilities.

From personal experience as a caretaker and advisor on finance in 2013, I distinctly recall how international partners, including Saudi Arabia and

China, made financial assistance conditional upon Pakistan reaching an agreement with the IMF. Consequently, Pakistan's economic stability remains significantly dependent on IMF agreements and endorsements.

The new government initially secured an IMF agreement, but the compounded effects of the earlier "perfect storm" limited its ability to adhere strictly to the agreed constraints. With IMF assistance, however, Pakistan achieved some macroeconomic stability. Nonetheless, significant challenges persist, and this Conference aims to offer insights into managing the current situation.

Some highlighted points include massive exchange rate adjustments, contributing to about half of Pakistan's inflation, as detailed in the paper by Dr. Moazam Mahmood and Dr. Azam Chaudhry and their Modeling Lab. Furthermore, increased commodity prices also played a notable role. These dramatic adjustments in exchange rates and domestic prices have significantly raised poverty levels, with current poverty alleviation measures proving insufficient.

Dr. Rashid Amjad's paper presents intriguing suggestions on the fiscal front, advocating that provincial governments take the lead. In contrast, the federal government assumes a more accommodating role, focusing primarily on managing debt and defense.

Regarding monetary policy, Dr. Naved Hamid argues that the State Bank initially reacted conservatively during the crisis but is now adopting a stringent monetary stance. He advises cautious deliberation before relaxing current policies.

Dr. Azam Chaudhry's paper provides important insights regarding foreign investment and trade, highlighting that while exchange rates effectively manage imports, they are less effective for boosting exports. He recommends focusing on expanding existing export categories rather than attempting to introduce entirely new products. Additionally, leveraging comparative advantages may help identify productive policy areas for trade growth.

I want to note a key concern. Despite their size and similar challenges, our neighboring countries have managed their economies effectively, keeping minimal exchange rate fluctuations. One practice that stands out is India's requirement that all external borrowings and export proceeds be fully repatriated and convertible. In contrast, Pakistan has historically

allowed more flexibility, which may have unintended negative impacts. Therefore, we should thoroughly examine whether stricter management of foreign borrowings and export proceeds, similar to India's practice, could enhance our economic stability.

By drawing on rigorous analysis and policy experience, this volume seeks to inform both academic discussion and practical policy-making in a moment of economic transition.

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State of the Pakistan Economy Growth, Inflation, Welfare and the Budget : Financial Year 2024

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Abstract

The Lahore School of Economics macro model estimates that Pakistan's GDP growth for FY 2023-2024 is projected at 1.68%, reflecting ongoing weaknesses in sectoral performance, particularly in large-scale manufacturing, which barely broke even after a contraction of -2.9% in FY 2022-2023. In contrast, GDP growth is expected to rise to 3.3% for FY 2024-2025. This low growth trajectory has been corroborated by various institutions, with the GOP estimating 2.4% and the IMF at 2.0%. The report explores the structural hypothesis that Pakistan's GDP growth is constrained by external imbalances, leading to periodic crises and necessitating IMF bailouts. Inflation for FY 2023-2024 is estimated at 18.9%, down from a peak of 33% in FY 2022-2023, primarily driven by a significant depreciation of the exchange rate and a fiscal deficit of 7.4%. The budget for FY 2024-2025 is highly aspirational, increasing from PKR 14.5 trillion to PKR 18.9 trillion, with tax revenues projected to rise from PKR 9.4 trillion to PKR 12.9 trillion. However, reliance on borrowing remains high, comprising over half of the total budget, raising concerns about sustainability. The report emphasizes the necessity for reducing borrowing costs and generating growth while addressing rising poverty levels, which have escalated from 5% in FY 2019-20 to an estimated 18% in FY 2022-23 due to inflationary pressures.

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Introduction

The Lahore School of Economics estimates that Pakistan's GDP growth for FY 2023-2024 will be 1.68%, reflecting ongoing weaknesses in sectoral performance, particularly in large-scale manufacturing, which has barely improved from a contraction of -2.9% in FY 2022-2023. This low estimate aligns with structural hypotheses suggesting that external imbalances constrain GDP growth, leading to periodic crises and necessitating IMF bailouts. Low GDP growth rates below 5% help contain the current account deficit, while higher rates exacerbate it due to elastic imports. The cyclical nature of GDP growth indicates that low-growth phases require reserve accumulation through IMF support, while high-growth phases deplete these reserves. Overall, the report emphasizes the persistent hiatus in GDP growth since FY 2021-2022 and underscores the need to address underlying structural issues to foster sustainable economic recovery.

Inflation for FY 2023-2024 is estimated at 18.9%, by our model. For FY 2022-2023, when inflation peaked at 33%, the overwhelming driver of inflation has been the huge depreciation of the exchange rate, by some 52%, contributing to three quarters of the inflation rate. Over FY 2023-24, depreciation has come down to 12%, contributing just 6.04% to the inflation rate of 18.9%. The second major driver of inflation for FY 2023-2024 has been the fiscal deficit, estimated to be 7.4% over the fiscal year. A significant and increased contributor to inflation over FY 2023-24, has been the change in commodity prices, whose impact on inflation comes in at 5.4%.

The budget for FY 2024-25 is characterized as highly aspirational, increasing from PKR 14.5 trillion in FY 2023-24 to PKR 18.9 trillion. This rise is driven by an ambitious target for tax revenues, projected to grow from PKR 9.4 trillion to PKR 12.9 trillion, representing a PKR 3.6 trillion increase. However, this goal is set against the backdrop of a low-growth economy, with declining investment and increasing capital outflows, particularly as large-scale manufacturing has contracted over the past two years. The reliance on raising tax revenues above 10% of GDP is seen as problematic within the context of an economy struggling to recover.

The budget aims to align revenue scarcity with expenditure needs, as revenues accounted for only 48.2% of the total budget last year, necessitating over half of the budget to be funded through borrowing. This situation is exacerbated by the transfer of most federal revenues to provinces, leaving the federation with just 1% of total revenues and heavily reliant on borrowing to meet expenditure commitments. With expenditures set to rise nearly 30% year-on-year and debt servicing costs consuming a significant portion of the budget, the report highlights the need for reducing borrowing and generating sustainable growth while addressing rising poverty levels through targeted welfare measures.

Therefore, there are two imperatives for the economy.

One, a reduction in borrowing and its costs. Increasing expenditure based on more than half of it coming from borrowing is not sustainable or rational. Therefore, expenditures have to be cut. And the budget deficit lowered.

Two, generating growth. But if significantly increased taxation is a disincentive to growth, then again, expenditures must be lowered, to better match existing taxation, again, requiring the budget deficit to be lowered. If there are some expenditures to be ring-fenced, exigencies of the state come to mind, but so does welfare.

Welfare must to the fore. As a result of the gradual increase in inflation peaking at 33% over FY 2022-2023, incomes have eroded, especially for the lowest deciles of the income distribution. Increasing the poverty headcount from 5% of the population in FY 2019-20 to 9% in FY 2021-22, and then doubling it to 18% in FY 2022-23. We have estimated that the eradication of extreme poverty will require unrequited transfers to the poor, of 10% of revenues. If this is a large ask of a developing economy, a more immediately doable ask can also be estimated. We have estimated that the poor spend a quarter of their caloric basket on wheat and bread. This makes the first step in poverty eradication to spend 2.5% of revenues on provision of free wheat to the means tested poor population.

GDP Growth Estimates for Fiscal Year 2024

The Lahore School of Economics macro model for the Pakistan economy estimates that GDP growth over the Fiscal Year 2023-2024 has been 1.68% (See Table 1). This estimate for the whole FY 2023-2024 is based on observed values for the four quarters (Q1-Q4), of the year.

Table 1: Estimates for GDP Growth Rate FY 2023-2024

	FY 2021-22	FY 2022-23	FY 2023-24	FY 2024-25 (P)
GDP (\$ bn)			346.37	
C (\$ bn)			256.25	
I (\$ bn)			54.81	
G (\$ bn)			36.31	
NX (\$ bn)			-1.0	
Growth Rate (%)	5.05%	0.05%	1.68%	3.34%

Source: Lahore School Modeling Lab Estimates, 2024

Sectoral Growth rates

This low estimate of GDP growth for FY 2023-2024 is based on a sustained weakness in sectoral growth, especially in large scale manufacturing (LSM)—which has barely broken—from the previous year FY 2022-2023 contraction of -2.9% (See Table 2).

Table 2: Sectoral Growth Rates

	FY 2022-2023	FY 2023-2024
Agriculture	1.5%	2.0%*
Industry	-2.90%	0.07%
LSM	-2.90%	0.07%**
Services	0.90%	0.33%*

Source: *LSML estimates, **PBS, GOP (June 2024)

This has been compounded by a weak, below-trend growth in agriculture. The bumper Rabi 2024 wheat crop was expected to boost agricultural growth. However, a 25% collapse in wheat prices for Rabi 2024 compared to Rabi 2023 has lowered the value of marketed output. A policy decision to import wheat, despite the upcoming Rabi harvest due, appears to be a contributing factor.

Trend growth in agriculture over the last six years comes has averaged 2.9% per annum (Economic Survey of Pakistan, 2018-23). However, trend growth in important crops during this period has been significantly lower, at just 1.4% per annum. We estimate that the decline in the value of the Rabi harvest has reduced agricultural growth for FY 2023-2024 to approximate 2%. Consequently, a flatline GDP growth rate for FY 2022-2023 has been succeeded by a very weak GDP growth of 1.68% for FY 2023-2024.

Our GDP growth estimate aligns closely with the GOP's projection of 2.4% for FY 2023-2024 (See Table 3).

Table 3: Comparable Growth Rate Projections FY 2023-2024

Lahore School Modeling Lab (LSML)	1.68%
Government of Pakistan (GOP)	2.40%
International Monetary Fund (IMF)	2.00%
World Bank	1.80%
Asian Development Bank (ADB)	1.90%

Source: GOP (June 2024), IMF (April 2024 World Economic Outlook), World Bank (April 2024), Asian Development Outlook (April. 2024)

The IMF has a slightly higher estimate of 2.0% for FY 2023-2024, compared to ours. The Asian Development Bank and the World Bank also have smidge higher estimates of 1.8% and 1.9%, respectively, for FY 2023-2024.

Why this hiatus in GDP growth?

GDP Growth trends and their correlation to the Current Account

The fundamental question is: why has the hiatus in GDP growth persisted since FY 2021-2022? The trend GDP growth rate in the decade till FY 2021-2022 was 4.04% per

annum, notwithstanding the dip into negative growth of half a percent during the Covid-19 year in 2020.

Table 4: Trend Current Account, Net Reserves, Budget Deficit and GDP Growth Rates

	FY 12-13	FY 13-14	FY 14-15	FY 15-16	FY 16-17	FY 17-18	FY 18-19	FY 19-20	FY 20-21	FY 21-22	FY 22-23	FY 23-24
Total Exports (\$ mil)	32,016	30,931	30,616	28,038	28,614	31,345	30,801	28,452	32,092	40,247	36,124	36,614
Total Imports (\$ mil)	52,604	54,126	55,365	56,075	64,287	74,111	68,993	58,336	67,642	90,385	67,750	65,985
Current Account Balance (\$ mil)	-2,496	-3,130	-2,709	-4,961	-12,270	-19,195	-13,434	-4,449	-2,820	-17,481	-3,275	-1,000
Net Reserves with SBP (\$ mil)	6,008	9,033	13,088	16,819	16,144	9,789	7,285	11,231	16,119	9,814	4,445	9,385
Budget Deficit (%)	8.2	5.5	5.3	4.1	5.2	5.8	7.9	7.1	6.1	7.9	7.7	6.0
GDP Growth (%)	3.99	4.05	4.06	4.56	5.22	5.53	2.08	-0.47	3.94	5.05	0.05	1.68

Source: State Bank of Pakistan, 2024

There are two hypotheses for its causality.

The neoclassical/IMF hypothesis does not directly address GDP growth; instead it explains external imbalances in the Current Account as a result of domestic imbalances between savings and investment. Mahmood and Chaudhry (2024) argue that the causality extends beyond domestic imbalances, to include a significant imbalance between the rigidity of exports and the elasticity of imports concerning GDP growth.

In contrast, the structural hypothesis proposed by Chaudhry, ADB (2009), and Amjad & Shahzad (2019), directly addresses GDP growth and focuses on external imbalances. This hypothesis posits that while exports are highly inelastic with respect to GDP growth, imports are extremely elastic. It posits a tipping point approximating 5% GDP growth, beyond which imports increase dramatically, leading to an unsustainable Current Account balance.

Table 4 examines the hypotheses proposed by Chaudhry, ADB (2009) and Amjad & Shahzad (2019), generalizing that Pakistan's GDP growth is primarily constrained by imports. The LSM sector, along with agriculture, exhibits high import coefficients, indicating that Pakistan's GDP growth is better explained by external imbalances which lead to periodic crises. This necessitates recourse to IMF bailouts, suggesting that GDP growth is not primarily driven by domestic imbalances in resource allocation and efficiency.

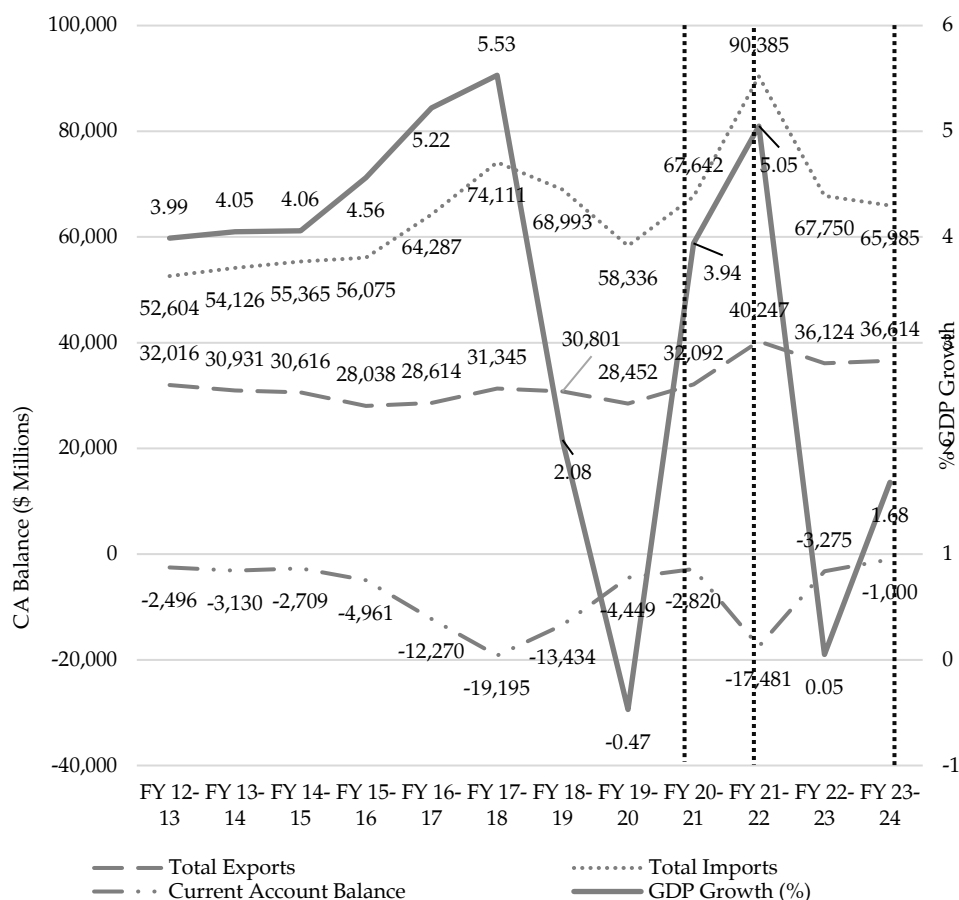
Examining GDP growth from FY 2012-2013 to FY 2023-2024, Figure 1 illustrates that GDP growth varied between 4% per annum and 4.6% per annum from FY 2012-

2013 to FY 2015-2016. During this period, the Current Account deficit ranged from \$2.5 bn and \$5 bn. Although exports remained sluggish, ranging between \$28 bn and \$32 bn, imports also stayed within a relatively low band of US\$52 billion to US\$56 billion. So, these four years can be characterized as a relatively lower GDP growth phase.

For the next two years, FY 2016-2017 and FY 2017-2018, GDP growth in Pakistan rose above 5% per annum, ranging between 5.2% and 5.5%. During this period, the Current Account deficit ballooned, more than doubling from its preceding base of US\$5 billion to US\$12 bn in FY 2016-2017, and then increasing further to US\$19 billion in FY 2017-2018. This ballooning of the Current Account deficit was not driven by exports, which remained stagnant within the same range of \$28 billion to \$32 billion as in the previous lower GDP growth phase. Instead, the increase was primarily due to imports, which surged from US\$56 billion to \$64 bn in FY 2016-2017, and then to US\$74 billion in FY 2017-2018. Thus, this higher GDP growth phase, is characterized by sluggish exports but highly elastic imports relative to GDP.

For the next three years, from FY 2018-2019 to FY 2020-2021, GDP growth declined to 2.1% in FY 2018-2019, contracted to -0.5% in FY 2019-2020 due to COVID-19, and recovered to 4% in FY 2020-2021. During this lower GDP growth phase, the Current Account deficit also came off the boil, dropping from a previous high of US\$19 billion in FY 2017-18 to US\$13 billion in FY 2018-19, and then further to a low of US\$4 billion in FY 2019-2020 and US\$2.8 billion in FY 2020-2021. Sluggish exports, still ranging between US\$28 billion and US\$32 billion, did not influence the Current Account deficit, but reduced GDP growth lowered imports from a peak of US\$74 billion in FY 2017-2018 to US\$68 billion in FY 2018-2019 and US\$58 billion in FY 2019-2020.

Figure 1: GDP Growth, Imports, Exports and CA Balance



Source: State Bank of Pakistan, 2024

The second phase of lower GDP growth (below 5%) was characterized again by sluggish exports, but very elastic imports with respect to GDP. In the following fiscal year, FY 2021-22, GDP growth rebounded slightly to 5.1%. However, during this period of higher growth, the Current Account deficit surged unprecedentedly from the previous year's low of US\$3 billion (FY 2020-21) to US\$17 billion (FY 2021-22), a sixfold increase. Although exports rose to US\$40 billion in FY 2021-22, this increase was insufficient to significantly mitigate the CA deficit. The primary driver behind the widening deficit was again the imports, which escalated from US\$67 billion in FY 2020-21 to US\$90 billion in FY 2021-22. Therefore, this second phase of high GDP growth was again characterized by relatively sluggish exports, while imports remained highly elastic with respect to GDP.

In summary, over the last decade leading up to FY 2021-2022, low GDP growth of below 5% kept a lid on the CA deficit. Conversely, high GDP growth, above 5% blew up the CA deficit, which cannot be well explained by sluggish exports, but imports, which are observed to be very elastic with respect to GDP. Imports tend to surge sharply as the GDP growth rate exceeds 5% and moderate when GDP growth falls below this threshold, bringing us to the current hiatus in GDP growth observed since FY 2021-2022.

Import dependence of GDP growth

With imports being highly elastic with respect to GDP growth, the relationship between them should not be viewed as a one-way street, where imports function solely as a response to GDP and where GDP growth exceeding 5% leads to surging imports. Instead, the causal relationship between imports and GDP growth must be viewed the other way around, with GDP growth as a function of imports. Certainly, in the case of Pakistan, GDP growth is heavily dependent on imports. We have estimated this coefficient of import dependence in production. The production of all goods in the economy requires capital goods (K goods), and intermediate goods such as energy and raw materials (I goods) as illustrated in Table 5. Consequently, K goods and I goods, can be grouped together as essential inputs needed for the production of other goods, as opposed to consumer goods (C goods).

Table 5: Imports Decomposition

FY 2022-2023	PKR (000s)	%
Total Import Payments	12,557,604,901	100%
I Goods	7,682,611,028	61%
Fuels	4,555,588,842	36%
K Goods	1,340,638,187	11%
C Goods	3,534,355,688	28%

Source: State Bank of Pakistan, 2023 & 2024

Imports into the economy can be classified as K goods and I goods, which are necessary for production, as well as C goods, which are consumed directly by consumers. The import dependence of production can be estimated as the sum of K goods and I goods imported, resulting in a high figure of 72%, as shown in Table 5.

The high import elasticity of GDP growth, along with the significant import dependence of production, permits sustained GDP growth only under two conditions:

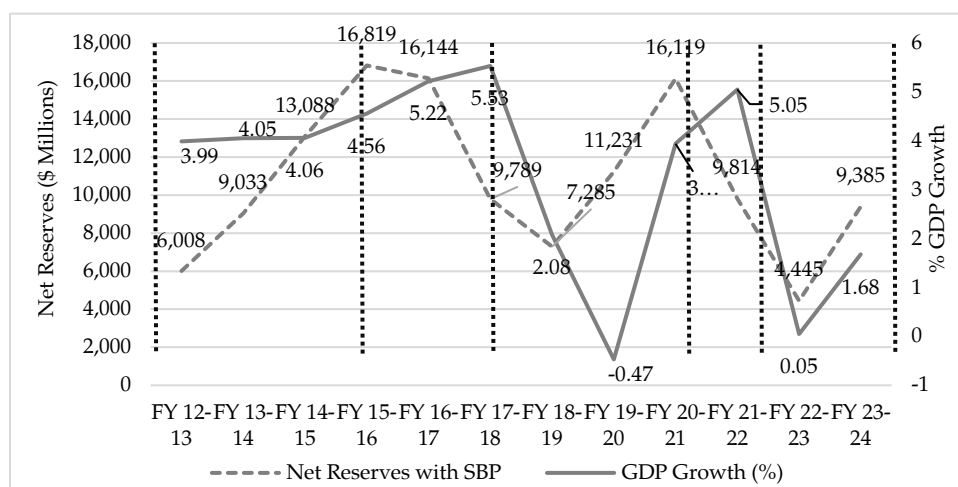
First, exports must match imports, ensuring that the CA is balanced or positive. However, as observed, this is not the case for Pakistan which runs a chronic CA deficit that ranges between \$2 bn and \$5 bn when GDP growth is below 5%. In

contrast, this deficit balloons to between US\$12 billion and US\$19 billion, when GDP growth rises above 5%.

Second, given the persistent deficits in the Current Account, and their expansion with high GDP growth above 5%, such growth based on high import dependence must be financed through the reserves held by the State Bank of Pakistan.

Figure 2 shows that each phase of low GDP growth, FY 2012-2013 to FY 2015-2016 in the first low GDP growth phase, and FY 2018-2019 to FY 2020-2021 in the second low GDP growth phase, is based on depleted reserves being built up. In the first low GDP growth phase, reserves rise from US\$6 billion to US\$17 billion. In the second low GDP growth phase, reserves rise from US\$7 billion to US\$16 billion again. These reserves were primarily built up by recourse to lending from the IMF. The first low GDP growth phase largely coincides with the 22nd EFF (FY 2014 to FY2017) with the IMF. The second low GDP growth phase largely coincides with the 23rd EFF (FY FY2019 to FY2022).

Figure 2: GDP Growth and Net Reserves



Source: State Bank of Pakistan, 2024

Each low GDP growth phase—having built up reserves—enabling a brief subsequent period of high GDP growth above 5%. This growth depletes accumulated reserves, necessitating another low-growth phase to rebuild reserves through IMF borrowing programs.

As Figure 1 shows, the first low growth phase from (FY2013-FY2017) saw reserves rise to US\$16 billion , permitting a brief high-growth phase (FY 2016-2018)

that reduced reserves to US\$9 billion. Similarly, the second low-growth phase (FY2019-FY2021) rebuilt reserves to US\$16 billion, enabling a brief high-growth period in FY 2021-2022 that again depleted inherited reserves to US\$9 billion.

This cyclicalities arises from Pakistan's structural dependence on imported capital (K goods) and intermediate goods (I goods), which create high import elasticity relative to GDP growth. Chronic CA deficits—ranging from US\$2–5 billion during low-growth periods to US\$12–19 billion during high-growth phases—make short run GDP growth a function of reserves and force reliance on IMF programs. This leads to perpetuating alternating phases of prolonged low growth and unsustainable high growth.

Making short run GDP growth a function of reserves

Therefore finally, three conditions make short run GDP growth a function of reserves.

- a) A high elasticity of imports with respect to GDP; based on,
- b) A high coefficient of imports of K goods and I goods needed for production of output; combined with,
- c) Chronic Current Account deficits.

This makes short run GDP growth a function of reserves, with successive cyclicalities between low growth and high growth phases, explaining the current hiatus in GDP growth. Table 4 shows that the last high GDP growth phase of 5.1% in FY 2021-2022, was based on a buildup of inherited reserves of \$16 bn. The brief high plunged reserves down to \$9 bn. The succeeding FY 2022-2023 saw reserves plunge to their lowest level in a decade to US\$4 billion. During this time, GDP growth flatlined according to all estimates, including ours, those from the Government of Pakistan (GOP), and other comparators.

A short Stand-By Agreement with the IMF has enabled a buildup of reserves to US\$9 billion for FY 2022-23. However, this has only allowed for a modest pickup in GDP growth, estimated at 1.68% over FY 2023-24. Consultations with the interim Finance Minister in early 2023 confirm reserves as the primary constraint on production. In that year, with reserves at a critically low level of US\$3 billion, Letters of Credit for imports had to be restricted, as allowing all applications could have resulted in a hemorrhaging of these last US\$3 billion. The criticality of reserves for raising GDP growth underscores new Finance Minister's policy to seek another borrowing program from the IMF a *sin qua non*. The recently signed 24th EFF of US\$7 billion with the Fund, should enable this. Our model projects that GDP growth accordingly should rise to 3.3% for FY 2024-25 (see Table 1).

Policy to raise GDP growth and dampen short run cyclicalilty

Short run GDP growth and its pronounced cyclicalilty are observed to be functions of reserves, predicated on three conditions: a high elasticity of imports with respect to GDP growth, a high coefficient of import of K and I goods for production, and the presence of chronic Current Account deficits that persist even during low GDP growth but balloon during high GDP growth phases exceeding 5%.

The fulcrum of these three conditions is the middle condition, which indicates a high coefficient of imports of K and I goods for production of output, calculated at 72%. Consequently, any constraint on the import of K or I goods will adversely affect production output and its growth over time. Therefore, it is essential to liberalize import of K and I goods as reserves build up.

The economy imports another 28% of C goods, as shown in Table 5. These goods are not necessary for increasing output or its growth over time.; therefore, imposing constraints on the import of C goods should not adversely affect output or its growth over time. Consequently, a five-year growth strategy could be based on completely eliminating the import of C goods. This will achieve two objectives: it would free up 28% of reserves for the import of K and C goods, and it would create a domestic market for C goods through import substitution, encouraging local investment. Both of these factors should enable a higher GDP growth rate for a given level of reserves while also dampening the short run cyclicalilty in GDP growth.

A longer-term strategy could mirror the import substitution approach for C goods by focusing on I goods where possible, over the next ten years, followed by K goods over the subsequent fifteen years. This would provide a comprehensive long-term perspective plan spanning the next thirty years.

Inflation Estimates

Inflation for FY 2023-2024, is estimated at 18.9% by our model, as shown in Table 6.

Table 6: Price Model Estimations from FY 2019- FY 2024

Time Period	Output Gap	Budget Deficit	Exchange Rate Depreciation	Commodity Prices	Inflation (Model Est.)	Inflation (GoP Est.)	Inflation (IMF Est.)
	(% of GDP)	(% of GDP)	%	Impact on $\dot{P}$	%	%	%
FY 2019-20	-1.70	6.40	0.88	-2.00	5.28	9.30	9.30
FY 2020-21	-1.80	5.20	-0.78	9.07	13.49	8.20	8.20
FY 2021-22	0	7.00	3.59	7.69	15.88	11.00	11.00

Time Period	Output Gap	Budget Deficit	Exchange Rate Depreciation	Commodity Prices	Inflation (Model Est.)	Inflation (GoP Est.)	Inflation (IMF Est.)
FY 2022-23	0	5.00	26.26	2.04	33.30	29.0	29.0
FY 2023-24	0	7.5	6.04	5.39	18.9	23.41*	24.8
						12.57**	

Source: Ministry of Finance (June 2024), IMF (Feb 2024 World Economic Outlook Update)

*Average for FY 23-24

**Year on Year Change (June 2023- June 2024)

Our estimate of inflation at 18.9% for FY 2023-2024, lies midway between GOP's two estimates of average inflation for FY 2023-24, which are 23.4% and a year-on-year change of 12.6% (June 2023- June 2024). The year-on-year change indicates that inflation indeed has indeed moderated over the course of this fiscal year. Our model estimates inflation identifies four causal factors:

- An output gap,
- A budget deficit,
- Depreciation of the exchange rate,
- Global commodity prices.

For FY 2022-2023, when inflation peaked at 33%, the primary driver was the significant depreciation of the exchange rate, which fell by approximately 52%, contributing to three-quarters of the inflation rate, as shown in Table 6.

Over FY 2023-2024, depreciation has decreased to 12%, contributing only 6% to the overall inflation rate of 18.9%. The second major driver of inflation for this fiscal year has been the fiscal deficit, which is estimated at 7.5%. Additionally, a significant contributor to inflation has been the change in commodity prices, particularly energy prices, which have impacted inflation by 5.4%.

The output gap has exerted a disinflationary effect over the previous three fiscal years due to the Covid-19 pandemic lockdowns. However, post-pandemic, this output gap is estimated to have a neutral impact on inflation, neither disinflationary nor inflationary in nature.

The significance of the increase in energy prices on inflation

The most interesting variable to emerge from this report's estimation and analysis of inflation is energy prices. While the other major contributors to inflation—depreciation of the exchange rate, and the fiscal deficit—are larger than the variable of change in energy prices, both depreciation and the deficit lead to an increase in inflation almost inadvertently. The express aim of GOP is not to increase the price

level in the economy by allowing depreciation of the exchange rate, nor is it to increase the price level by running a budget deficit.

In contrast, the variable of change in energy prices, is distinct from these other major contributors. In the variable of change in energy prices, GOP is seen to actively raise energy prices as a stated policy. While some of these increases may be necessary to cover rising producer costs, our estimates indicate that a much larger part of the increase in energy prices is based on increased taxation. Thus, GOP's policy of reducing revenue shortfalls through increased energy taxation contributes significantly to inflation.

This report seeks to quantify the increase in consumer price of six main sources of energy and decompose this increase into the share attributed to producer prices and the share resulting from increased taxation. The six main sources of energy, whose consumer prices have increased over FY 2023-2024 are petrol, kerosene, high-speed diesel (HSD), electricity, coal, and natural gas.

This increase in energy prices for end consumers, whether households or firms, will have two significant effects.

First, the increase in energy prices for consumers will raise the cost of living, contributing directly to inflation.

Second, the increase in energy prices for firms—whether employers or sole producers of goods and services—will raise their production costs, creating a secondary multiplier effect on inflation as these increased costs are passed through to higher prices for goods and services produced.

This report estimates only the first direct effect of increase in energy prices on inflation, leaving the estimation of the secondary multiplier effect on inflation to follow.

Derivation of increase in energy prices

Table 7 estimates the change in consumer prices, for the six main sources of energy with publicly available data. The change reflects the nominal price per unit of energy for the consumer, averaged to account for variations in unit prices based on consumption levels.

**Table 7: Increase in Energy Prices
(unweighted % change) (June 2023 to June 2024)**

	Δ Supplier Price	Δ Taxation	Δ Consumer Price
Natural Gas	103%	183.27%	134%
Electricity	52.99%	127.17%	93.19%
Coal	20%	0%	20%
Petrol	8%	20%	10%
HSD	2.73%	12.43%	6%
Kerosene	3.84%	33.27%	4.71%
Unweighted Average	32%	63%	45%

Source: Lahore School Modeling Lab estimates, 2024

Note: The price increase for each category is given for the change during the time period between t_0 and t_1 , t_0 being June 2023 and t_1 being June 2024, except for Natural gas where t_0 is Jan, 2023 and t_1 is Feb 2024 and Petrol where t_1 is May, 2024.

The average price of electricity per unit has increased by 93% over FY 2023-2024. This rise in the nominal price for consumers attributed to two factors: an increase in the nominal price charged by suppliers and an increase in the nominal rupee value of the tax charged by GOP. Table 7 shows that the price of natural gas has risen by 134% over FY 2023-2024, with the supplier's price increasing by 103% and GOP's tax rising by 183.3%. The price of electricity for consumers went up by 93%, with the supplier price rising by 53% and GOP's tax increasing by 127%.

The price of coal has gone up by 20% over FY 2023-2024, with the supplier price rising by 20% while GOP's tax remained constant.

The price of petrol for consumers increased by 10% over FY 2023-24, with the supplier price rising by 8% and GOP's tax went up by 20%.

The price of High-Speed Diesel (HSD) increased by 6% over FY 2023-24, with the supplier price rising by 2.73% and GOP's tax increasing by 12.43%.

The price of kerosene went up by 4.71% over FY 2023-24, based on a suppliers' price increase of 3.84% and a GOP tax increase of 33.27%.

In terms of the nominal prices charged to consumers, the average price across these six sources of energy has risen by 45%. On average, GOP's tax has increased by 63% over the past year, while supplier prices have risen only by 32%.

While GOP is sovereign in its decision to raise revenues through ad valorem taxes on goods and income taxes to plug its deficits, it is important to note that these ad valorem taxes significantly raise consumer prices more than suppliers' prices. Additionally, ad valorem taxes are regressive, particularly for energy sources like petrol and high-speed diesel, where low-income consumers cannot be adequately protected.

Derivation of weighted increases in energy prices to determine impact on inflation

Nominal price increases in the six main sources of energy directly impact consumers and consequently, inflation. However, consumer reliance on these energy sources varies. Therefore, the impact of these nominal price increases is weighted by this reliance to determine the proportionate impact on inflation.

Furthermore, energy constitutes only a part of the consumer basket of goods used to calculate the Consumer Price Index for estimating inflation. This coefficient of energy share is applied to the weighted price increases to determine the energy impact on inflation of 5.4% (See Table 5).

The weighted increase in energy prices for consumers is presented in Table 8, decomposed into the share of this increase from suppliers' price and the share from GOP's tax.

Table 8: Increase in Energy Prices
(weighted % change) (June 2023 to July 2024)

	ΔSupplier Price	ΔTaxation	ΔConsumer Price
Natural Gas	19.45%	22.18%	41.64%
Electricity	4.13%	11.72%	15.84%
Coal	3.8%	0.00%	3.8%
Petrol	0.53%	0.32%	0.85%
HSD	0.19%	0.43%	0.62%
Kerosene	0.04%	0.01%	0.05%
Weighted Average	4.69%	5.78%	10.47%

Source: Lahore School Modeling Lab Estimates, 2023 & 2024

A 0.85% increase in consumer price for petrol was observed from June 2023 to June 2024, with 0.53% attributed to suppliers' price and 0.32% to GOP's tax. Kerosene's weighted consumer price rose marginally by 0.05%, while coal saw a 3.8% increase entirely by suppliers' price. High Speed Diesel (HSD) experienced a 0.62% weighted consumer price increase, comprising 0.19% from suppliers' price and 0.43% from GOP's tax. Natural gas recorded the highest weighted price rise at 41.64%, with 19.45% from suppliers' price and 22.18% from GOP's tax.

The weighted average increase in consumer prices across all six energy sources rose by 10.47% over FY 2023-2024. Of this total, 4.69 percentage points stemmed from supplier's price increases while 5.78% from GOP's tax.

While GOP's revenue raising efforts through ad valorem taxation cover a yawning fiscal deficit, they have proven inflationary and regressive in the case of petrol, which has a uniform tariff. However, these tariffs have been observed to be progressive with use, for natural gas and electricity.

Welfare

The gradual increase in inflation peaking at 33% over FY 2022-2023, has eroded incomes, particularly for the lowest deciles of income distribution. As a result, the poverty headcount, which had decreased to approximate 5% of the population of the country by FY 2019-2020, has climbed since. By FY 2021-22, poverty rose to 9% of the population and the surge in inflation over FY 2022-2023 doubled this figure to 18%. Table 9 estimates the transfers needed to eradicate poverty completely. With a poverty rate of 5%, these transfers would amount to just 3% of annual revenues. However, with an 18% poverty rate, the required transfers have risen to 10% of annual revenues.

Table 9: Poverty Run FY 2023-2024 (Extreme Poverty \$1.90)

Time Period	Total Shock (p-Y) %	Poverty Line* (PKR)	Poverty Headcount (%)	Population to Sample Ratio	Pov. Gap Sample (PKR)	Pov. Gap (Pop.) Daily Transfer (PKR 000s)	Annual Transfer (PKR mil)	Tax Value (PKR bil)	% of Tax Value (%)
FY 2017-18	-	211.0	4.47	1,320.2	246,599	325,568	118,832	5,200	2.29
FY 2018-19	-1.75	214.7	4.76	1,320.2	268,504	354,487	129,388	4,900	2.64
FY 2019-20	5.65	226.8	5.97	1,320.2	370,605	489,285	178,589	6,270	2.85
FY 2020-21	3.85	235.6	7.16	1,320.2	465,011	613,924	224,082	6,900	2.80
FY 2021-22	7.15	252.4	9.49	1,320.2	689,129	909,809	332,080	8,000	5.44
FY 2022-23	23.15	310.8	18.73	1,320.2	1,976,326	2,609,208	952,361	9,600	9.92

Source: Pakistan Bureau of Statistics, 2019-2024 & Ministry of Finance, 2019-2024

*Lahore School Modeling Lab Estimations: Poverty line reflects the per adult equivalent per day

The total transfers needed to eradicate poverty, while aspirational, demand urgent policy action. There has been some policy discussion about lowering the price of wheat as a welfare measure to make it more affordable, especially for the poor. The problem with such a policy is that it lowers agricultural output and incomes, as estimated above in this report.

A more comprehensive growth cum welfare policy would involve supporting the price of wheat to ensure growth in agricultural output and incomes, while simultaneously providing free wheat to the means tested poor population. Fatima (2025) estimates that the consumption basket of the poor comprises 25% of expenditure on wheat and bread, which is essential for them to just climb over the poverty line. Therefore, if 10% of annual revenue is needed to eradicate poverty completely, then 25% of this 10% will be required to provide free wheat to this poor population, resulting in an estimate of 2.5% of annual revenue needed to provide

free wheat to the means tested poor population, making a substantive and necessary contribution to welfare.

The Budget for FY 2024-2025

The Budget for FY 2024-2025 (see Table 10) is a highly aspirational budget. The budget rises from PKR 14.5 trillion last fiscal year FY 2023-2024 to PKR 18.9 trillion this fiscal year—an ambitious increase in tax revenues of PKR 3.6 trillion—since tax revenues are projected to rise from PKR 9.4 trillion to PKR 12.9 trillion this year.

Table 10: Budget Comparison FY 2023-24 and FY 2024-25

	FY 2023-2024		FY 2024-2025	
	PKR (bn)	Budget Spent (%)	PKR (bn)	Budget Spent (%)
Total Resources (I+II+III+IV+V)	14,484	100.00%	18,877	100.00%
1. Tax Revenue (FBR) - Federal Consolidated Fund	9,415		12,970	
2. Non-Tax Revenue	2,963		4,845	
a) Gross Revenue Receipts (1+2)	12,378		17,815	
b) Provincial Share (Nominal Value)	5,399		7,438	
Total Borrowing (II+III+IV+V)	7,505	51.82%	8,500	45.03%
I. Net Revenue Receipts (a-b)	6,979	48.18%	10,377	54.97%
II. Non-Bank Borrowing (NSSs & Others) - Public Account	1,906	13.16%	2,662	14.10%
III. Net External Receipts - Fed. Consolidated Fund	2,724	18.81%	666	3.53%
"IV. Bank Borrowing (T-Bills, PIBs, Sukuk) - Fed. Consolidated Fund"	2,860	19.75%	5,142	27.24%
V. Privatization Proceeds - Fed. Consolidated Fund	150.16%	0.10%	30	
Total Expenditure	14,484	100.00%	18,877	100.00%
A. Current	13,344	92.13%	17,203	91.13%
Interest Payments	7,303	54.73%	9,775	56.82%
Grants & Transfers to Provinces	1,408	10.55%	1,777	10.33%
Defence Affairs & Services	1,804	13.52%	2,122	12.34%
Pension	801	6.00%	1,014	5.89%
Subsidies	1,064	7.97%	1,363	7.92%
Running of Civil Govt	714	5.35%	839	4.88%
Provision for Emergency and others	250	1.87%	313	1.82%
B. Development & Net Lending	1,140	7.87%	1,674	8.87%
Federal PSDP	950	83.33%	1,400	83.63%
Net Lending	190	16.67%	274	16.37%

Source: Ministry of Finance, 2024

The budget seeks to match the scarcity of revenues to the exigencies of expenditures.

Revenues

Revenues last fiscal year comprised only 48.2% of the total budget, necessitating reliance on borrowing to comprise more than half, at 51.8%. The ambitious revenue target for FY 2024-2025, set at 55% of the total budget, aims to reduce this reliance on borrowing to 45%.

The high reliance on borrowing is largely necessitated by the federation's revenues being almost entirely transferred to the provinces. These provincial transfers consistently account for 47% of the total budget, slightly less than revenues at 48% of the total budget. This leaves the federation with only 1% of the revenues from the total budget, making it entirely dependent on borrowing to meet its considerable expenditure commitments.

The primary source of this borrowing last fiscal year was domestic bank borrowing, which accounted for 19.8% of the total budget. This reliance on domestic non-bank borrowing is expected to increase to 27% of the total budget this fiscal year. The increased reliance on domestic bank borrowing allows foreign borrowing to decrease from 18.8% of the total budget last fiscal year to 3.5% this fiscal year. Reliance on domestic non-bank borrowing remains relatively constant at approximately 14% of the total budget.

Expenditures

Expenditures—which determine the size of the total budget—rise from PKR 14.5 trillion last fiscal year, to PKR 18.9 trillion this fiscal year, reflecting a nearly 30% year-on-year increase. Given the reliance on borrowing, this significant increase in expenditures is profligate.

Current expenditure continues to dominate the total budget, accounting for 92%, with little change from the previous fiscal year. This dominance allows for crowding out development expenditure, with the proposed allocation for the PSDP in FY 2024-2025 set at only PKR 1.4trillion.

The largest ticket item on current expenditure remains debt repayment, which has risen from 54.8% of total expenditures last fiscal year to 56.8% this fiscal year. Other current expenditures for this fiscal year include defense at 12.3%, provincial grants at 10.3%, subsidies at approximately 8%, pensions at around 6%, and administration at roughly 5%, all showing minimal variation compared to the fiscal year.

Three burdens of the new budget

The new budget brings three heavy burdens with it: the burden of additional taxes, the burden of foreign debt servicing and the burden of abiding and increasing subsidies, that do not go to welfare.

The Burden of Additional Taxes

The proposed increase in tax revenue of PKR 3.6 trillion between FY 2023-2024 and FY 2024-2025 (see Table 11) relies on an increase in direct taxes of PKR 1.3 trillion and indirect taxes of PKR 2.3 trillion. The increase in direct taxes is entirely due to a PKR 1.2 trillion increase in income taxes. Unfortunately, the incremental incidence of the tax across income groups is regressive.

The increase in indirect taxes is primarily reliant on a PKR 1.5 trillion increase in sales tax. Indirect taxes are inherently regressive in their impact across income groups. Additionally, critical goods affecting welfare, such as pharmaceuticals, medical supplies, agricultural produce, school books and stationery, are set to be newly taxed, while the level of the General Sales Tax (GST) is set to rise from 17% to 18%.

Table 11: Tax Revenue Comparator

Classification (Rs in Million)	Budget 2023-24	Budget 2024-25
FBR TAXES (I + II)	9,252,000	12,970,000
I. Direct Taxes	3,721,000	5,512,000
Income Tax	3,681,888	5,454,062
Capital Value Tax	10,573	15,662
Workers Welfare Fund	11,231	16,637
Workers' Profit Participation Fund	17,308	25,639
II. Indirect Taxes	5,531,000	7,458,000
Customs Duties	1,324,000	1,591,000
Sales Tax	3,607,000	4,919,000
Federal Excise	600,000	948,000

Source: Ministry of Finance, 2024

The Burden of Foreign debt servicing

Foreign debt servicing due over the next FY 2024-2025 comes to PKR 5 trillion, (see Table 12), which amounts to US\$18 billion at the current exchange rate. Another estimate of debt maturing to be repaid over FY 2024-2025 comes in at US\$20 billion (Ministry of Finance, 2024).

Table 12: Net External Receipts Decomposition

Classification (Rs in Million)	Budget 2023-24	Budget 2024-25
External Receipts	5,053,335	5,685,801
Foreign Loans and Repayment (-)	2,382,222	4,989,963
Repayment of Short-Term Credits (-)	47,875	29,500
External Resources (Net)	2,623,238	666,338

Source: Ministry of Finance, 2024

The Burden of Subsidies

Subsidies came in at PKR 1 trillion in the last FY 2023-2024 (see Table 13), which have increased to PKR 1.4 trillion for FY 2024-2025, a significant increase of 40%.

Table 13: Subsidies

Classification (Rs in Million)	Budget 2023-24	Budget 2024-25
Subsidy to Power Sector (WAPDA/PEPCO/KESC)	584,000	1,190,000
Subsidy to Petroleum	50,600	18,400
Subsidy to Food (PASSCO)	10,000	12,000
Subsidy to PASSCO for Wheat Reserve Stock	8,500	8,000
Subsidy to PASSCO on Account of Cost	1,500	4,000
Differential for Sale of Wheat		
Subsidy to Industries & Production	60,000	68,000
Others Subsidies	366,400	75,012
Wheat Subsidy to GB	16,568	15,872
Total Subsidies	1,071,000	1,363,412

Source: Ministry of Finance, 2024

The entire increase in subsidies is accounted for, by the subsidy increase for the power sector, principally WAPDA, PEPCO, and KESC. This subsidy was Rs. 0.6tr in the last fiscal year. It is projected to more than double to Rs. 1.2tr over the next fiscal year. Accounting for an overwhelming 87% of total subsidies.

Other subsidies constitute insignificant amounts, such as those for Utility Stores, Housing Finance Mera Ghar, and PASSCO for wheat storage. The only food subsidies for consumers are minimal, with PKR 15 billion allocated for wheat for Gilgit-Baltistan, and PKR 4 billion for PASSCO's cost differential in selling wheat.

As such, these persistent and increasing subsidies do not contribute to improving welfare and instead constitute a burden.

Policy on the exigencies of the budget

The new budget for FY 2024-25 increases expenditure primarily by increasing borrowing and the burden of taxes.

Increasing expenditure through borrowing exacerbates repayments, which now account for 57% of total expenditures. This policy is unsustainable and profligate and this perverse gordian knot will have to be cut.

The exigency of increasing the tax take above 10% of GDP has been accepted without economic debate or consideration of the broader context. The economy remains trapped in a cycle of low growth trap, with declining investment, and increasing capital outflows, contraction in Large Scale Manufacturing over the past two years, and reliance solely on agriculture. Increasing the tax take will not reverse this low-growth trap and reflects irrational pricing policy in a market economy.

Two imperatives emerge for addressing these challenges. First, borrowing and its associated costs must be reduced. Increasing expenditure based on borrowing that constitutes more than half of the budget is neither sustainable nor rational, necessitating expenditure cuts and lowering the budget deficit.

Second, generating growth must be prioritized. If significantly increased taxation acts as a disincentive to growth, then again, expenditures must again be lowered to better align with existing taxation levels, further requiring a reduction in the budget deficit.

Certain expenditures may need to be ring-fenced for state exigencies and welfare priorities. Welfare must take precedence. Estimates suggest that eradicating extreme poverty would require unrequited transfers to the poor, amounting to 10% of revenues. While this may be a substantial ask of a developing economy, an immediate step could involve allocating 2.5% of revenues to provide free wheat to the means-tested poor population, addressing their caloric needs and making a substantive contribution to welfare.

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2

The Role of Monetary Policy in the Current Environment: Myths and Reflections¹

Naved Hamid² and Murtaza Syed³

Abstract

In 2023, Pakistan experienced arguably its worst-ever period of stagflation, with growth plummeting and inflation close to all-time highs. In response, monetary policy was tightened considerably, with the policy rate raised to 22 percent and held at that level for one year. This policy was criticized by many in the media. This paper attempts to draw lessons from this episode. It reviews the literature and international experience to evaluate the underlying basis of the criticism. It finds that much of the criticism is based on myths that either reflect outdated thinking or have no empirical basis. Nevertheless, some of the criticism is worth engaging with. Together with the findings of the review, these more informed critiques provide useful guidance for appropriate monetary policy settings under different economic environments. The paper concludes with a discussion of what this guidance could imply for monetary policy settings as the economy stabilizes and inflation comes down.

1. Introduction

The year 2023 marked a significant economic crisis for Pakistan⁴. Growth plummeted to 0.3 percent, while average headline inflation soared to 29.2 percent—both approaching historical extremes. In response to rising inflation, the Monetary Policy Committee (MPC) of the State Bank of Pakistan (SBP) raised the

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⁴ Here, by year 2023 the reference is to Fiscal Year 2023, i.e., from July 1, 2022 to June 30, 2023.

policy rate by 850 basis points to 22 percent and then maintained it at that level for twelve months. This policy garnered considerable criticism in the media.

In this policy paper, we begin with a recap of the severe economic crisis Pakistan faced in 2023. Our review discusses the main factors that contributed to the crisis and the ensuing policy response, notably fiscal and monetary tightening, which contributed to the stabilization of the economy in 2024. Next, we engage with the main criticisms leveled at the monetary policy response, based on a review of the literature and international experience. We characterize much of this criticism as ‘popular myths’ because we find that it is either based on outdated thinking or lacks empirical support.

Concurrently, however, certain critiques do offer valuable insights. Coupled with the findings of our review, these more informed analyses provide useful guidance for appropriate monetary policy settings under different economic circumstances. Accordingly, we conclude with reflections regarding the adjustments in monetary policy settings that could be warranted as the economy stabilizes and inflation recedes.

2. Recent Economic Developments

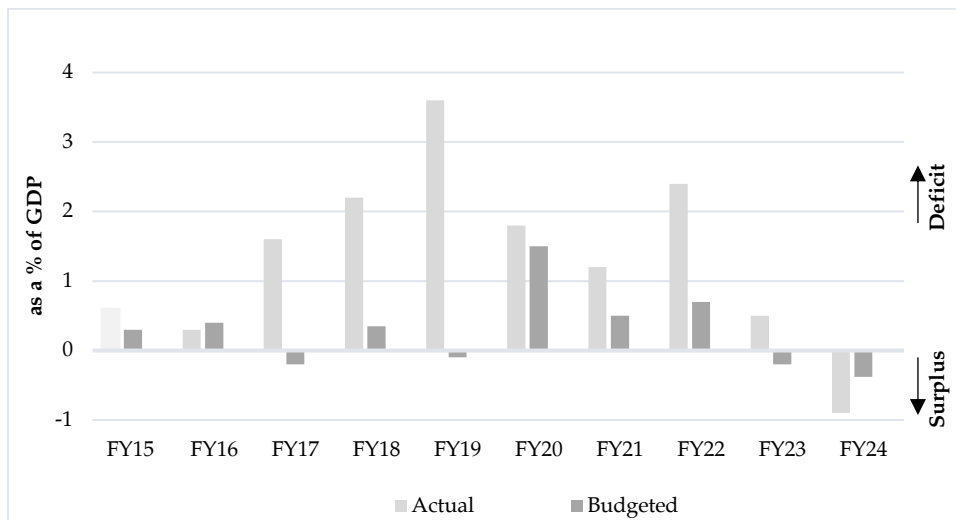
The Great Unraveling of 2023⁵

In Fiscal Year (FY) 2022, following two years of fiscal consolidation, the government adopted an unbudgeted expansionary fiscal stance. This policy reversed prior consolidation gains and contributed to an overheating of the economy.

Consequently, the fiscal deficit increased to 7.9 percent of GDP, from 6.1 percent the previous year. The primary deficit doubled from 1.2 to 2.4 percent of GDP, contrasting sharply with the budgeted fiscal consolidation of 0.7 percent of GDP (see Figure 1).

⁵ See Syed and Hamid (2024) for a more detailed discussion of the events leading up to the crisis of 2023 and the role that monetary policy attempted to play to stabilize the situation.

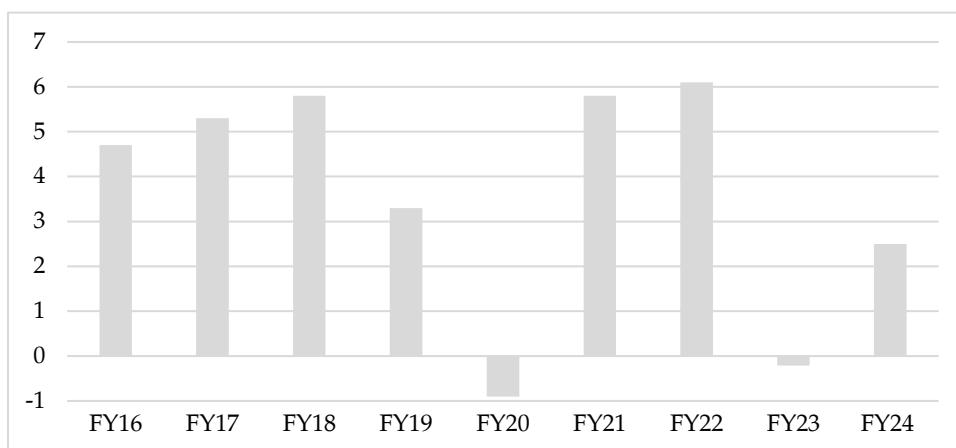
Figure 1: Pakistan's Primary Deficits (Actual vs Budgeted Estimates)



Source: State Bank of Pakistan and Ministry of Finance

Simultaneously, monetary policy settings were accommodative, predicated on the assumption of fiscal consolidation. However, this did not materialize. Instead, growth which had rebounded from the COVID-19 recession to 5.7 percent in FY 2021, accelerated further to 6.1 percent in FY 2022, spurred by these stimulative macroeconomic policies (Figure 2).

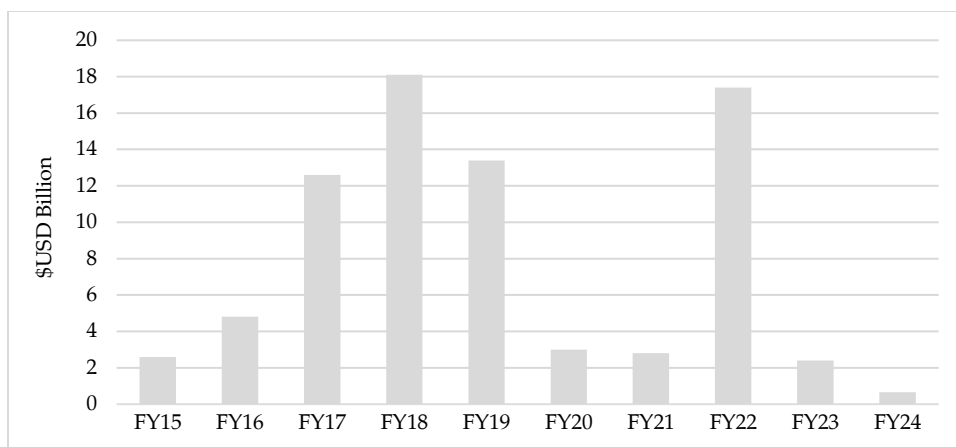
Figure 2: Pakistan's Growth Rates (percentage change in real GDP)



Source: State Bank of Pakistan

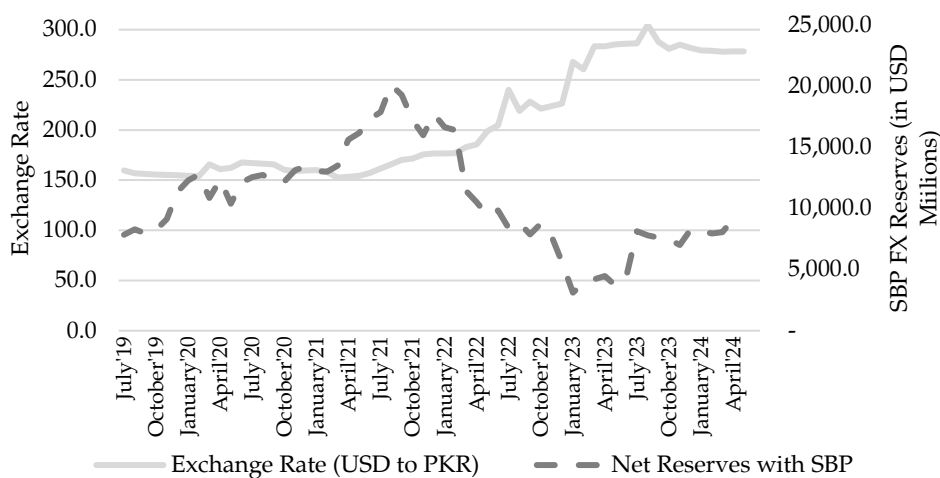
Coupled with the post-COVID recovery in global commodity prices, this overheating in domestic demand precipitated a substantial widening of the current account deficit reaching US\$17.4 billion in FY 2022, a sharp increase from US\$2.8 billion the previous year (see Figure 3). Consequently, SBP foreign exchange (FX) reserves declined from US\$20 billion in August 2021 to \$11.4 billion in March 2022 (see Figure 4). Inflation also increased, rising from 8.4 percent in June 2021 to 12.2 percent in February 2022.

Figure 3: Pakistan's Current Account Deficits



Source: State Bank of Pakistan

Figure 4: Exchange Rate & Foreign Exchange Reserves



Source: State Bank of Pakistan

Following February 2022, the economy encountered a series of significant and unanticipated shocks:

- First, the Russia-Ukraine war in February 2022 precipitated a surge in oil and food prices.
- Second, extreme political uncertainty due to the “No Confidence Motion” in the National Assembly, culminating in a change of government in April 2022, succeeded by dissolution of the provincial governments in Punjab and Khyber Pakhtunkhwa in January 2023.
- Third, acute economic uncertainty stemmed from delays in completing reviews under the IMF Extended Fund Facility (EFF) arrangement, eventually leading to its cancellation and the approval of a new Standby Arrangement in July 2023.

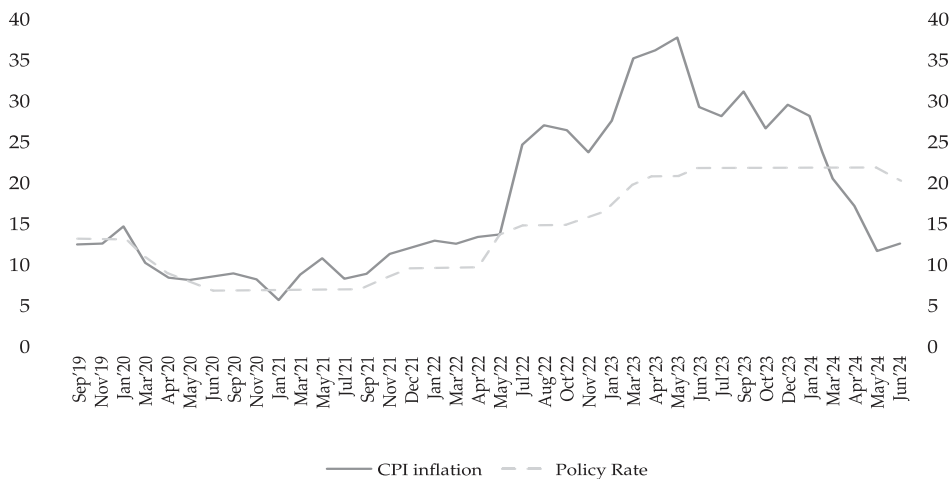
Largely due to acute political and economic uncertainty, as well as a lack of financing for the current account deficit, the Rupee depreciated significantly by, about 40 percent, from Rs180 per US dollar in March 2022 to Rs294 by June 2023 (see appendix Box 1).

Due to the lagged impact of two years of vigorous economic growth, the pass-through of the commodity price shock of February 2022, and the substantial depreciation of the exchange rate, inflation escalated from 12.2 percent in February 2022 to 21.3 percent in June 2022 and 38 percent in May 2023 (see Figure 5). This rise in inflation also led to a de-anchoring of inflation expectations (see appendix Box 2).

In response, the MPC sharply accelerated the monetary tightening cycle initiated in September 2021, raising the policy rate by 675 basis points in FY2022 and an additional 825 basis points in FY 2023. Fiscal discipline also improved markedly, with the primary deficit narrowing from 3.1 percent of GDP in FY 2022 to 0.8 percent of GDP in FY2023.

This coordinated withdrawal of monetary and fiscal stimulus effectively tempered domestic demand. Concurrently, as SBP FX reserves plunged close to a historic low of US\$3.1 billion in January 2023, FX controls were imposed on imports.

Figure 5: Inflation and Policy Rate

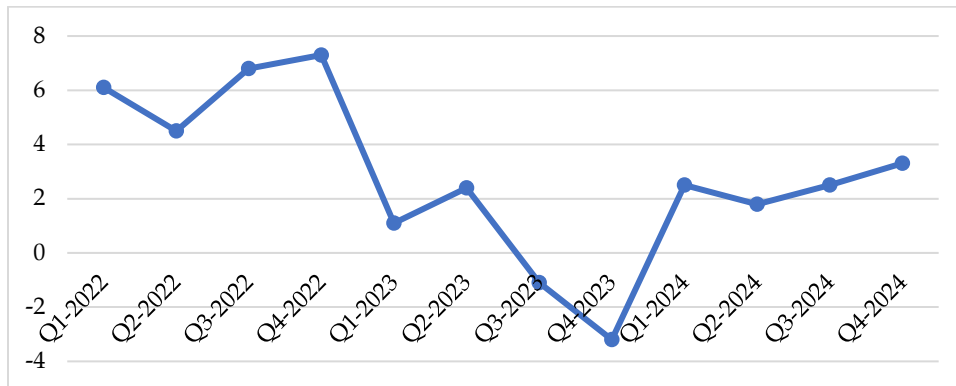


Source: State Bank of Pakistan

To ensure adequate liquidity in the interbank market, SBP increased the average outstanding stock of open market operations (OMOs) by Rs3,328 billion, equivalent to 51 percent of the fiscal deficit in FY 2023. This measure was crucial for maintaining market rates proximate to the policy rate, especially considering the substantial fiscal deficit, limited external inflows for budgetary support, pronounced economic uncertainty and panic surrounding the fate of the IMF program. Nevertheless, by increasing liquidity, these OMOs might have also to some extent inadvertently contributed to the protracted moderation of inflation.

Overall, heightened economic uncertainty, stringent macroeconomic policies and import restrictions precipitated a pronounced deceleration in economic activity, contributing to a reduction in the current account deficit to \$2.4 billion in FY 2023. Specifically, growth declined from 7.3 percent in the fourth quarter of FY 2022 to 1.1 percent in the first quarter of FY 2023 and further contracted to 3.2 percent in the fourth quarter. (See Figure 6)

Figure 6: Quarterly GDP Growth Rates - 2022 to 2024



Source: National Income Accounts, PBS (2024)

Stabilization in 2024

Following a nine-month hiatus, the IMF approved a US\$3 billion nine-month Stand-By-Arrangement for Pakistan on July 12, 2023. General elections, originally scheduled for 2023, transpired on 8 February 2024, subsequently leading to the constitution of new national and provincial governments. Ergo, both economic and political uncertainties have abated from their earlier extreme levels.

On the policy front, the government instituted a prudent fiscal policy, with a primary surplus of 0.9 percent of GDP in FY 2024, contrasting favorably with the primary deficit of 0.5 percent last year. Concurrently, monetary policy maintained an appropriately restrictive posture, with the policy rate unchanged at 22 percent for 12 months, ending in June 2024. This yielded a positive real interest rate prospectively, given projected disinflation. The exchange rate has demonstrated resilience, hovering around Rs280 against the US dollar since October 2024, while SBP FX reserves stabilized at approximately US\$8 billion.

Notwithstanding, inflationary pressures persisted, primarily fueled by substantial upward revisions in administered prices of electricity and gas. During the first 7 months of FY 2024, headline inflation fluctuated between 28 and 30 percent; however, a disinflationary trend has been evident since February 2024, with inflation decelerating to a 30-month low of 12.6 percent by June 2024.

3. Was Monetary Policy Too Tight? Key Myths and Criticisms

Despite the nascent moderation of inflation following two years of elevated price pressures, many contend that the monetary policy response—characterized by an increase in the policy rate from 7 percent at the beginning of FY2022 to 22 percent by end FY2023, and its subsequent maintenance at that level for 12 months—was

unduly aggressive and counter-productive. These reservations typically emanate from three principal lines of reasoning or critiques directed at monetary policy in Pakistan, which we will now address seriatim.

Monetary policy should not be used when inflation is caused by supply-side factors

One argument posits that because monetary policy primarily mitigates inflation by curtailing demand within the economy, it is ineffectual when inflationary pressures stem from supply-side shocks.⁶ This perspective gained prominence among economists during the 1970s when the United States, United Kingdom and other industrialized economies grappled with stagflation precipitated by the OPEC oil price shock. At that time, a prevailing belief held that a reduction in aggregate demand constituted the sole mechanism through which monetary policy could influence inflation.

However, this viewpoint represents an oversimplification, as contemporary understanding acknowledges a more nuanced perspective (see Bander et al. (2023) for a review, and Ocampo and Ojeda-Joya (2023) for emerging market implications). The current mainstream view accords greater importance to inflation expectations. The prevailing consensus suggests that if inflation arises from a supply shock, the central bank may countenance a transient breach of its medium-term inflation target, contingent upon the firm anchoring of long-term inflation expectations, thereby mitigating second-round effects via wage and price adjustments.

Furthermore, the central bank cannot presume the stability of inflation expectations; failure to act decisively against inflation risks can contribute to a de-anchoring of these expectations, as evidenced during the 1970s and early 1980s, potentially necessitating a more abrupt and destabilizing monetary policy tightening subsequently.

Thus, the optimal policy response is contingent upon the prevailing economic situation within a country. Specifically, should the probability of inflation becoming entrenched in expectations be elevated, the central bank needs to act forcefully even if inflation is supply driven. In addition, external supply shocks, exemplified by oil price shocks in Pakistan, often engender exchange rate depreciation, thereby exacerbating inflationary pressures.

Thus, in economies such as Pakistan, characterized by a pronounced exchange rate pass-through and vulnerable inflation expectations, the central bank may need to countenance an aggressive response to meet its inflation targets, even when the

⁶ As discussed in the previous section, the extent to which the recent inflationary episode was purely supply-driven is debatable, particularly given the very high growth rates and large fiscal deficits in the preceding two years.

price shock is supply-side driven. Moreover, in a country like Pakistan confronting low foreign exchange (FX) reserves and a binding balance of payments constraint, central bank inaction in the face of a supply shock could precipitate exchange rate instability, thereby augmenting the risk of high inflation becoming entrenched in expectations.

Monetary policy is ineffective when government borrowing is dominant

In this context, it is essential to examine the role of government borrowing in shaping monetary policy effectiveness. Some argue that when government borrowing constitutes a significant portion of outstanding bank credit and accounts for most of the new credit in a country, monetary policy becomes ineffective. This ineffectiveness arises because government borrowing is largely unresponsive to changes in interest rates, raising critical considerations for policymakers in managing economic stability.

However, the assumption that government expenditure is unaffected by interest rates lacks empirical support. High interest rates have been shown to be effective in exerting pressure on governments to either curtail discretionary spending or increase revenue generation. In any case, this argument is flawed because, even under such conditions, monetary policy retains some effectiveness. As long as some private sector credit exists, monetary policy will dampen aggregate demand. Conversely, an easing of monetary policy will stimulate private sector demand, thereby intensifying inflationary pressures.

Moreover, bank credit is not the only channel through which tighter monetary policy influences demand and inflation expectations. Tighter monetary policy also lowers inflation by supporting the exchange rate, dampening property and asset prices (thereby reducing private demand through wealth effects), and raising interest rates in the informal economy (see Agha et al., 2005; Husain et al., 2022).

High policy rates make inflation worse through their impact on the budget deficit

Another set of critics alleges that higher policy rates increase debt service costs and the fiscal deficit, which in turn boosts demand and adds to inflationary pressures. While there is some validity to this argument, several other factors must be considered to assess the extent of its impact on inflation (see Zoli, 2005):

- First, as stated earlier, a high policy rate should encourage a prudent fiscal agent to cut its borrowing requirements and the fiscal deficit.
- Second, the impact depends on how the higher fiscal deficit is financed. If it is financed through money printing, it is more likely to be inflationary. Conversely, if it leads to the crowding out of private credit, it is less likely to have such an effect.

- Third, as noted above, failure to maintain a high policy rate in the face of high inflation would activate other inflationary channels—such as inflation expectations, increase in asset prices and exchange rate depreciation—which would further contribute to inflationary pressure.

4. Conclusions

Debunking Common Myths and Building Guideposts for Monetary Policy in Pakistan

We end with some conclusions regarding the major criticisms typically leveled at monetary policy in Pakistan, particularly considering the monetary policy response over the last two years, based on our review of the literature and international experience.

These conclusions help to provide guideposts for monetary policy decision-making under various economic circumstances for an economy like Pakistan, which is prone to crises and balance of payments (BOP) constraints:

- First, even when inflation stems from a supply shock, monetary policy plays a crucial role by limiting second-round effects, reducing the risk of entrenched inflation, and preventing inflation expectations from becoming de-anchored. When inflation expectations are unstable, a forceful central bank response is critical.
- Second, in situations where exchange rate pass-through to inflation is high and foreign exchange reserves are low, inaction can lead to exchange rate instability and significantly higher inflationary pressures.
- Third, even when government borrowing dominates, monetary policy remains effective because it imposes a premium on fiscal discipline and controls inflationary pressures through other channels.
- Fourth, the central bank must account for the fiscal authority's current stance; if fiscal policy lacks prudence, monetary policy may need to attempt to offset it. While this is far from ideal and the central bank's capacity to compensate is limited, failing to act could exacerbate both inflationary pressures and external account vulnerabilities.
- Fifth, the central bank should prioritize the “real” interest rate over nominal rates, as nominal rates tell us nothing about the stance of monetary policy. For example, if inflation is accelerating at 30 percent annually, an interest rate of 25 percent imposes minimal burden on borrowers and fails to sufficiently incentivize savers. The objective should be to maintain a positive real interest rate on a forward-looking basis, ideally aligned with historical norms in Pakistan, typically 2 - 3 percent. During episodes of extreme crises or when

foreign exchange reserves are critically low and external balances are fragile, the real interest rate may need to temporarily exceed 2 – 3 percent to stabilize external accounts.

Implications for Future Monetary Policy Settings

Finally, we use these guideposts to speculate on the future trajectory of monetary policy as the economy stabilizes and inflation further subsides. Given that the poor are disproportionately affected by rising prices, controlling inflation must be a paramount major national priority. Simultaneously, an acceleration in the economic growth rate is also urgently required.

For the central bank, achieving a reduction in inflation to the medium-term target of 5-7 percent over the next 18 to 24 months should take precedence, as this aligns with its primary objective according to the SBP Act. Once the economy is firmly on a path toward this goal, the MPC can shift its focus to promoting economic activity, considering balance of payments constraints as indicated by the position of foreign exchange reserves. However, it is important to note that a sustainable increase in the growth rate cannot be accomplished solely through loose fiscal and monetary policies; it necessitates structural reforms.

As Pakistan's economy stabilizes, negotiations with the IMF for another Extended Fund Facility (EFF) program advance, and real interest rates become increasingly positive as inflation declines, there should be scope for a reduction in policy rates over time, provided other conditions remain stable.

However, caution is warranted, particularly since inflation expectations have yet to stabilize around the 5-7 percent medium-term target. The experiences of 2022-2023 serve as a reminder against prematurely declaring success in fiscal discipline and external support. At this juncture, alongside inflation, the sustainability of the current account and exchange rate stability must be pivotal factors in determining the monetary policy stance.

The potential for rate cuts hinges on maintaining prudent fiscal policy, the pass-through effects of tax increases and administered price adjustments in the budget that will influence inflation trajectories, and ensuring that the external situation remains manageable under the auspices of an IMF program with adequate external financing. Additionally, global commodity prices must be continuously monitored, given ongoing developments in the Middle East.

Furthermore, the impact of the growth on imports must be carefully monitored, since rapid expansion under the existing economic paradigm can precipitate balance of payments pressures in the form of an escalating current account deficit and dwindling FX reserves (see Rosbach and Aleksanyan, 2019). Therefore, until

structural reforms raise Pakistan's BOP-constrained growth limit, the central bank must exercise heightened caution once the growth rate rises above a certain prudent range.

Finally, regarding OMOs, while increasing outstanding OMOs may have been unavoidable over the last 18 months, the scale and tenor of the OMOs should be meticulously calibrated. Large scale, long tenor, one-sided liquidity injections should not become routine, as they can spur unwarranted increases in the money supply and add to inflationary pressures, particularly as the economy rebounds.

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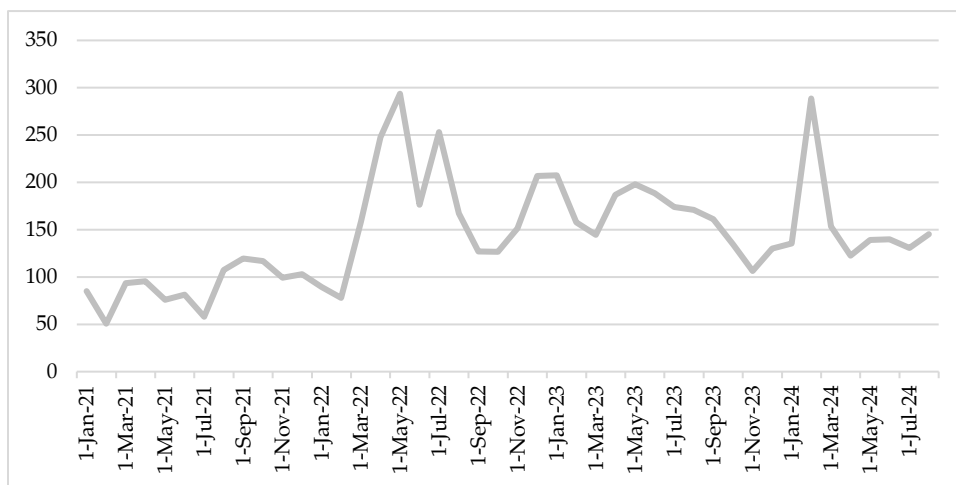
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Appendix

Appendix A: Impact of Economic Uncertainty on Inflation in an Economy with Inadequate Foreign Exchange Reserves

Due to numerous economic and political shocks starting in February 2022, the Pakistan economy has faced a high degree of uncertainty in the last three years. A leading proxy measure of uncertainty is based on the frequency of references to policy-related uncertainty in the newspapers (see Ozturk and Xuguang (2017)). Fortunately, SBP has developed such a measure and regularly publishes an index of Economic Policy Uncertainty in Pakistan. This index shows an explosive increase in uncertainty in March 2022 and, while this episode of uncertainty peaked in May, it has remained elevated since then with another peak coinciding with the national elections in February 2024 (see Figure 1).

Figure 1: SBP Economic Policy Uncertainty Index (4 newspapers)



Source: State Bank of Pakistan

It is well-known that economic and political uncertainty affects investment, consumption and production decisions and thus indirectly inflation. A few studies that have looked at its impact on price dynamics show that higher uncertainty is associated with higher inflation (Aisen and Veiga (2006), Khan and Saqib (2009)) and according to a recent SBP (2024) study “uncertainty was the second largest contributor during the current inflationary episode”. Moreover, in the case of an economy with inadequate foreign exchange reserves like Pakistan, there are other channels that can greatly enhance the impact of uncertainty on inflation when the external situation deteriorates significantly and risk perceptions spike. According to Pirzada (2024), “the increase in current and expected risk premium was the key

driving factor leading to the surge [in inflation] during the period under consideration [May 2022 to May 2023]". As a proxy for the risk premium, he uses the premium on one-year credit default swaps (CDS) for Pakistan which increased from around 5 percentage points before the crisis to an average of 40 percentage points during the second half of 2022.

That a change in Pakistan's country risk premium could have such a large and immediate impact on the domestic economy may seem surprising given that Pakistan does not have *de jure* capital account convertibility, although it has had *de facto* capital account convertibility since the early 1990s (Haque, 2011). The sharp increase in the risk premium is likely to have prompted households and businesses to adjust their portfolios by increasing their foreign currency holdings vis-a-vis rupee holdings, compounding the pressure on the exchange rate from the burgeoning current account deficit. There were two episodes of depreciation of the Rupee, the first was between March and July 2022 because of the political instability caused by the vote of no confidence and change of government in March-April 2022, and the second was in the first half of 2023 because of the economic uncertainty resulting from the delay and failure of negotiations with the IMF team for the ninth review under the Extended Fund Facility (EFF) programme in November 2022-February 2023. During the first episode the rupee depreciated by about 18% against the dollar and in the second episode it depreciated by 21%. An important indicator of the capital flight, as a result of the currency portfolio adjustment, is that during this period there was a decline in workers remittances of almost \$4 billion, or over 1% of the GDP in FY2023 compared to FY2022.

In developing countries, the exchange rate pass-through to inflation has tended to be significant and generally large, particularly in high inflation regimes (Edwards, S. (2007), Ndou and Gumata (2017), Musa, N. (2021), Hanif et al. (2022)). Therefore, it is plausible that the decline in the exchange rate from Rs180/\$ in March 2022 to Rs294/\$ in June 2023, which was largely because of the economic and political uncertainty in addition to lack of financing for the current account deficit, was primarily responsible for the surge in inflation in this period.

Appendix B: Inflation Expectations Anchor Adrift?

Inflation expectations are the rate at which people expect prices to rise in the future. It has been shown that households' inflation expectations affect decisions regarding consumption and savings, while firms' inflation expectations are relevant for price-setting, investment and hiring decisions (Andrade, P., et al. (2023), Coibion, O., et al. (2018)). Inflation expectations of households and businesses in one period strongly influence inflation in the next period.

Inflation expectations are important for monetary policy because as long as they remain anchored (i.e. households and businesses expect that the impact of any supply shock on prices will be temporary, and inflation will return to its previous level) monetary policy is effective in controlling inflation. However, if inflation expectations become unanchored, then it requires more aggressive actions on part of the central bank, and takes much longer, to bring inflation back to the target level.

Surveys of households and business expectations, along with long-term interest rates, are used by central banks to monitor inflation expectations. The State Bank of Pakistan (SBP) conducts consumer and business confidence surveys, which include questions on inflation expectations, to inform its monetary policy decision making. The diffusion index is the most used measure to summarize the information from inflation expectations surveys⁷. The diffusion index for the period January 2021 to September 2024 have been plotted in Figure 1. It shows that initially there was some up-and down movement in the index but it remained in a relatively narrow band until May 2022, indicating that inflation expectations were well anchored. However, the diffusion index being consistently above 70 in this period indicates that the anchor was possibly somewhat higher than the SBP's target inflation range of 5 to 7 percent. This is not surprising, as recent research "suggests that (personal) experiences matter a lot for how people form inflation expectations" (Adrian, T. (2023) and inflation in Pakistan has been higher than 7 percent during two-thirds of the period from 1970 to 2023, with the most recent episode of above 7 percent inflation, prior to the current one, in 2005-2015 (SBP 2024). After May 2022, the diffusion index is quite volatile and increases rapidly until March 2023, which suggests that at this point inflation expectations may have become unanchored.

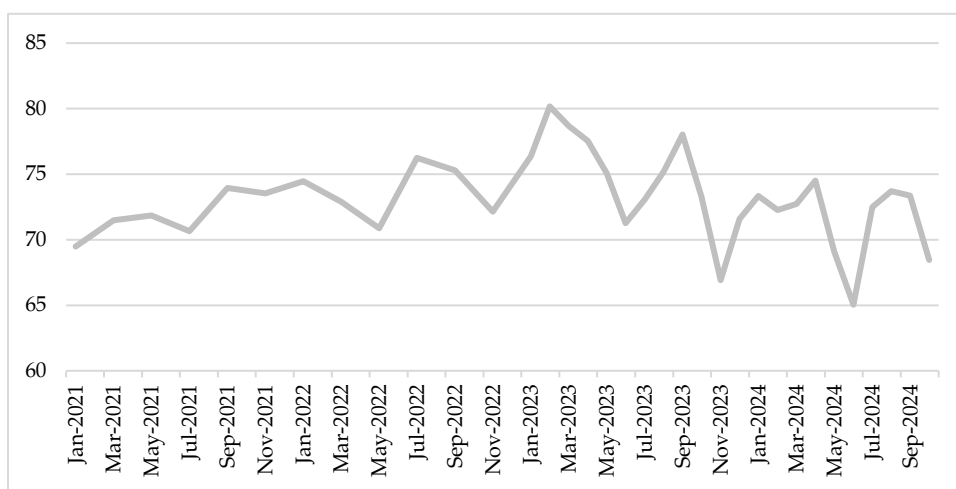
Since March 2023, the diffusion index has declined and in recent months it was in the range seen in the pre-May 2022 period. However, it remained highly volatile suggesting that inflation expectations are not yet completely anchored.

To better predict when inflations expectations are anchored a deeper analysis of the inflation survey data is required than what is contained in the published information on the diffusion index. According to a recent IMF study, it is the shape of the distribution of household expectations that helps predict future inflation and "variance and skewness of household expectations' distributions add predictive power beyond and above the median, especially in periods of high inflation CPI inflation" (Marques et al. (2023)). It is hoped that SBP will also start publishing, along with the diffusion index, information on variance and skewness of the distribution seen in the monthly inflation expectations survey.

⁷ The Diffusion Index is a weighted average of the responses to the question in the survey on the expected increase in prices over the next six months, with the respondents having to choose from the following five options: increase significantly, increase, unchanged, decline, and decline significantly. The diffusion Index ranges from 0 to 100 and a value greater than 50 indicates that positive views are more than negative views and an increase in the index implies an increase in inflation expectations.

Another measure of inflation expectations published by SBP is information based on the quantitative question “expected price of an item in six months that costs Rs100 today”. This information is plotted in Figure 2 for the period January 2021 to September 2024. It confirms the conclusions of our analysis based on the diffusion index, except that it indicates a creeping up of inflation expectations starting in July 2021, well before the likely de-anchoring of inflations happened in May 2022. Possibly, as argued in Syed and Hamid (2024), if the SBP had been also looking at the shape of the distribution of household expectations it would have had an early warning of the possibility of inflation expectations becoming unanchored.

Figure 2: Inflation Expectations I – Diffusion Index



3

Understanding the Nature of Pakistan's trade policies and testing their impact on Pakistan's trade performance

Azam Chaudhry¹, Gul Andaman² and Aymen Junaid³

Abstract

In recent years, the debate surrounding free trade versus protectionism has intensified, particularly as industrialized countries face increasing competition from emerging economies. This argument is of particular importance to Pakistan which faces sluggish exports growth alongside a high level of imports, resulting in multiple balance of payments crises. This study quantifies the types of trade-restricting and trade-promoting policies while assessing the depth of these policies. Both the methodology and the results will be shared with policymakers and other stakeholders to contribute to the ongoing discourse regarding the effectiveness of policies aimed at improving Pakistan's trade performance.

This study analyzed Pakistan's trade policies from 2008 to 2022 using the Global Trade Alert (GTA) database, recognized for its comprehensive coverage of crisis-era trade policies. The research evaluated the nature and extent of trade-promoting and trade-restricting policies in Pakistan and empirically tested their impact on the country's export and import performance. The findings reveal that Pakistan employs a diverse range of trade-related industrial policies. For exports, the focus is on tax incentives and tariff reductions, while import policies focus on tariffs and internal taxation. However, the study found that only certain policies significantly affect trade volumes. Import tariffs, for instance, have a notable impact on export growth while internal taxation influences import growth. Interestingly, traditional export financing mechanisms remain largely unchanged over the study period. To improve policy effectiveness, Pakistan should prioritize less administrative measures such as tariff reductions which have shown positive results.

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Additionally, the country should explore new sectors for trade financing to diversify its export base and reduce reliance on traditional industries.

To bolster exports, Pakistan should prioritize effective policies over traditional strategies. The focus should be on subsidizing credit for exporters, expanding successful programs like the State Bank of Pakistan's Temporary Economic Refinance Facility (TERF) scheme, and reducing tariffs on imported inputs. Additionally, the government should direct spending toward export-focused training and infrastructure development. Transition to cleaner energy sources is essential to align with global market demands. Moreover, enhancing demand-side measures by providing trade officers with data-driven export targets, prioritizing high-value export goods in trade agreements, and supporting firms with proven export potential will be crucial. This shift in approach can drive sustainable export growth beyond reliance on currency depreciation.

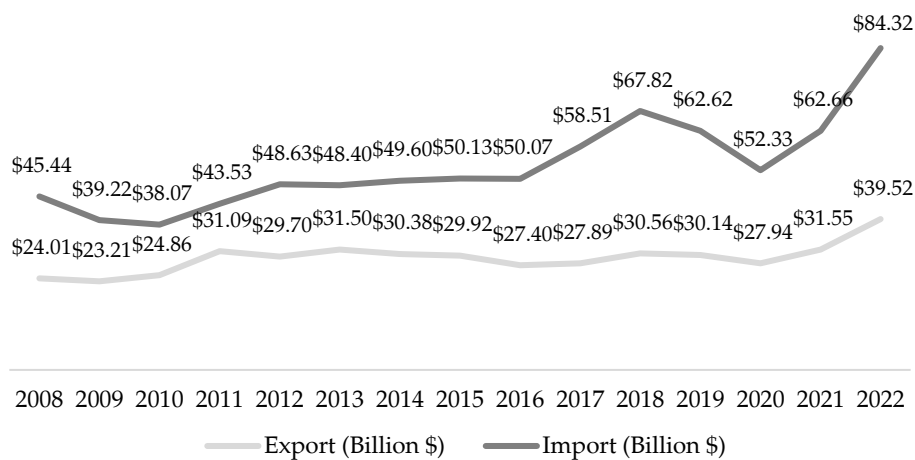
Introduction

International trade theories have evolved significantly over time, each contributing to our understanding of cross-border trade dynamics. Mercantilism, predating Adam Smith, emphasized the necessity of favorable trade balances, by exporting more and importing less. Smith's Absolute Advantage theory (1776), denotes the ability to produce goods or services more efficiently than others. Ricardo's Comparative Advantage theory (1817) refined this concept, arguing that countries have a comparative advantage in producing a good if it can do so at a lower opportunity cost than another country. The Factor Proportion theory, proposed by Ohlin in 1935, posits that a country has a comparative advantage in goods using its abundant factors of production and a disadvantage in goods using scarce factors. Lastly, Product Lifecycle theory by Vernon (1966) suggests that products start in technologically advanced countries but eventually shift production to developing countries due to lower labor costs.

International trade plays a crucial role in improving living standards across nations by facilitating access to essential resources. However, various barriers such as high shipping costs and taxes can impede trade flows. Technological advancements, particularly in information sharing, have significantly eased international trade processes. The benefits of global trade are unevenly distributed. While developed countries reap the biggest share, developing countries account for approximately 41% of trade. In contrast, less developed countries only make up less than 1% of global trade (WTO, 2017, p.5). Trade balance is a critical consideration in international commerce. When a country's imports exceeds its exports, it creates a trade deficit. This imbalance often necessitates borrowing from other nations, potentially compromising the debtor country's autonomy in decision-making.

Pakistan's strategic importance in South Asia is underscored by its significant population, nuclear capabilities, and economic standing. As the world's 25th largest economy, the 70th largest exporting nation, and the 50th largest importer, and the 5th most populous country, Pakistan plays a crucial role in regional and global affairs (CIA World Factbook-2023). However, the nation faces persistent economic challenges, particularly in its international trade balance. In the fiscal year 2022-23, Pakistan's international trade volume reached US\$ 80 billion, with exports at US\$ 30 billion and imports at US\$ 50 billion (SBP-2023). This imbalance has resulted in a substantial trade deficit over the past decade, necessitating urgent attention from economic policymakers. This ongoing deficit has increased Pakistan's reliance on foreign debt, potentially compromising its policy autonomy. Efforts to mitigate such influences are crucial for safeguarding Pakistan's independence and autonomy.

Figure 1: Pakistan's Export and Import



Source: World Bank

Literature Review:

Trade policies play a pivotal role in shaping a country's economic landscape with recent research highlighting the significance of non-tariff measures (NTMs) alongside traditional tariffs. NTMs encompass regulations including quotas, licensing requirements, technical standards, and sanitary and phytosanitary measures. The theoretical framework for industrial policies spans several decades, with contributions from authors like Hirschman (1958), Krugman (1991), Harrison and Rodriguez-Clare (2010), Stiglitz et al. (2013), Liu (2018), and Moll (2019). Earlier empirical studies on industrial policy primarily focused on documenting the effects on industries or countries in terms of output, revenue, and growth rates (Baldwin and Krugman, 1988; Hansen et al., 2003; Head, 1994; Luzio

and Greenstein, 1995; Irwin, 2000). However, more recent research has recognized the importance of assessing impacts on productivity and cross-sector spillovers (Aghion et al., 2015; Lane, 2017).

The literature on trade policies encompasses a wide range of interventions, including export subsidies (Das et al., 2007), R&D subsidies (Hall and Van Reenen, 2000; Bloom et al., 2002; Wilson, 2009), place-based policies targeting disadvantaged geographical areas (Neumark and Simpson, 2015; Criscuolo et al., 2019), and environmental subsidies such as renewable energy subsidies (Yi et al., 2015; Aldy et al., 2018). These studies aim to understand the impacts of different policy interventions on economic outcomes and industrial development. In a study by Hoekman & Nicita (2008), the authors explore indices of trade restrictiveness and facilitation developed at the World Bank. Their analysis reveals that, despite preferential access programs, tariffs and NTMs remain significant sources of trade restrictiveness for low-income countries. Surprisingly, the value of trade preferences is often limited, as many country-pairs share similar degrees of access. Consequently, improving logistics performance and facilitating trade could substantially expand developing country trade, potentially doubling the impact of reducing remaining border barriers. Khandelwal and Atkin (2022) analyze empirical evidence regarding the impact of international trade in developing countries. They explore how trade policies interact with weak institutions, market failures, and firm distortions. This study sheds light on the challenges faced by developing nations and provides insights into potential policy responses to enhance trade effectiveness.

Easson (2001) highlights the value of tax incentives in attracting foreign direct investment (FDI). While developed countries utilize tax incentives to promote exports and research, developing nations employ them primarily to attract FDI and enhance specific sectors or regions. Moreover, Choi et al. (2021) analyze a dynamic growth model to quantify how international trade impacts the long-term growth of emerging economies, emphasizing trade policies. Their model suggests that openness to trade and eliminating trade barriers could boost annual real GDP growth by up to three percentage points over decades. Recognizing the positive relationship between international trade and economic growth is crucial. Newly industrialized economies like Korea, Singapore, China, and Thailand have witnessed rapid growth due to their engagement in global trade. This highlights the importance of effective trade policies and incentives in fostering economic development and attracting investment.

Meltiz (2004) examines the dynamics of infant industries, which operate in a competitive environment and benefit from external dynamic learning effects. In contrast, the foreign industry is mature and produces goods that are imperfect substitutes for domestic products. A government planner can protect the infant industry through domestic production subsidies, tariffs, or quotas to enhance long-term domestic welfare. The study finds that quotas often lead to higher welfare

levels than tariffs. In certain cases, the advantages of quotas can compensate for any government revenue loss associated with quota administration, including scenarios like voluntary export restraints where no revenue is collected. Additionally, quotas may even be preferred over domestic production subsidies in specific situations.

Trade policy continues to play a significant role, particularly when it intersects with other factors like technological advancements. Across various countries, there exists varying degrees of favoritism towards manufacturing industries, often at the expense of primary sectors. Notably, Argentina, Brazil, Chile, Pakistan, and the Philippines offer substantial incentives to manufacturing sectors. However, the extent of such protection varies, with Mexico, Korea, and Taiwan exhibiting relatively less bias. Such policies aim to enhance competitiveness and foster technological progress in manufacturing. However, informed economic decisions necessitate a thorough understanding of trade policy's multifaceted effects considering both short-term protection and long-term industrial development goals (Balassa, 1971).

In their influential paper, "The Effects of Trade Policy," Pinelopi K. Goldberg and Nina Pavcnik (2016) investigate the complex impacts of trade policies on economies, particularly in developing countries. Their analysis reveals that trade liberalization measures, such as tariff reductions and trade agreements, can foster economic growth by enhancing productivity and promoting efficiency gains. However, they also find that these policies may exacerbate income inequality in the short term, particularly affecting low-skilled workers and industries facing import competition. Despite potential distributional challenges, trade liberalization generally benefits consumers through lower prices and increased product variety. Goldberg and Pavcnik stress the importance of implementing complementary policies, such as investments in education and training, to mitigate the adverse effects on vulnerable workers and industries. Their research underscores the nuanced nature of trade policy effects, emphasizing the need for careful consideration of distributional consequences to maximize the benefits of globalization while minimizing its social costs. Overall, their findings indicate that while trade liberalization can drive growth, targeted support is essential for those adversely affected to ensure equitable outcomes.

Studies like Baldwin (2016) and Schiff and Winters (2003) underscore the potential of export subsidies and tax incentives to stimulate export growth, especially in developing countries with limited market access. Conversely, Feenstra (2004) and Knetter (1989) reveal the adverse effects of export restrictions, such as tariffs and quotas, which can distort markets and hinder economic efficiency. These findings emphasize the nuanced effects of policy interventions and stress the importance of strategic policy design to maximize economic benefits while mitigating potential drawbacks. Research by Rodriguez and Rodrik (2001) and Dixit and Stiglitz (1977) emphasize the potential benefits of import substitution policies in

fostering domestic industrial development and reducing reliance on foreign goods. However, studies by Bown (2011) and Broda and Weinstein (2006) highlight the detrimental effects of import restrictions, such as tariffs and quotas, which can raise consumer prices, limit product variety, and hinder economic efficiency. Together, these findings underscore the need to consider the nuanced implications of import policies for overall economic welfare and industrial competitiveness.

Data:

To create indicators for industrial policy practices, we rely on detailed textual information describing economic policies. Our approach involves utilizing the Global Trade Alert (GTA) database, which offers comprehensive data on commercial policies dating back to 2008 and continuing to the present.

The GTA initiative is ambitious in its scope, drawing on an international network of policy experts to identify government policies and credible announcements that prioritize domestic interests over foreign commercial interests (Evenett and Fritz, 2020a). Since its establishment in 2008, the GTA project has aimed to capture a wide range of measures, including detailed textual descriptions of these policies.

The GTA database, is arguably the most comprehensive collection of non-tariff measures available (Evenett, 2019) offering extensive coverage comparable to established projects from multilateral institutions such as the United Nations Conference on Trade and Development (UNCTAD) and the World Trade Organization's (WTO). Its independence from country reporting compliance is a significant advantage.

The GTA database categorizes interventions into various types, including import tariffs and antidumping policies. Each country implements different state acts within these intervention types. In our analysis, we will focus on these intervention types and state acts, dividing them based on export or import policies. We will analyze data from 2008 to 2023, which consists of 8,414 observations for Pakistan, further divided between export and import policies. This extensive dataset allows for a detailed examination of Pakistan's trade policy interventions over time.

Figures 2.1 and 2.2 show the cumulative intervention types in descending order for the top 10 intervention types, based on number of state acts in each intervention type and recorded instances. Based on the dataset, import tariff emerges as the major industrial policy used by Pakistan, consisting of 216 state acts implemented 2,904 times. This finding is consistent with existing literature. Based on the number of state acts, anti-dumping policy ranks second, with 184 implementations. However, when examining recorded instances, tax-based export incentives emerge as the second most common policy, implemented 1,979 times. For this reason, our analysis

will focus on the recorded instances which provides more accurate representation of policy implementation. Figure 1.1 to 1.16 and 2.1 to 2.16 in appendix A illustrate the yearly state acts and recorded instances for each intervention type. We can observe from the yearly data that the types of industrial policies being used by Pakistan has increased over the years, so has the recorded instances for these policies. Since 2017, import tariff and tax-based export incentives have been the top two policies implemented.

The National Tariff Policy (NTP) in Pakistan recognizes the importance of imposing import tariffs to foster industrial development, enhance export growth, and improve competitiveness. Historically, tariff liberalization led to significant export expansion, with applied weighted mean tariffs decreasing from 23.1% to 8.9% between FY2000 and FY2014. However, recent trends indicate a reversal of tariff liberalization, resulting in reduced exports. While import tariffs serve resource allocation and revenue purposes, excessive tariffs can hinder industry competitiveness and create an anti-export bias.

Figure 2.1: Intervention type by number of state act (2008 to 2023)

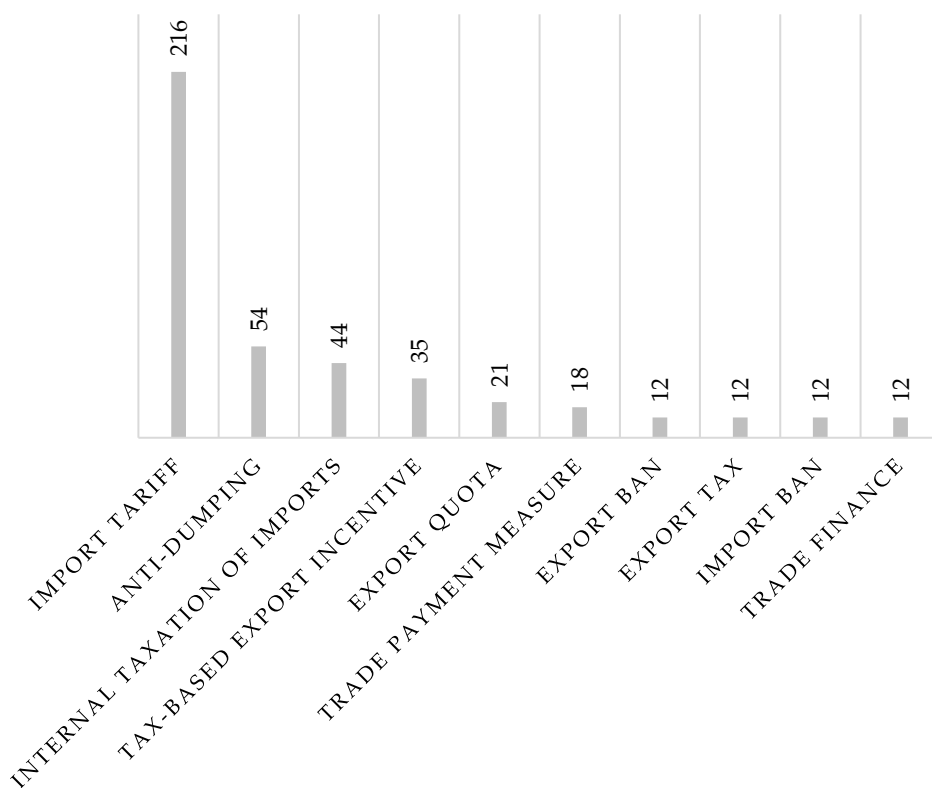
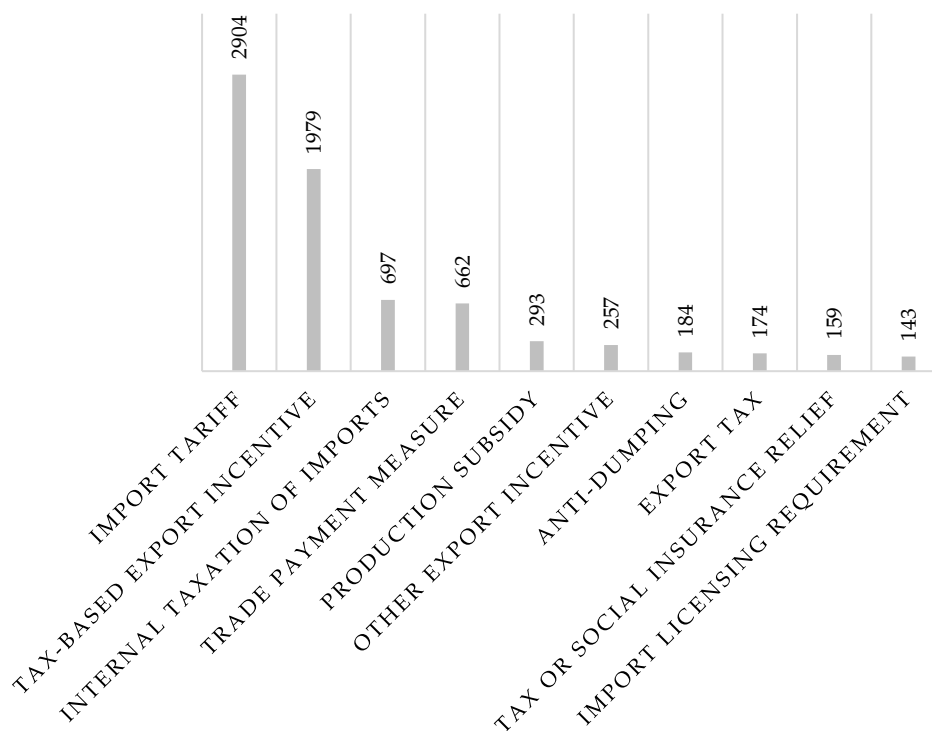


Figure 2.2: Intervention type by recorded instances (2008 to 2023)



Categorization of data

Our data analysis comprises a two-stage categorization process to examine Pakistan's trade policies. The first stage differentiates interventions into export or import policies, allowing us to quantify their implementation over time. The second stage involves a more detailed classification, assessing whether these policies promote or restrict trade. This approach involves carefully evaluating each state act to determine its impact on trade dynamics. By doing so, we gain valuable insights into how implemented policies affect our overall trade performance. Table 1 shows some examples of export/import promoting or restricting policies.

Table 1: Categorization of data

Intervention Type	State Act	Export/Import	Promoting/Restricting
Tax-based export incentive	Pakistan: Duty drawback rates increased for certain textile products	Export	Export Promoting
Other export incentive	Pakistan: Incentive on machinery purchase for SMEs and export sectors	Export	Export Promoting
Export quota	Pakistan: Export ban on sugar replaced with quota	Export	Export Restricting
Export tax	Pakistan: Regulatory duty imposed on exports of molasses	Export	Export Restricting
Import tariff	Pakistan: Increased depreciation allowance on customs duty when importing used cars	Import	Import Promoting
Import quota	Pakistan: Temporary sugar import quota announced with a reduction of internal taxes	Import	Import Promoting
Import ban	Pakistan: Import ban on CNG cylinders and conversion kits	Import	Import Restricting
Import tariff	Pakistan: Regulatory duty increased on several products (October 2017)	Import	Import Restricting

Figure 3.1 shows the recorded instances of the export policies being implemented by Pakistan, with tax-based export incentives as the major policy, followed by other export incentives. A tax-based export incentive refers to government programs designed to encourage businesses to engage in exporting certain types of goods or services. These incentives typically involve tax benefits aimed at reducing the cost of exporting, making products more competitive in international markets. As for import policies, Figure 3.2 indicates that the major policy is import tariffs, followed by internal taxation of imports.

Figure 3.1 Export Policies (Recorded Instances) (2008 to 2023)

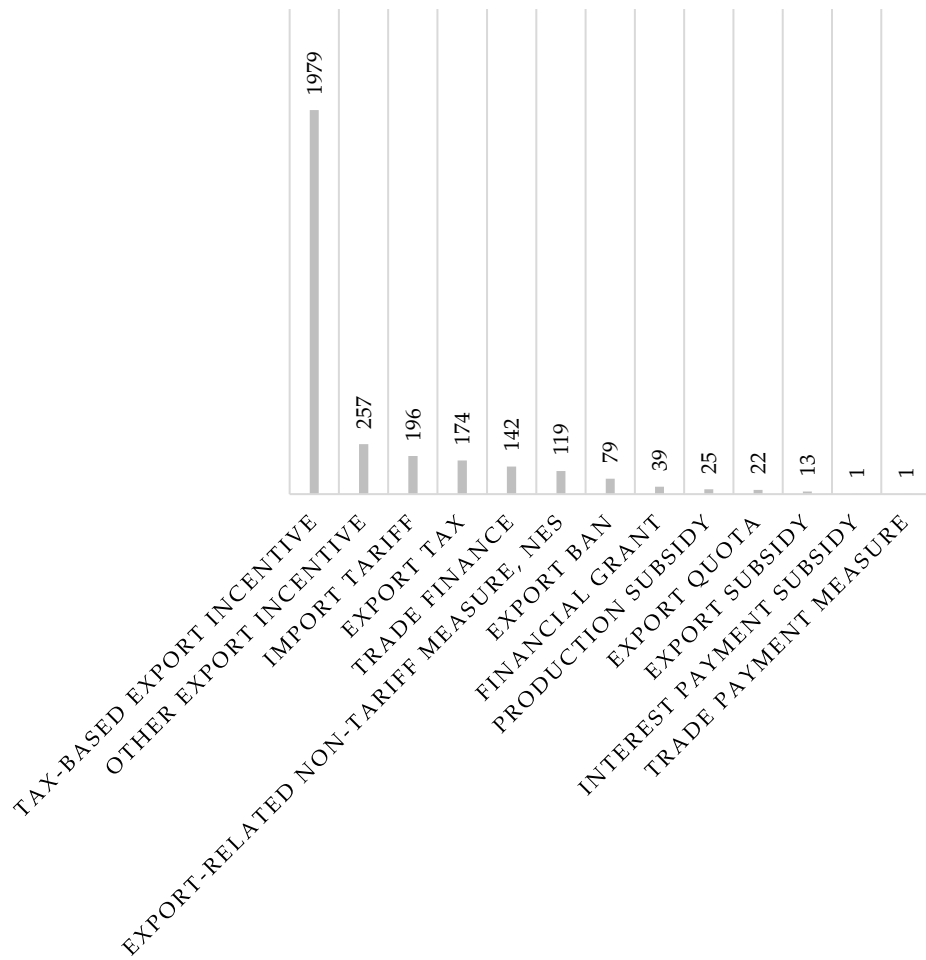
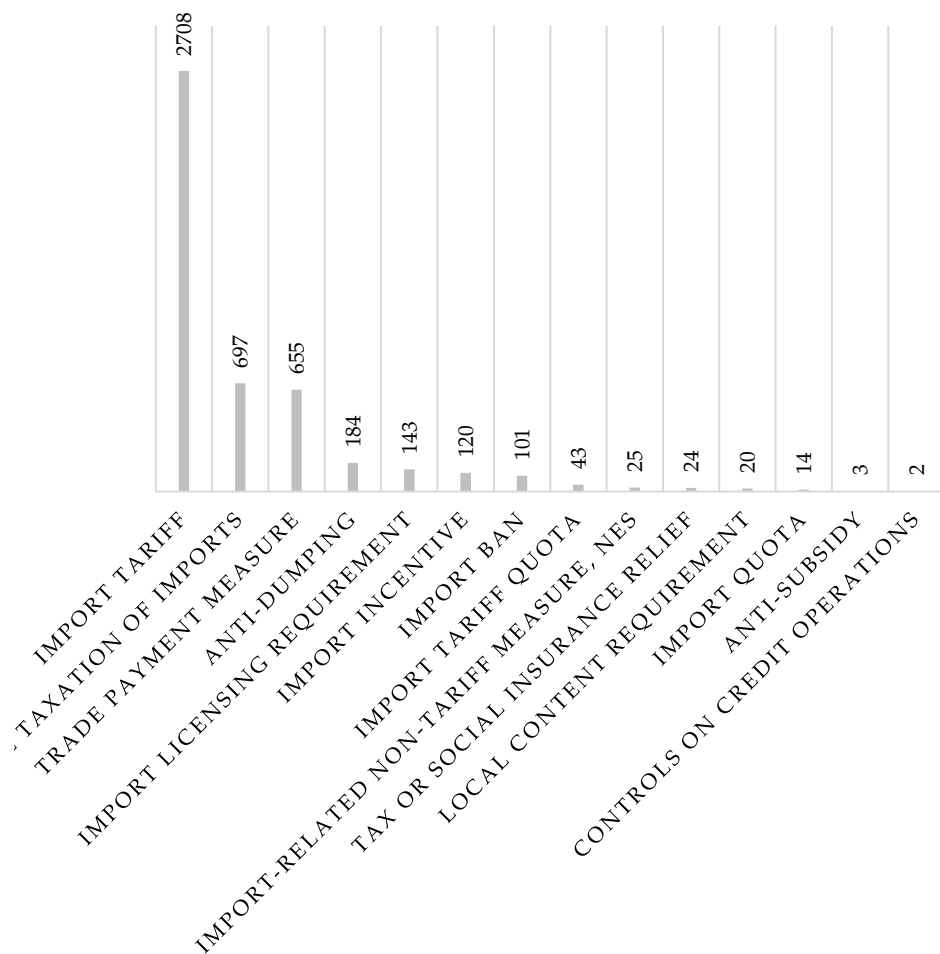


Figure 3.2 Import Policies (Recorded Instances) (2008 to 2023)



Data Descriptives:

The table consists of number of state acts implemented by intervention type for export/import promoting and restricting policies. For import tariffs, there are 187 state acts in total. Among these, 96 are categorized as import promoting policies, while 83 are categorized as import restricting policies.

Table 2: Intervention Type by Policy

	Intervention Type (Recorded Instances in brackets)	Number of State Acts Implemented	EP	ER	IP	IR
1	Anti-dumping (184)	54	0	0	15	39
2	Anti-subsidy (3)	2	0	0	1	1
3	Controls on credit operations (2)	2	0	0	2	0
4	Export ban (77)	11	2	9	0	0
5	Export quota (21)	21	16	5	0	0
6	Export subsidy (13)	8	4	4	0	0
7	Export tax (136)	11	3	8	0	0
8	Export-related non-tariff measure, nes (119)	6	3	3	0	0
9	Financial grant (39)	1	1	0	0	0
10	Import ban (99)	11	0	0	0	11
11	Import incentive (34)	1	0	0	1	0
12	Import licensing requirement (143)	5	0	0	5	0
13	Import quota (14)	7	0	0	7	0
14	Import tariff (2398)	187	9	0	96	83
15	Import-related non- tariff measure, nes (24)	7	0	0	5	2
16	Interest payment subsidy (1)	1	1	0	0	0
17	Internal taxation of imports (559)	35	0	0	23	12
18	Local content requirement (20)	1	0	0	1	0
19	Other export incentive (257)	8	8	0	0	0
20	Production subsidy (25)	1	0	1	0	0
21	Tax or social insurance relief (24)	1	0	0	1	0
22	Tax-based export incentive (1979)	35	30	5	0	0
23	Trade finance (142)	12	12	0	0	0
24	Trade payment measure (656)	17	1	0	9	7

The following table shows the specificity of state acts implemented under various policy types. Sector specific, SME or state controlled. For import tariffs, 14 state acts are sector-specific, while 16 all under all of the mentioned policy types. Notably, the majority of the state acts are not specifically targeted at firms, locations, or sectors.

Table 3:

State Acts that are: (Recorded Instances in Brackets)							
Intervention Type		ALL	Firm Specific	Location Specific	Sector Specific	SMEs	State Controlled
1	Anti-dumping	1 (1)	1	0	0	0	0
2	Anti-subsidy	0	0	0	0	0	0
3	Controls on credit operations	1 (1)	1	0	0	0	0
4	Export ban	0	0	0	0	0	0
5	Export quota	1 (1)	1	0	0	0	0
6	Export subsidy	0	0	0	0	0	0
7	Export tax	0	0	0	0	0	0
8	Export-related non- tariff measure, nes	0	0	0	0	0	0
9	Financial grant	0	0	0	0	0	0
10	Import ban	0	0	0	0	0	0
11	Import incentive	0	0	0	0	0	0
12	Import licensing requirement	0	0	0	0	0	0
13	Import quota	1 (1)	1	0	0	0	0
14	Import tariff	16 (270)	1 (9)	1 (9)	14 (252)	0	0
15	Import-related non- tariff measure, nes	0	0	0	0	0	1
16	Interest payment subsidy	0	0	0	0	0	0
17	Internal taxation of imports	3 (70)	2 (67)	0	1 (3)	0	0
18	Local content requirement	0	0	0	0	0	0
19	Other export incentive	1 (1)	1	0	0	0	0
20	Production subsidy	0	0	0	0	0	0
21	Tax or social insurance relief	0	0	0	0	0	0
22	Tax-based export incentive	0	0	0	0	0	0
23	Trade finance	0	0	0	0	0	0
24	Trade payment measure	1 (40)	0	0	1 (40)	0	0

Export Policies

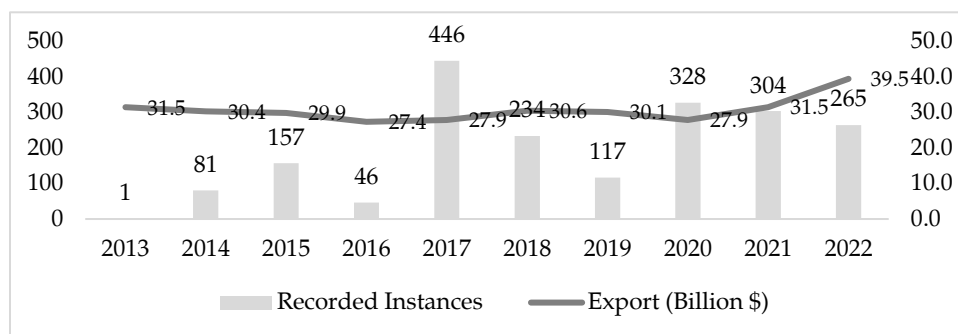
By analyzing the top five policies separately along with the Pakistan's exports, we do see some impact on exports for certain policies. Figures 4.1 to 4.5 show the data for these policies.

Tax-Based Export Incentive

The graph illustrates the trend of Tax-Based Export Incentives from 2013 to 2021. It showcases the relationship between recorded instances of these incentives and the total export value (in billions) over the specified years. By analyzing this data, we

gain insights into the effectiveness of tax incentives in promoting exports and their impact on overall trade performance. We can also observe that tax-based export incentives were used as an industrial policy after 2013.

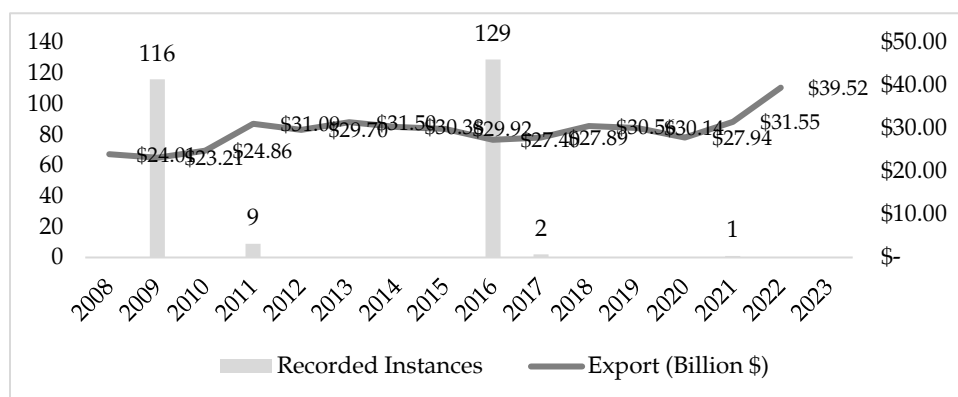
Figure 4.1 Tax – Based Export Incentive



Other Export Incentives

The upward trend reveals a positive correlation between recorded instances of export incentives and export values. As the number of export incentives increases, there is a corresponding rise in export values, highlighting the effectiveness of these policies. These incentives, including tax breaks, duty exemptions, export credit subsidies, and export processing zones, play a crucial role in supporting economic growth, maintaining competitiveness, and stimulating overall development.

Figure 4.2 Other Export Incentive

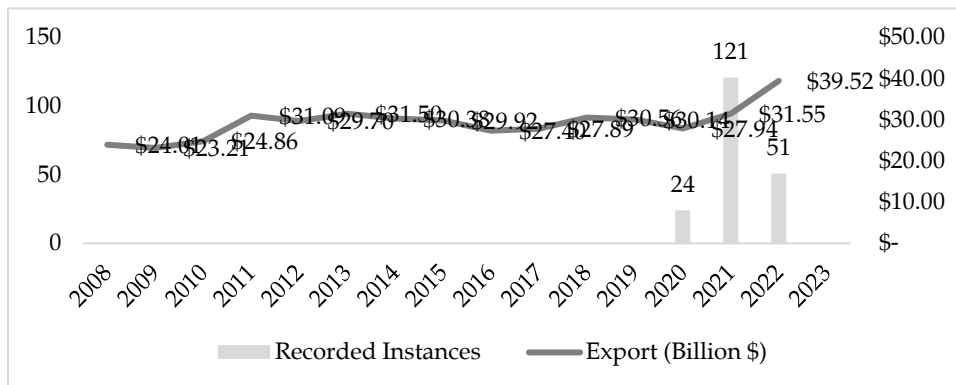


Import Tariff for exports.

This visual representation highlights the positive correlation between increased import tariffs and rising export values, emphasizing the impact of tariffs on exports.

An example of a state act for this policy is Pakistan's duty drawback amended on the exports of pharmaceutical products which was implemented to support the export sector by reimbursing customs duties on exported goods, thereby enhancing competitiveness in international markets.

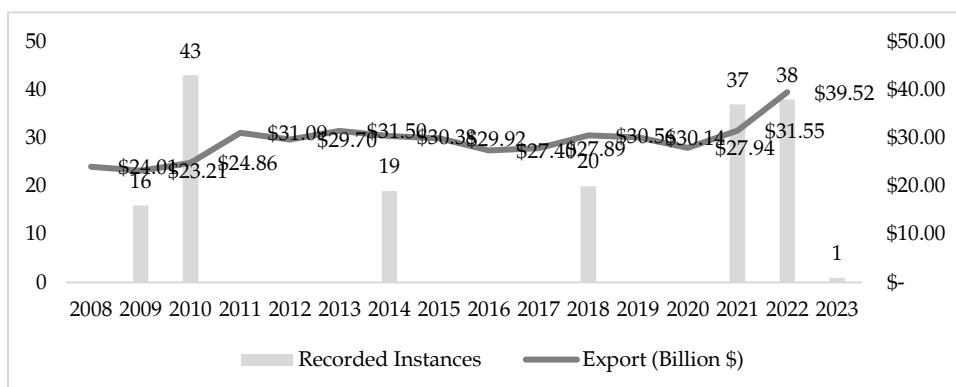
Figure 4.3 Import Tariff



Export Tax

Export taxes have not been implemented continuously over the years. The highest recorded instance for this policy was 43 in 2010, followed by 38 in 2022. From the graph, we can see that the increase in export taxes leads to a somewhat increased value of exports, suggesting that while export taxes can create revenue for the government, they may also influence export dynamics by affecting the pricing and availability of goods in international markets.

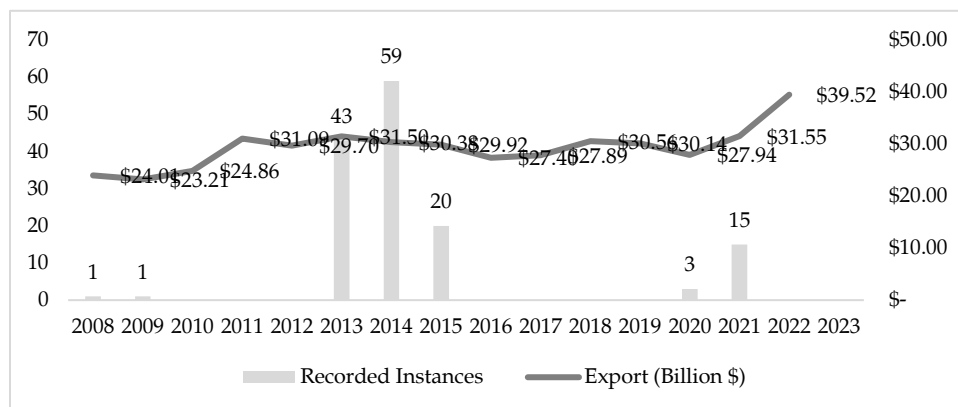
Figure 4.4 Export Tax



Trade Finance

Trade finance represents the financial instruments and products used by companies to facilitate international trade and commerce. It acts as a bridge between importers and exporters, ensuring smooth transactions. By introducing a third party, trade finance mitigates payment and supply risks. Exporters receive receivables or payment according to the agreement, while importers may be extended credit to fulfill trade orders. Various parties, including banks, trade finance companies, insurers, and export credit agencies, participate in trade finance. Unlike conventional financing, trade finance is tailored to address unique risks associated with international trade, such as currency fluctuations, political instability, non-payment issues, and creditworthiness. From the table, we cannot determine any relationship between trade finance and the export value. However, over the years, the use of trade finance as a policy for trade has reduced.

Figure 4.5 Trade Finance

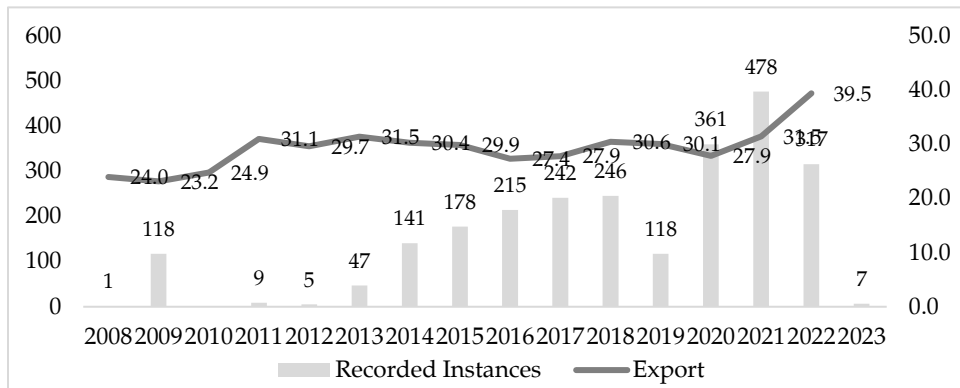


Export Promoting Policies

Export-promoting policies, including subsidies and tax incentives, play a crucial role in driving export growth and enhancing economic competitiveness. These measures aim to stimulate exports, particularly in developing economies, by reducing costs and incentivizing businesses to enter foreign markets. Additionally, trade agreements provide valuable frameworks for expanding market access and reducing trade barriers, thereby facilitating export-led growth strategies.

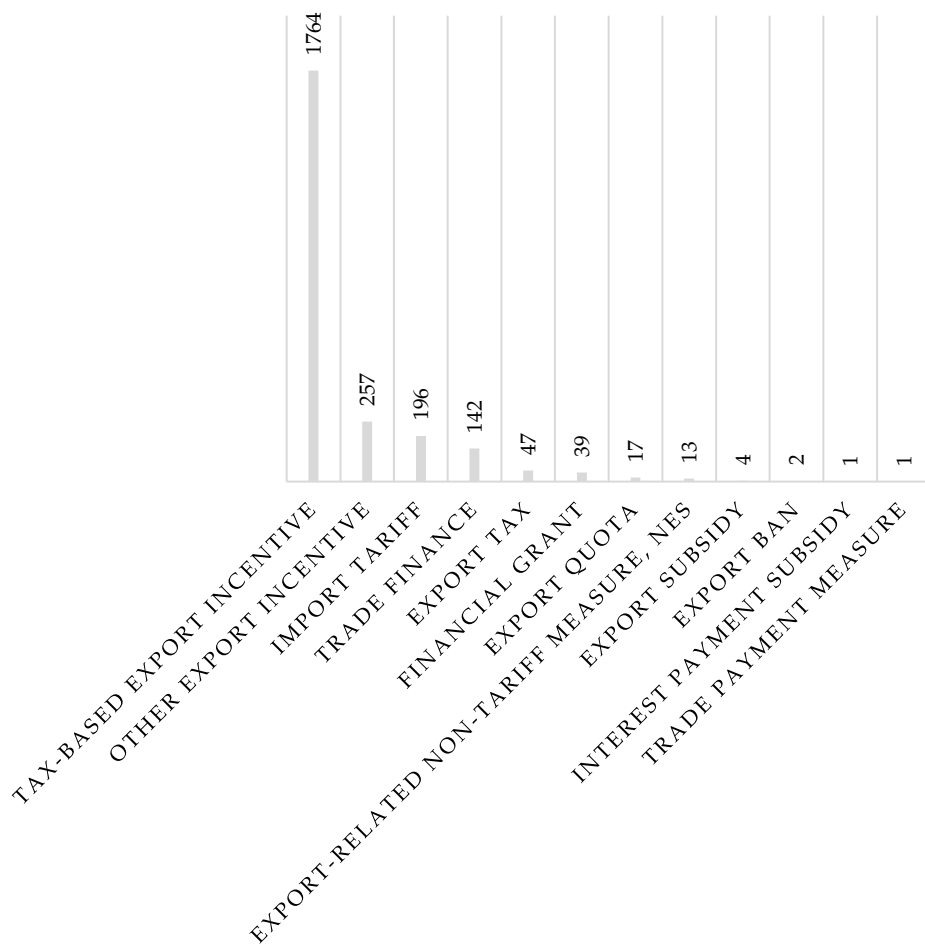
The following figure shows the recorded instances of the export-promoting policies on a yearly basis. If we compare it with the export values for Pakistan, we do see a relationship between the exports and the recorded instances in the recent years.

Figure 5.1: Export Promoting Policies (Yearly)



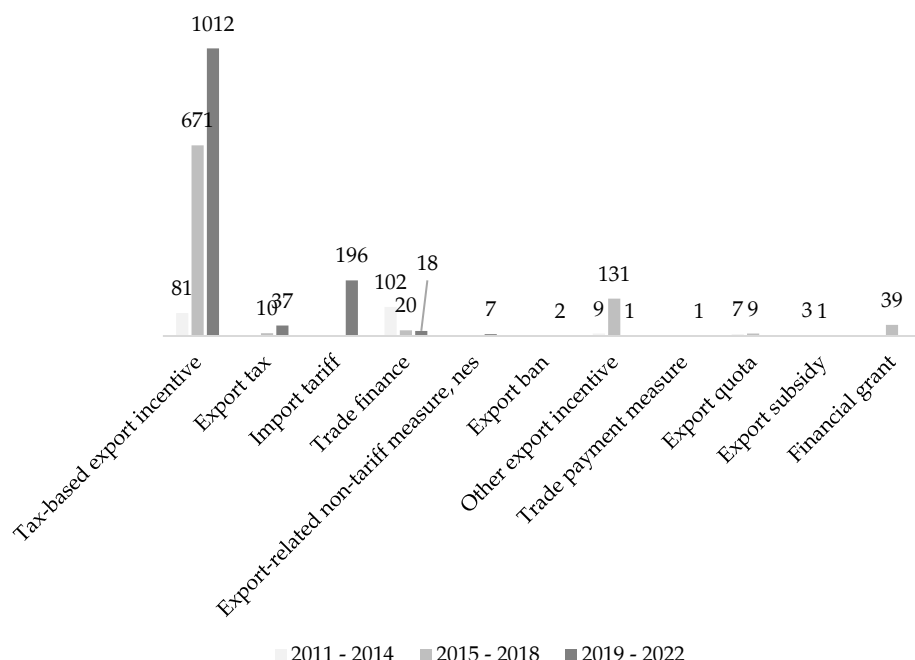
The most common export promoting policy used by Pakistan is tax-based export incentive, followed by other export incentives. Tax-based export incentives are frequently employed by developing countries as a key export promotion policy. Research by Schiff and Winters (2003) underscores the effectiveness of export tax incentives in stimulating export growth, particularly in economies with limited market access.

Figure 5.2: Export Promoting policies.



To analyze what type of policies have been used in different time periods we have divided the years into three brackets: 2011 to 2014, 2015 to 2018 and 2019 to 2022. By using these brackets, we observe that the use of tax-based export incentives and export taxes as policy measures has become more popular over the years. While the use of import tariffs as an export-promoting policy has gained popularity in recent years. In contrast, other policies mentioned in the figures have been used occasionally, with a relatively low number of implementations.

Figure 5.3: Export Promoting Policies (Time Bracket)



Export Restricting Policies

Export-restricting policies are governmental measures designed to limit or control the export of certain goods or services from a country. These policies can take various forms, such as tariffs, quotas, or outright export bans, and are typically implemented for reasons ranging from protecting domestic industries to ensuring food security or managing natural resources. Importantly, while export restrictions may provide short-term benefits for specific sectors or objectives, they can also have broader economic implications, including trade disruptions, reduced competitiveness, and potential retaliation from trading partners. As such, careful consideration of the trade-offs involved is necessary when implementing export-restricting policies.

The following figure shows the export-restricting policies on a yearly basis along with the export value for Pakistan. It appears that there is no relationship between the export-restricting policies and the export value. The major amount of export-restricting policies that were implemented occurred in 2017. Referring to Figure 5.4, we can see that the most common types of export-restricting policies implemented by Pakistan are tax-based export incentives and export-related non-tariff measures.

Figure 5.4: Export Restricting Policies (Yearly)

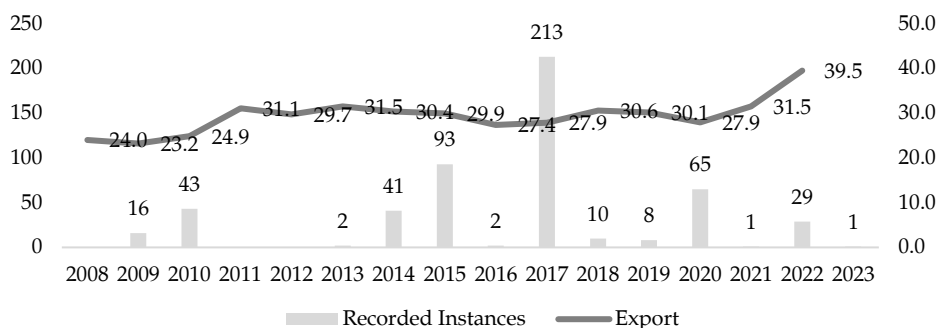
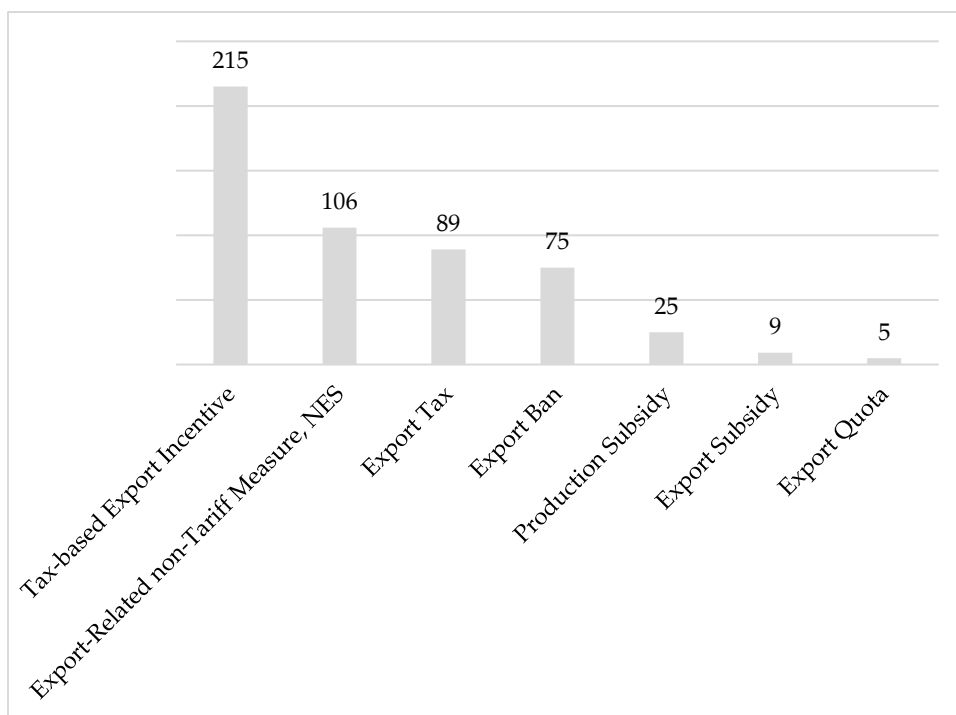
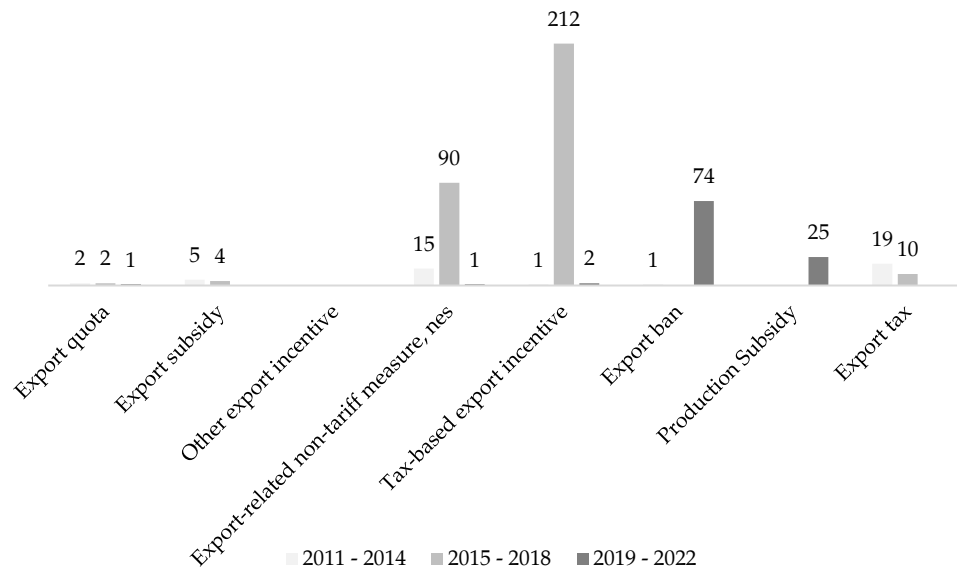


Figure 5.5: Export Restricting Policies



Dividing the data into three brackets, we can conclude that major export-restricting policies were implemented between 2015 to 2018. During the time bracket of 2019 to 2022, the major policies implemented were export ban and production subsidies.

Figure 5.6: Export Restricting Policies (Time Bracket)



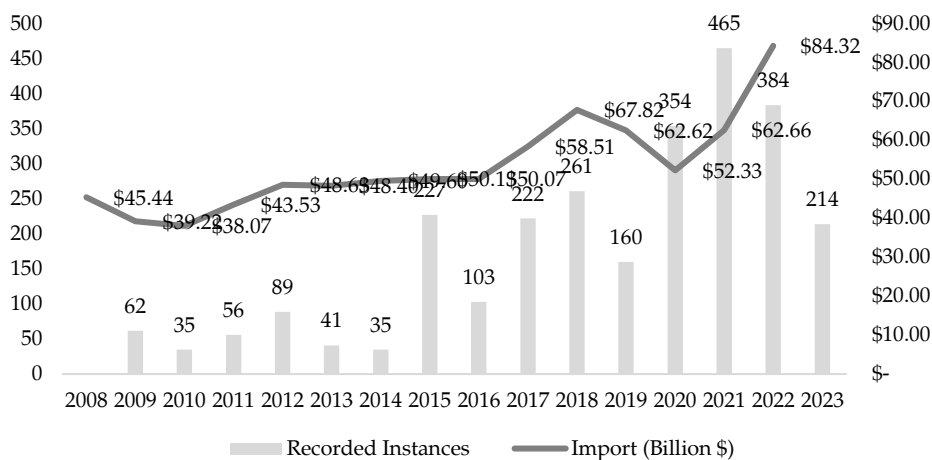
Import Policies

By analyzing the top five policies separately along with Pakistan's imports, we see some impact on the imports for certain policies. Figures 6.1 to 6.5 illustrate the data for these policies.

Import Tariff

Import tariff has been used in Pakistan as a policy measure since 2009, with fluctuations in the recorded instances over the years. However, it has recently gained momentum.

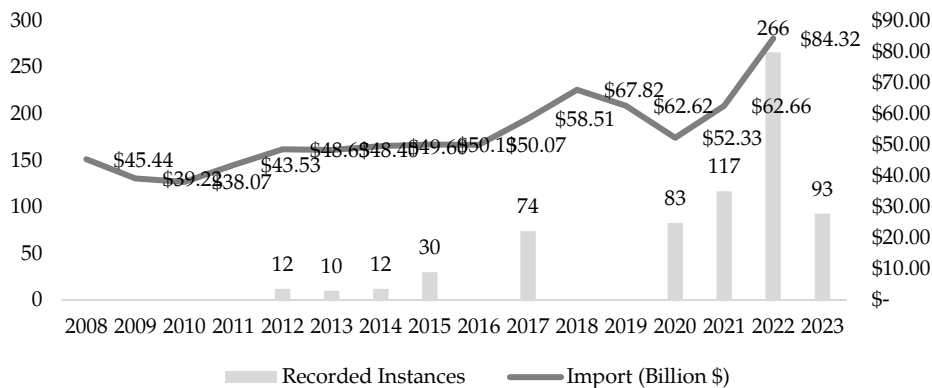
Figure 6.1 Import Tariff



Internal Taxation of Imports

Internal taxation of imports refers to taxes or charges levied within a country's borders specifically on imported goods. These taxes impact the cost and competitiveness of imported products in the domestic market. Article III of the General Agreement on Tariffs and Trade (GATT) ensures that imported goods are not subject to discriminatory treatment compared to domestic products. It prohibits using internal taxes or charges to protect domestic production, emphasizing fairness and non-discrimination in international trade agreements. The use of internal taxation of imports as a policy measure has increased over the recent years.

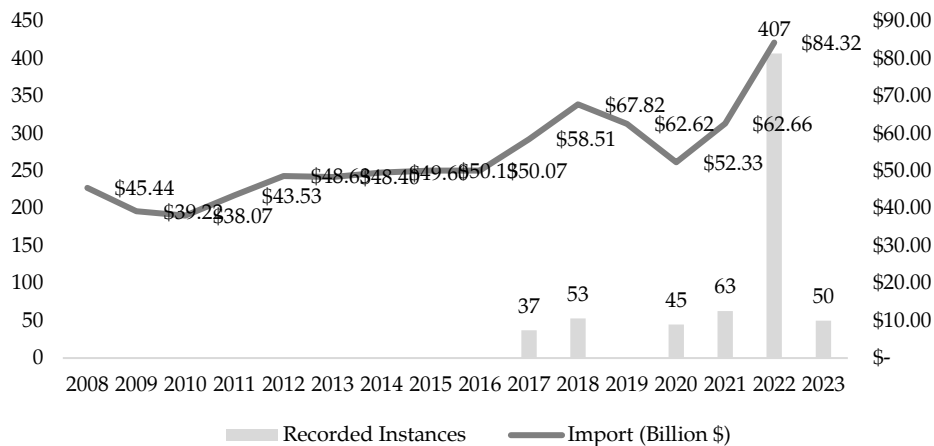
Figure 6.2 Internal taxation of imports



Trade Payment Measure

From the illustration, we can imply that as the trade payment measures increase, the import value of Pakistan also increases.

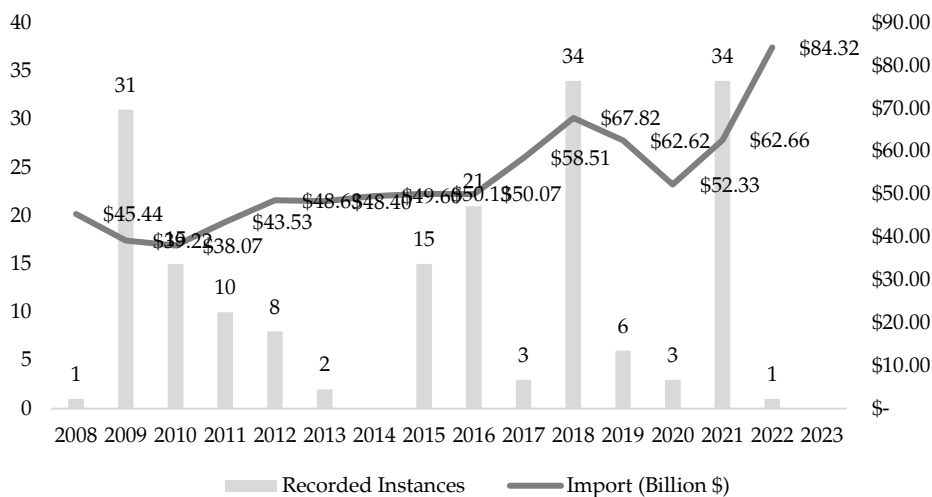
Figure 6.3 Trade Payment Measure



Anti-dumping

Anti-dumping duties are protectionist tariffs imposed by a domestic government on foreign imports believed to be priced below fair market value. The process of dumping occurs when a company exports a product at a significantly lower price than it normally charges in its home market. The rationale behind anti-dumping duties is to protect the domestic economy by preventing products from undercutting local businesses and the overall economy. However, these tariffs can also lead to higher prices for domestic consumers. There is considerable fluctuation in the imposition of anti-dumping policies.

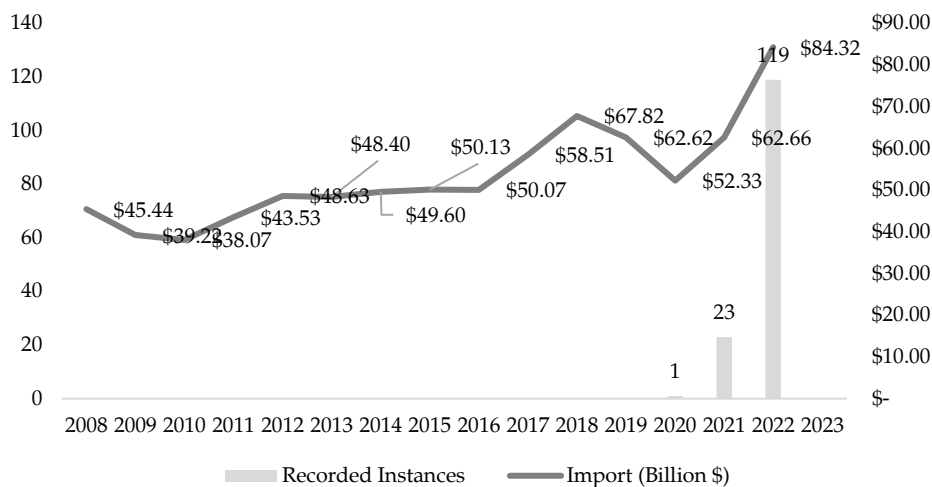
Figure 6.4 Anti-dumping policies



Import Licensing Requirement

From the graph, we can assess that import licensing requirement has been used as a policy measure quite recently.

Figure 6.5 Import Licensing Requirement



Import Promoting Policies

Import-promoting policies are strategies employed by governments to encourage and facilitate the import of goods and services into a country. These policies aim to enhance economic efficiency, promote consumer choice, and stimulate domestic industries by providing access to foreign inputs, technologies, and resources. Import-promoting measures can include tariff reductions, import quotas, free trade agreements, and streamlined customs procedures. By lowering barriers to imports, governments seek to promote competition, drive innovation, and improve the availability and affordability of goods for consumers.

Import-promoting policies are often implemented as part of broader trade liberalization efforts aimed at integrating economies into the global marketplace and maximizing welfare gains from international trade. The figure below shows the number of recorded instances for import promoting policies over the years alongside the import value of Pakistan. We observe a relationship between the recorded instances and import value.

Figure 7.1: Import Promoting Policies (yearly)

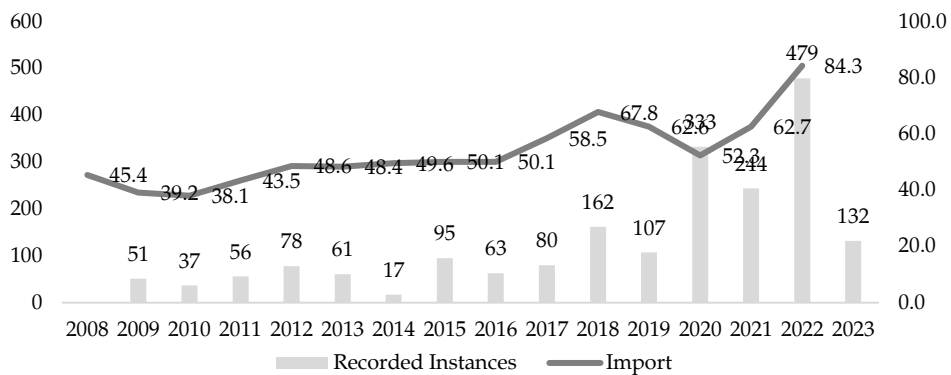
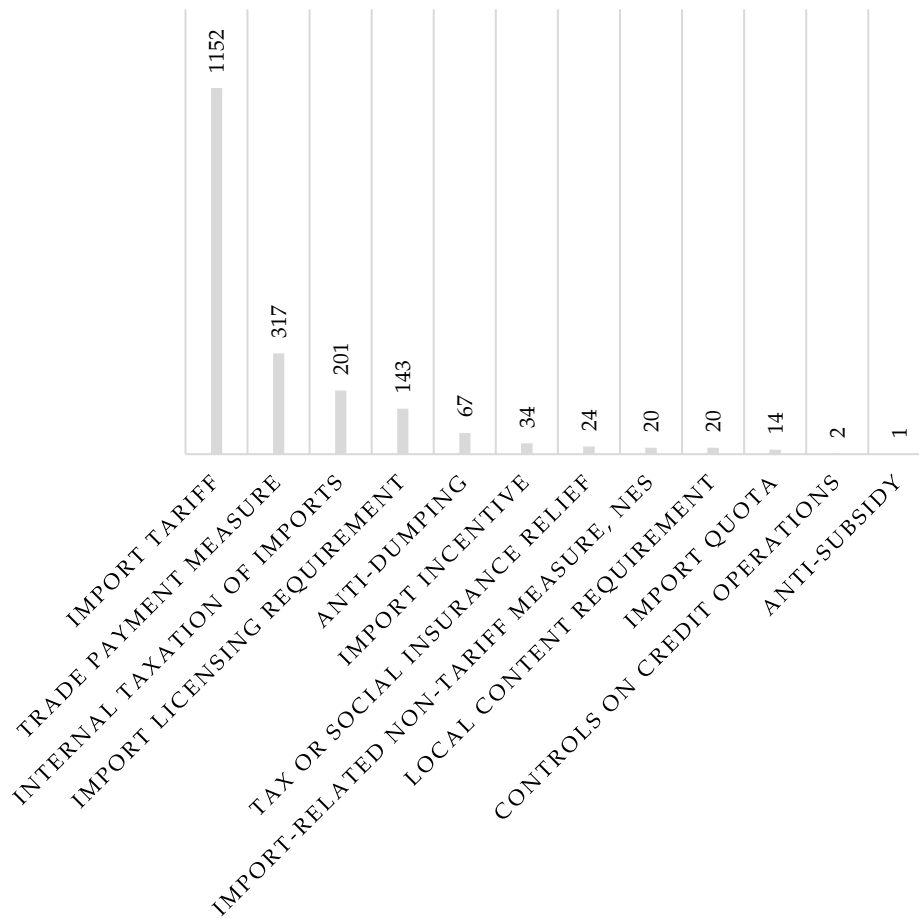
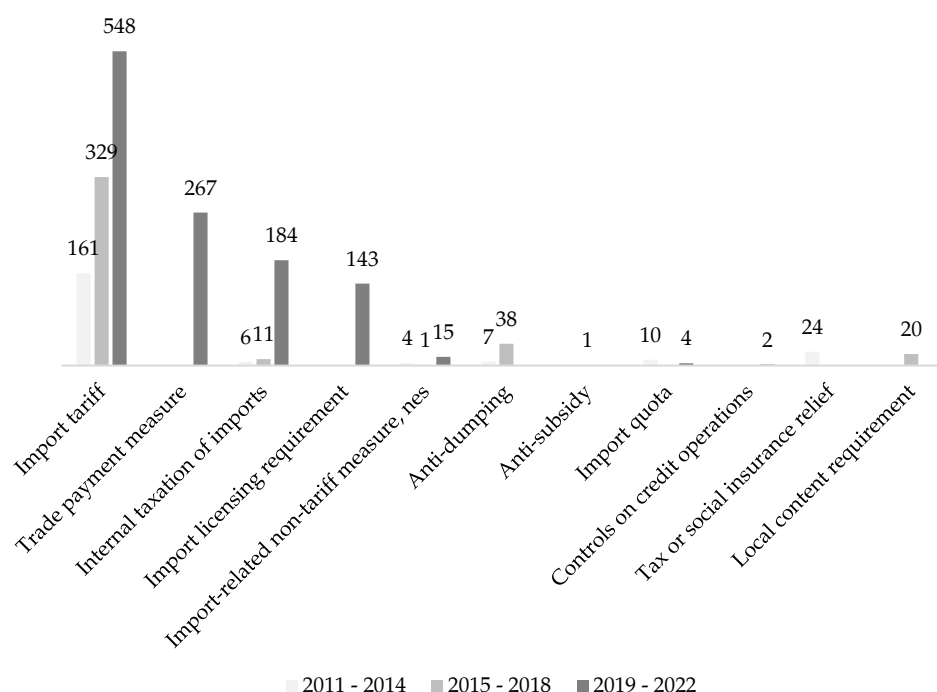


Figure 7.2: Import Promoting Policies



The figure below shows that the use of import tariffs as a policy measure has increased over the years. During the period from 2019 to 2022, new import promoting policies have been implemented extensively, including trade payment measures, internal taxation of imports and import licensing requirements.

Figure 7.3: Import Promoting (Time Bracket)



Import Restricting Policies

Import-restricting policies are government interventions designed to limit or control the inflow of foreign goods and services into a country. These policies are implemented through various measures such as tariffs, quotas, import licensing requirements, and trade embargoes. Import restrictions are often motivated by the desire to protect domestic industries from foreign competition, safeguard national security interests, or address trade imbalances.

However, while import restrictions may provide short-term relief for domestic producers, they can also lead to higher prices for consumers, reduced product variety, and inefficiencies in resource allocation. Moreover, import restrictions may provoke retaliation from trading partners and hinder overall economic growth by disrupting global supply chains. Therefore, policymakers must carefully consider the trade-offs involved in implementing import-restricting policies to ensure they align with broader economic objectives and international trade obligations.

From the graph below, we can see that during recent years, the use of import restriction policies has increased. We also observe a lag effect in the imposition of these policies.

Figure 7.4: Import Restricting (Yearly)

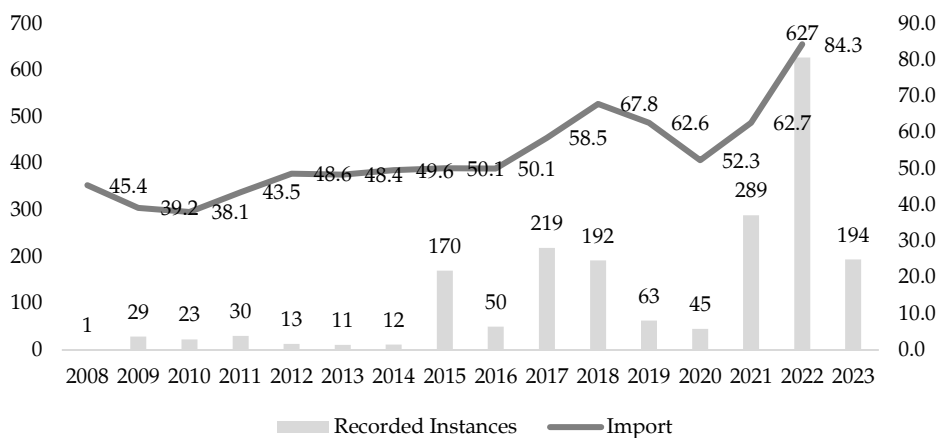
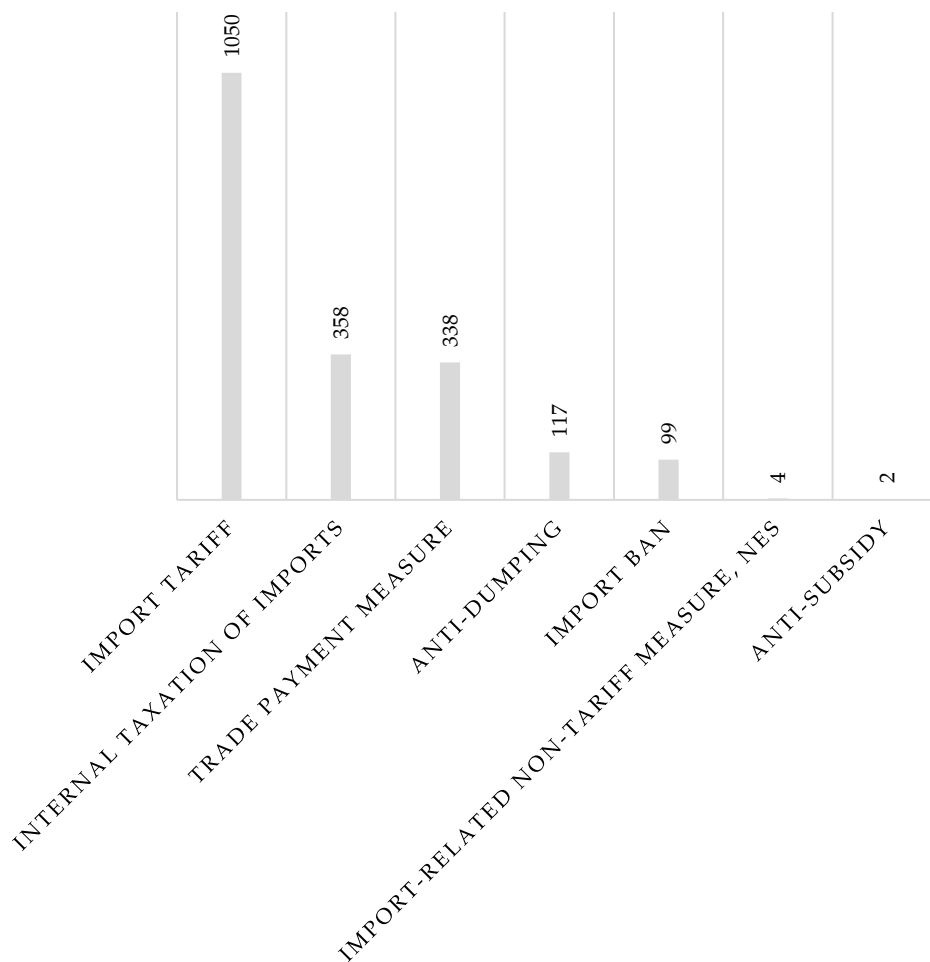
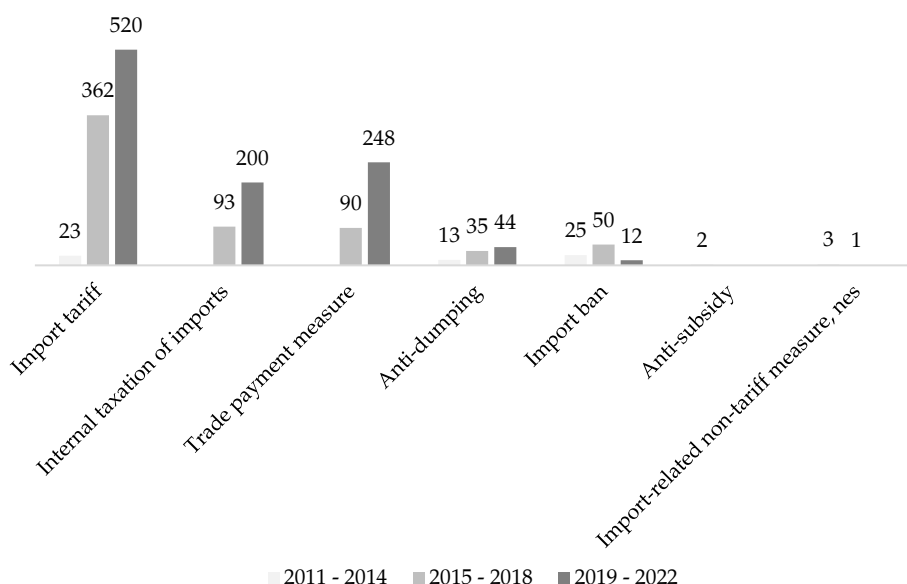


Figure 7.5: Import Restricting



The use of import tariff, internal taxation of imports and trade payment measure as an import restriction policy measure has increased drastically during 2019 to 2022.

Figure 7.6: Import Restricting (Time Bracket)



Recommendation:

Rationalizing Import Tariffs:

The existing tariff system in Pakistan is perceived as restrictive and unfavorable to economic expansion, particularly for industries that depend on imported capital goods and raw materials. High tariffs on these essential inputs increase production costs, reducing the competitiveness of local products in the international market. To prevent unforeseen market disruptions and allow industries sufficient time to adjust to new competitive conditions, a progressive reduction plan with predetermined timetables is proposed to systematically lower these tariffs. This policy should concentrate on lowering tariffs in a manner that is consistent with Pakistan's larger economic strategy, ensuring that tariff reductions support the expansion of industries deemed strategically important to national interests,

Promoting Export-Oriented Industrial Policies

Pakistan has to find and invest in industries with a significant comparative advantage or great potential for value addition if it wants to develop a strong export industry. For instance, Pakistan's agricultural and textile industries have long been its mainstays, but they now need to be modernized and integrated into international value chains. By offering targeted assistance, such as financial incentives for research and development, subsidies for adopting cutting-edge technologies, and special

Understanding the Nature of Pakistan's trade policies and testing their impact on Pakistan's trade performance

economic zones with amenities and regulatory frameworks catered to these industries' requirements, the government can promote the growth of these sectors. Pakistan may boost its export numbers and trade balance by fostering an atmosphere that encourages industry growth.

Enhancing Export Incentives

Providing Pakistan with export incentives that work is essential for improving its trade performance. To assist exporters more effectively, existing programs like tax breaks and the Duty Drawback Scheme should be improved and expanded. For example, simplifying the process for exporters to claim duty deductions would encourage more participation in this incentive and lower their operating costs. Additionally, direct subsidies for technological advancements could help local producers meet international standards and enhance their competitiveness in global markets. Such incentives not only support current exporters but also attract new ones, making the export industry more vibrant.

Strengthening Trade Facilitation Measures

The main goal of trade facilitation measures is to increase the effectiveness and streamline the import and export procedures. The current logistical constraints impeding Pakistan's trading potential might be greatly reduced by improving port facilities and customs efficiencies. Modern methods for cargo handling and customs clearance can cut down on the time that items spend in transit, thereby reducing expenses and enhancing supply chain predictability. The efficiency of trade procedures can be further improved by using international best practices and providing customs officials with training. These upgrades are essential for increasing Pakistan's appeal as a trading partner and enabling easier market access and departure.

By addressing these areas comprehensively, Pakistan can develop a trade environment that is not only conducive to growth but also resilient enough to adapt to global economic changes. This strategic approach to trade policy can help Pakistan capitalize on its geographic and economic strengths, turning the challenges of today's global trade environment into opportunities for growth and development.

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Understanding the Nature of Pakistan's trade policies and testing their impact on Pakistan's trade performance

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Appendix A

Number of state acts and recorded instances by intervention type on a yearly basis

Figure 1.1

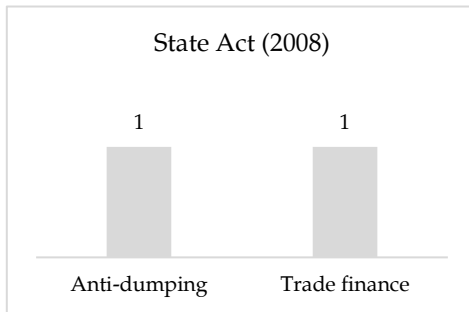


Figure 2.1



Figure 1.2

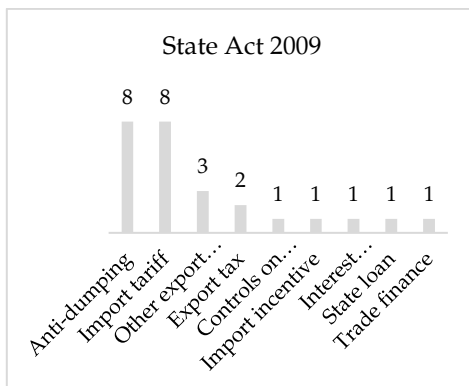


Figure 2.2

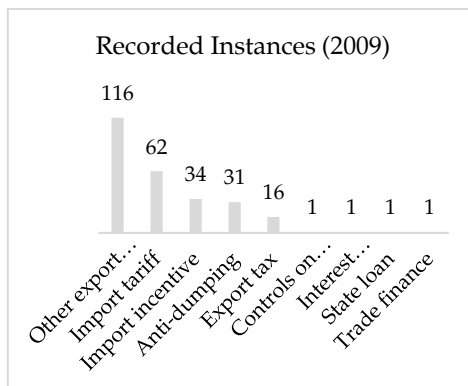


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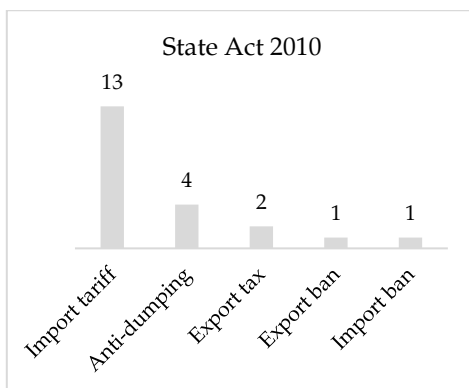


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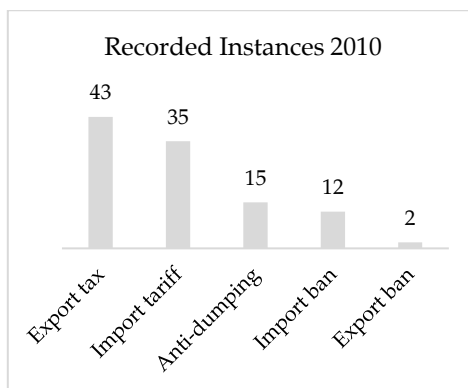


Figure 1.4

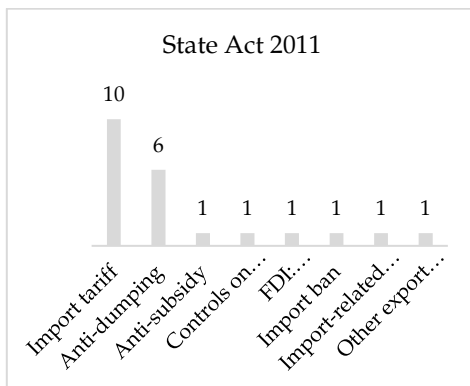


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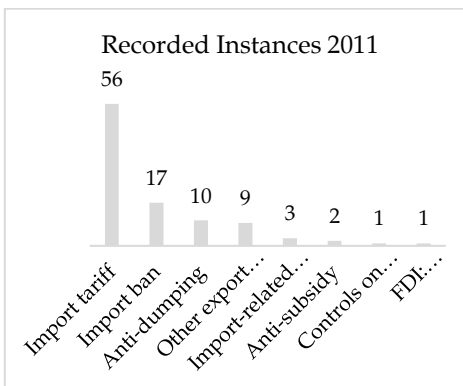


Figure 1.5

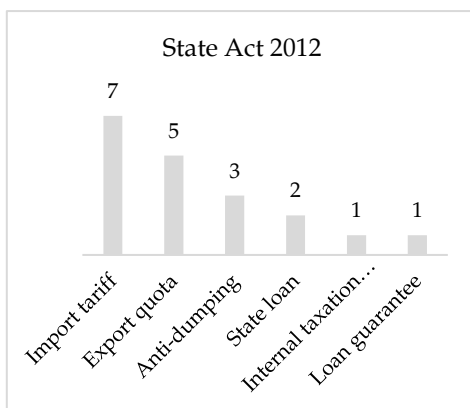


Figure 2.5

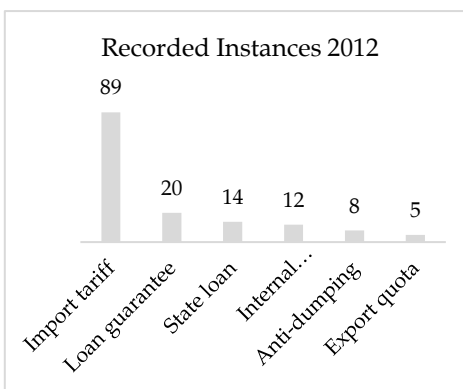


Figure 1.6

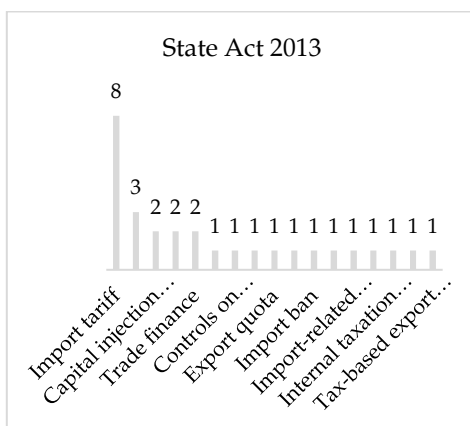


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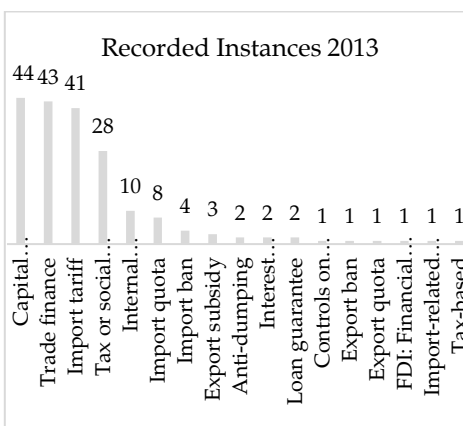


Figure 1.7

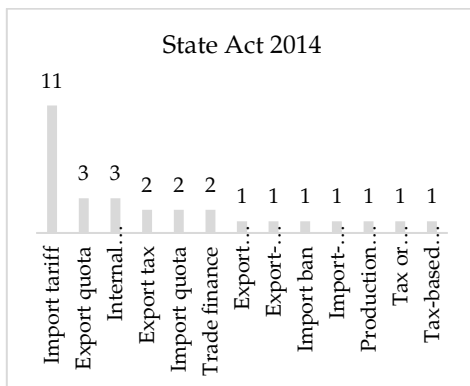


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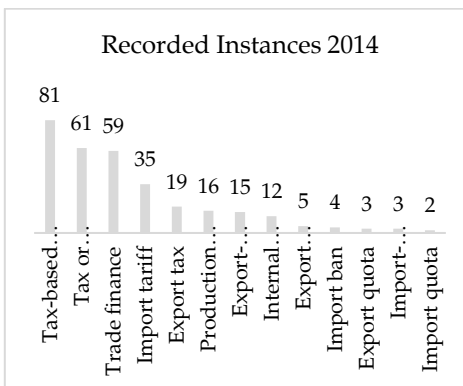


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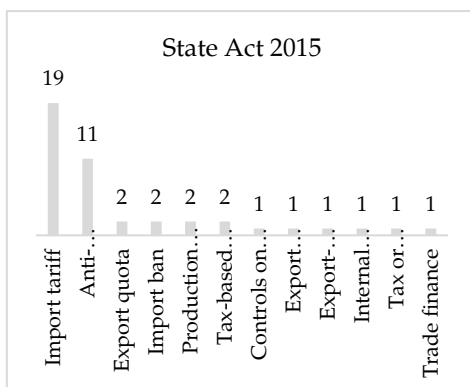


Figure 2.8

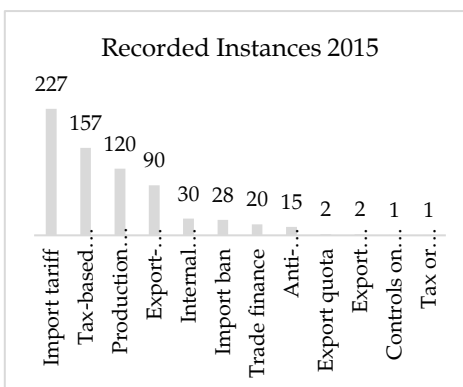


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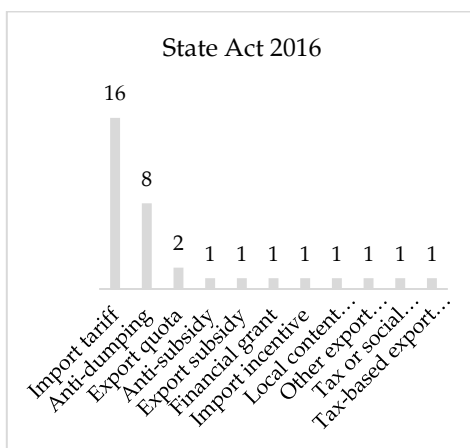


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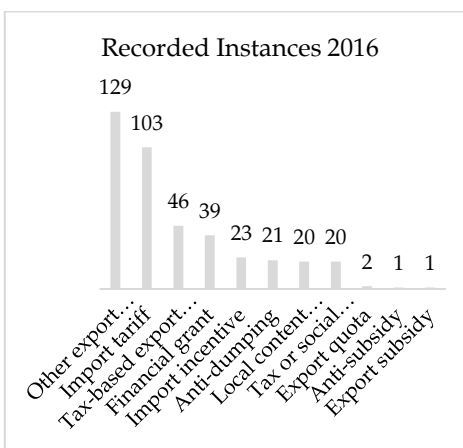


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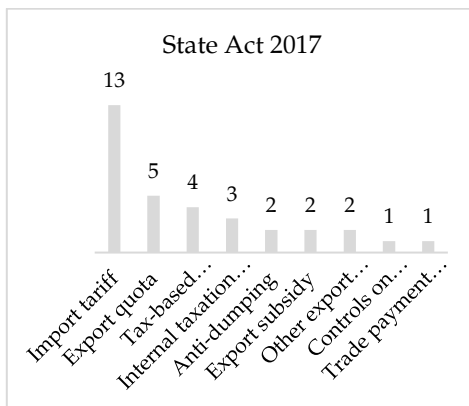


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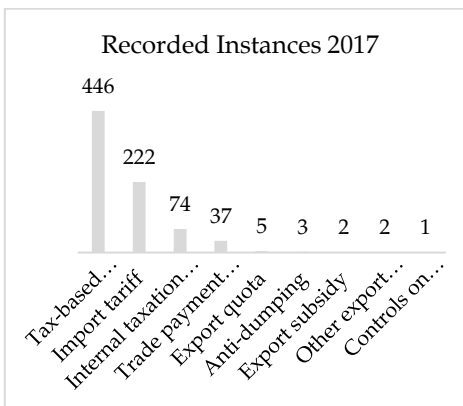


Figure 1.11

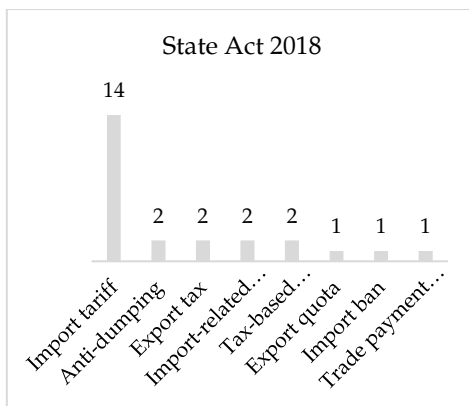


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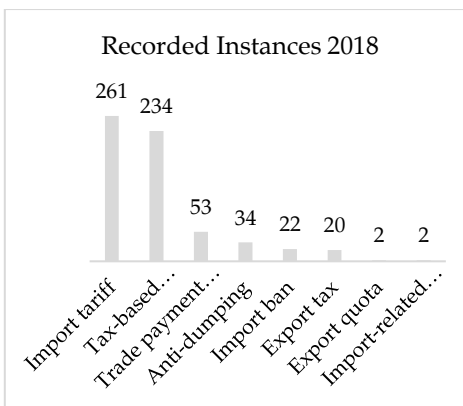


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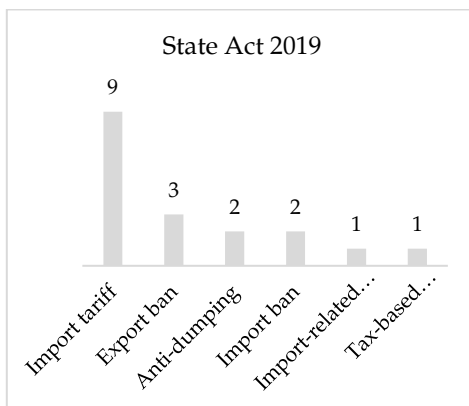


Figure 2.12

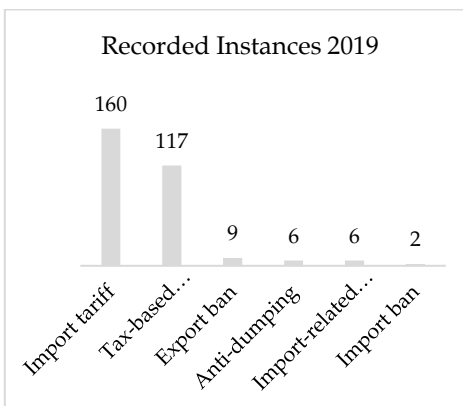


Figure 1.13

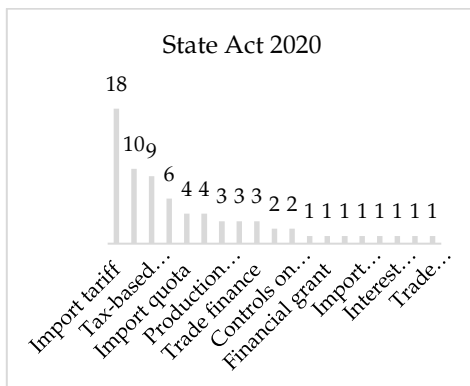


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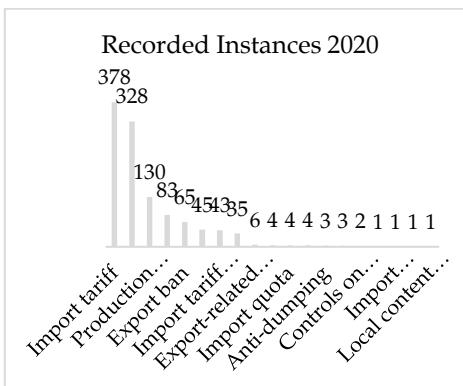


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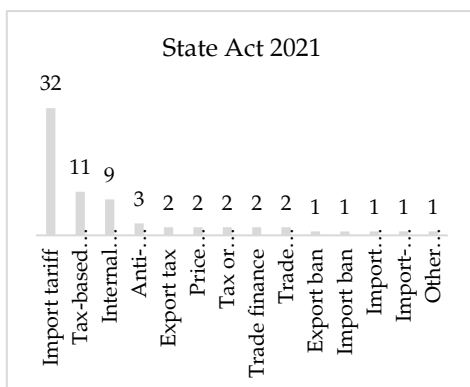


Figure 2.14

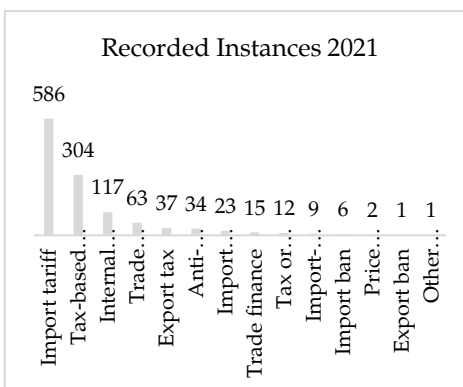


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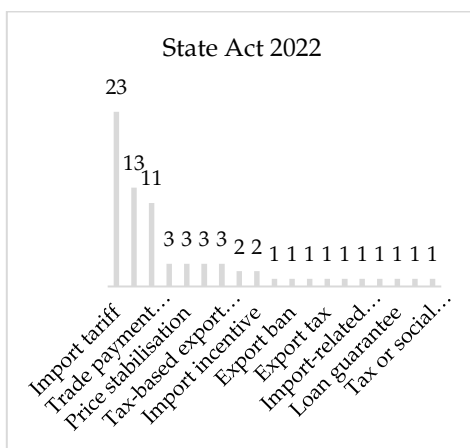


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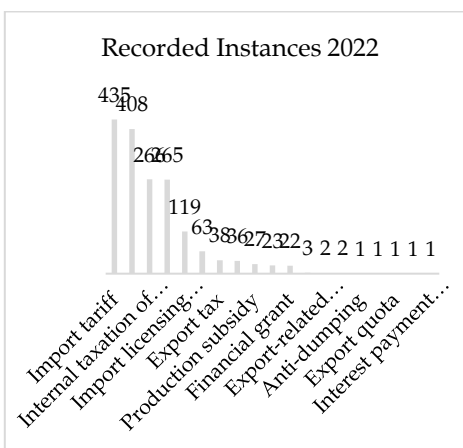


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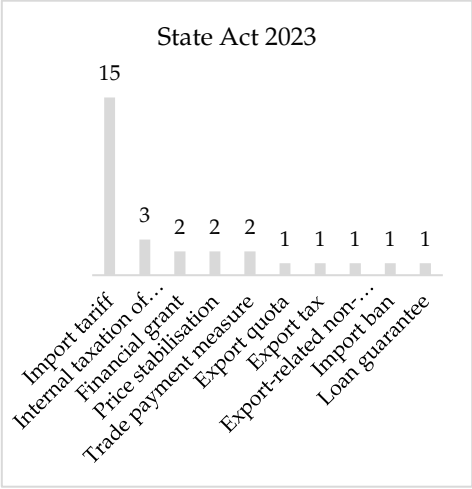
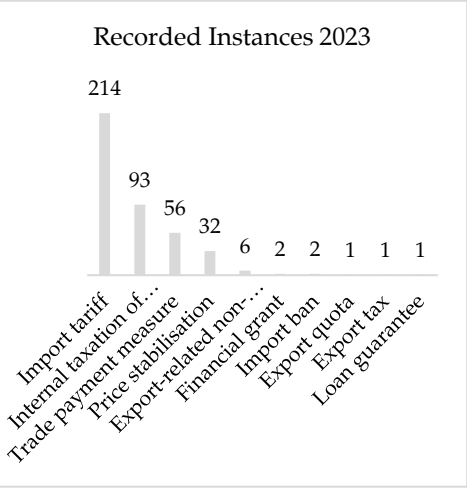


Figure 2.16



Appendix B

Export Promoting Policies on a yearly basis

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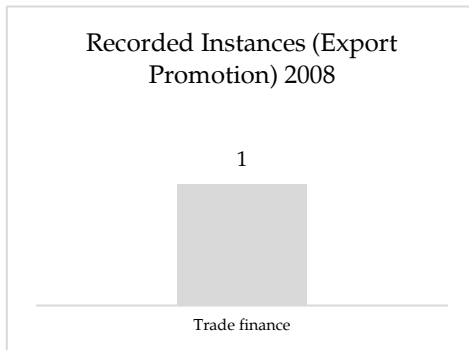


Figure 3.2

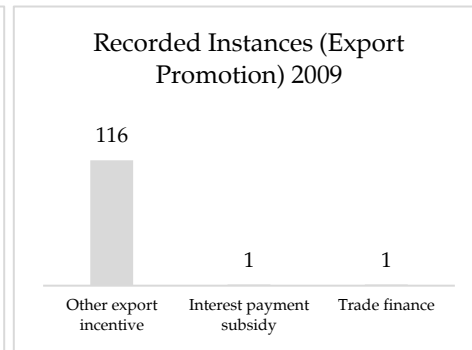


Figure 3.3

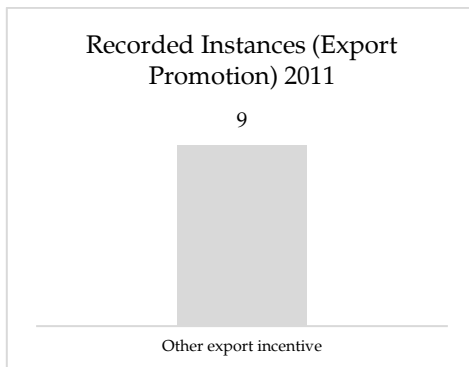


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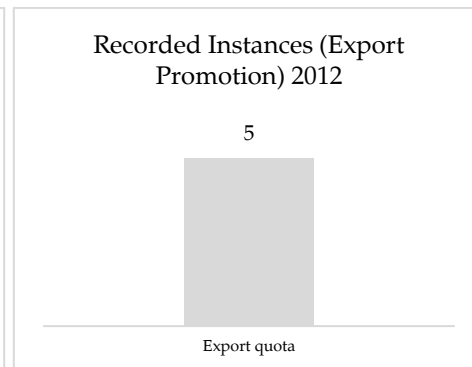


Figure 3.4

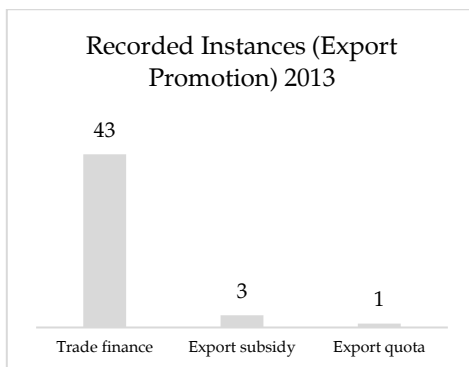


Figure 3.5

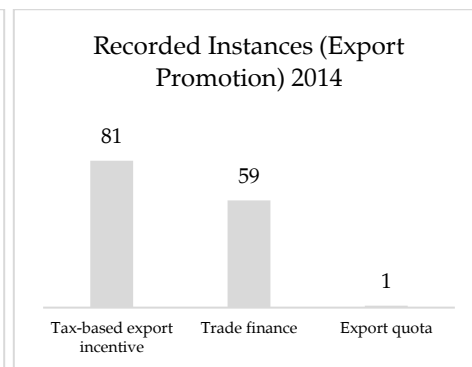


Figure 3.6

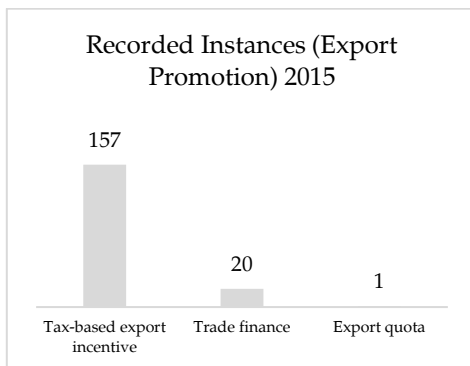


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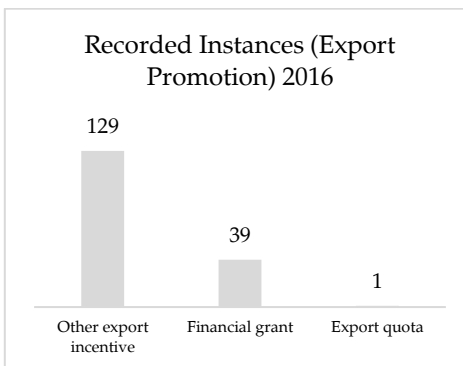


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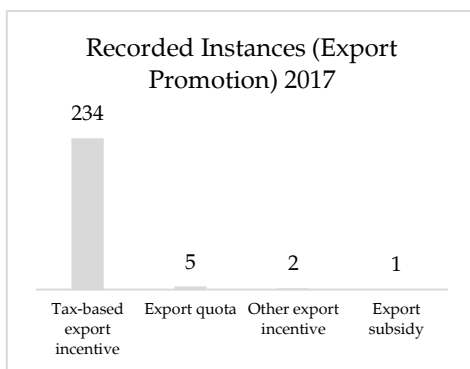


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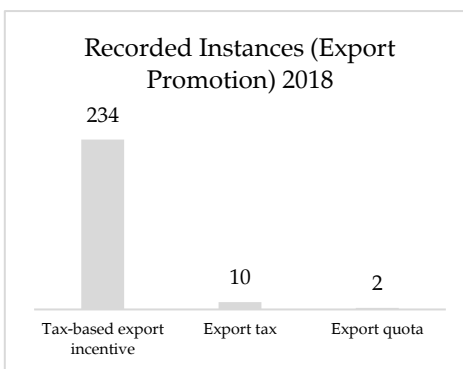


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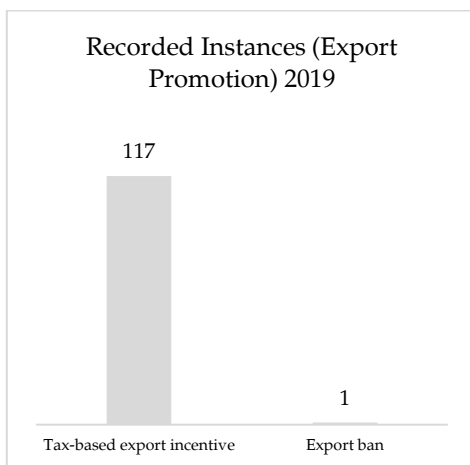


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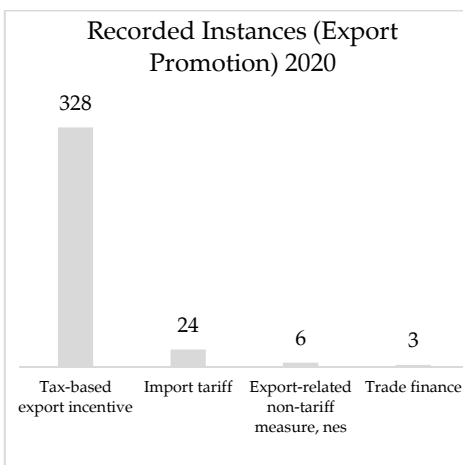


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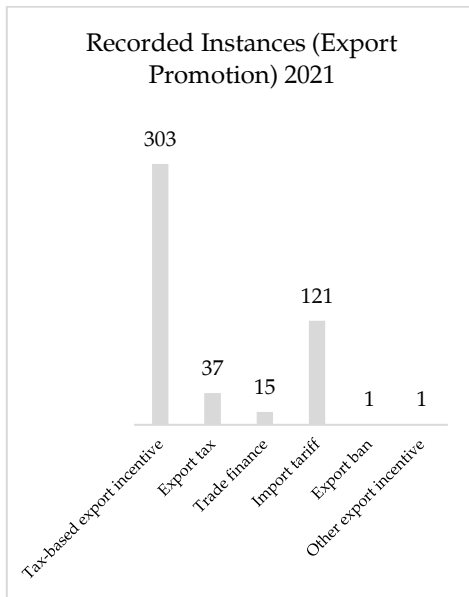


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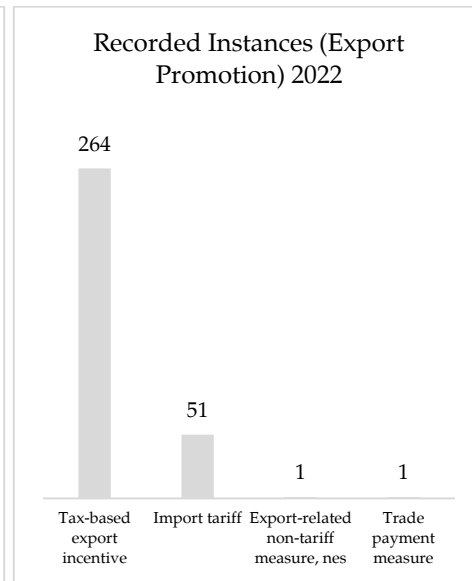
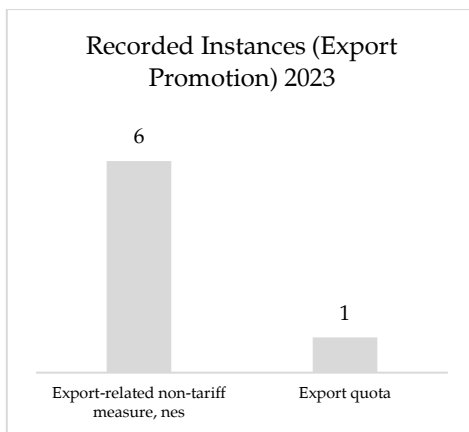


Figure 3.14



Export Restricting policies on a yearly basis

Figure 4.1

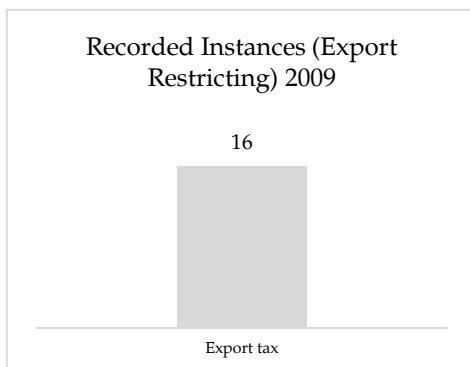


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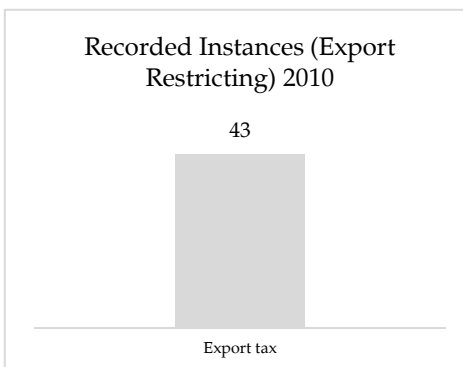


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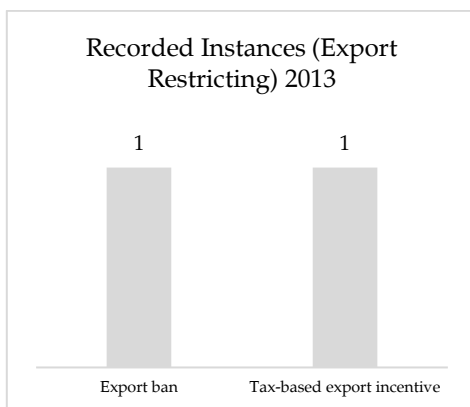


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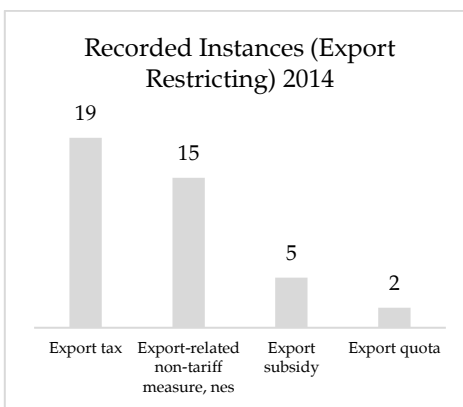


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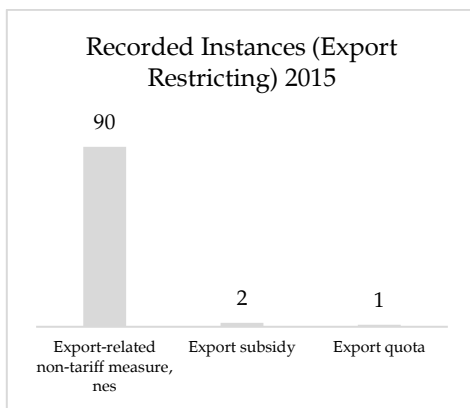


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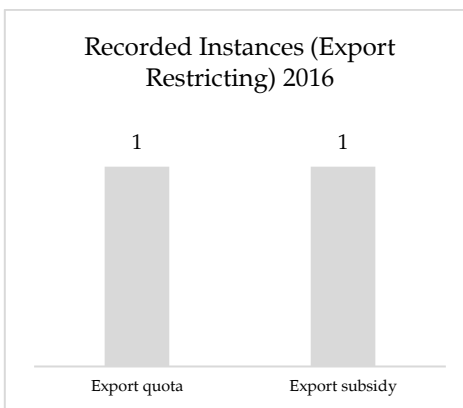


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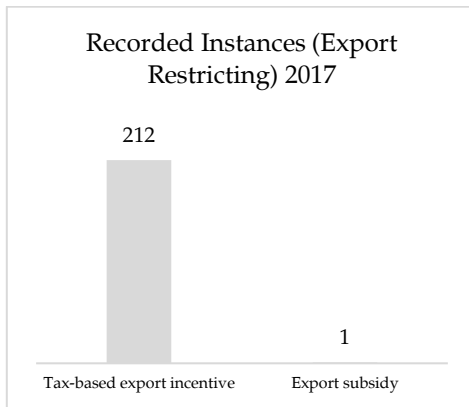


Figure 4.8

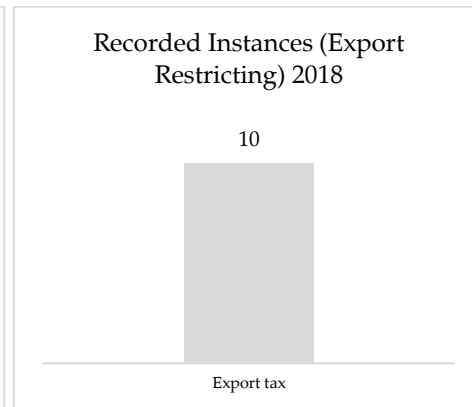


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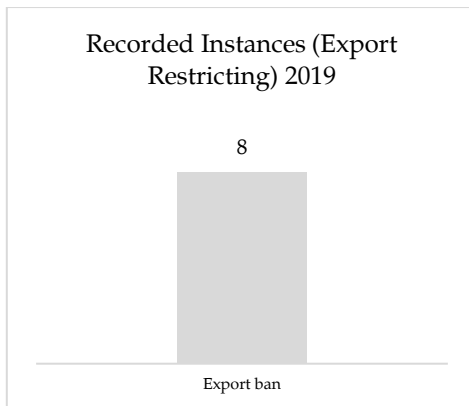


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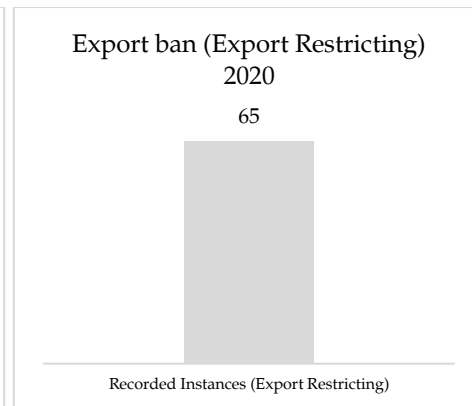


Figure 4.11

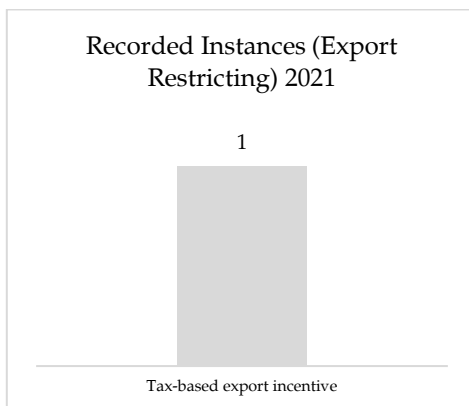


Figure 4.12

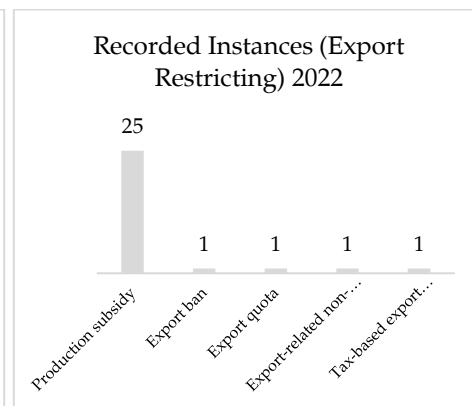
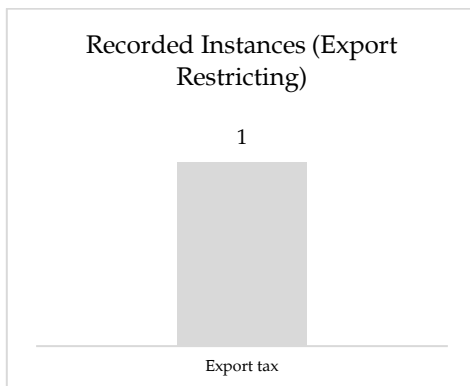


Figure 4.13



Import Promoting Policies on a yearly basis.

Figure 5.1

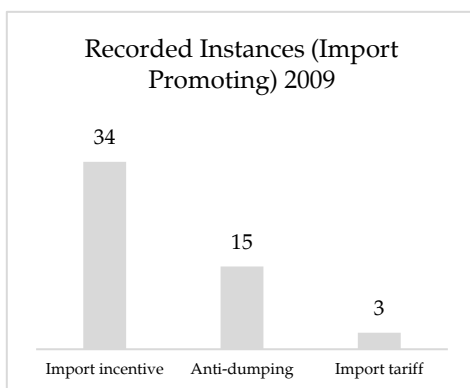


Figure 5.2

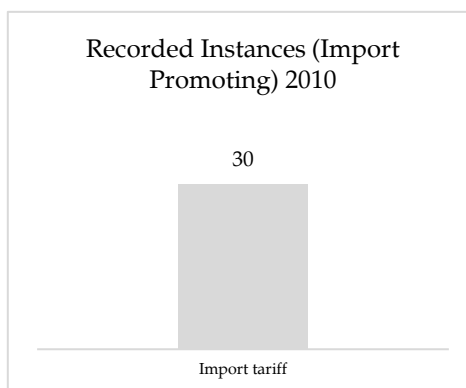


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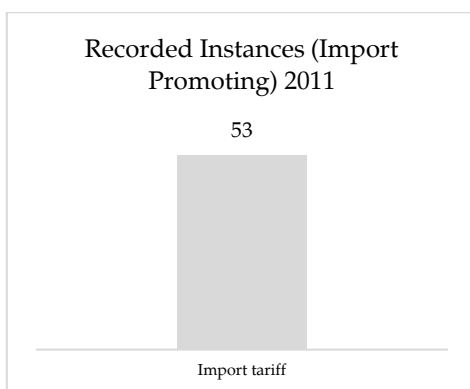


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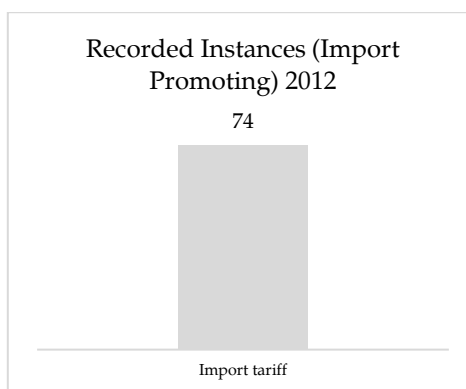


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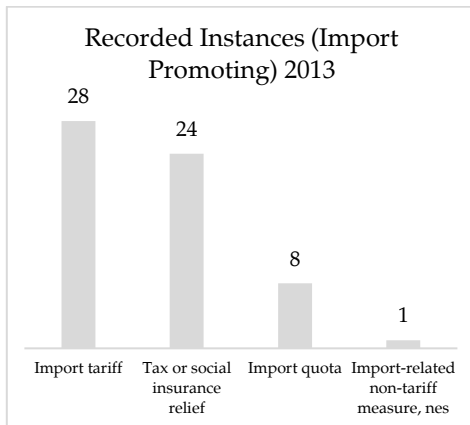


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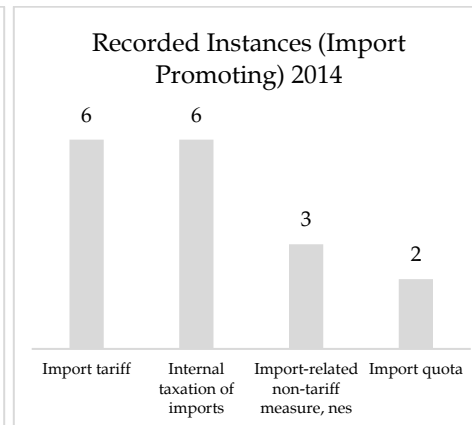


Figure 5.6

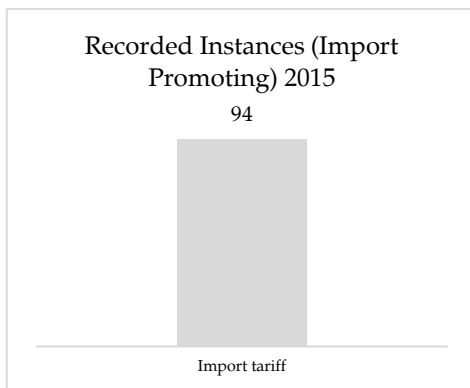


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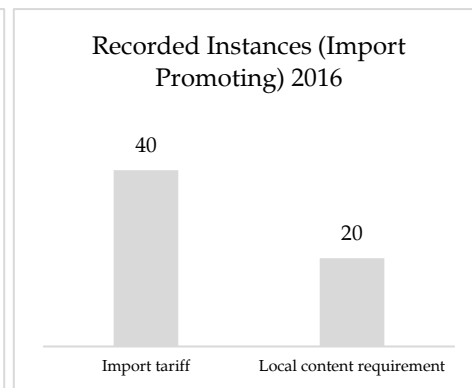


Figure 5.18

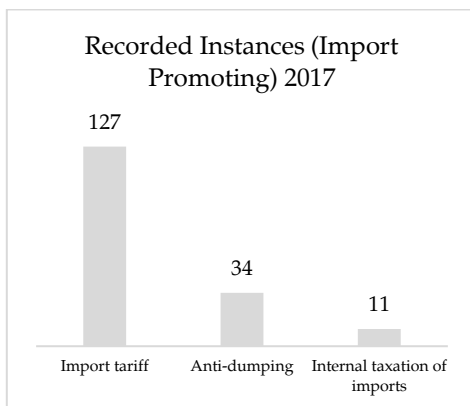


Figure 5.9

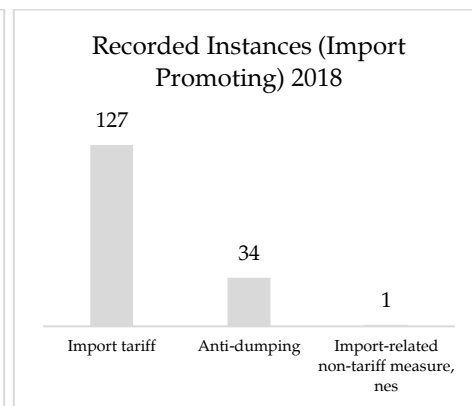


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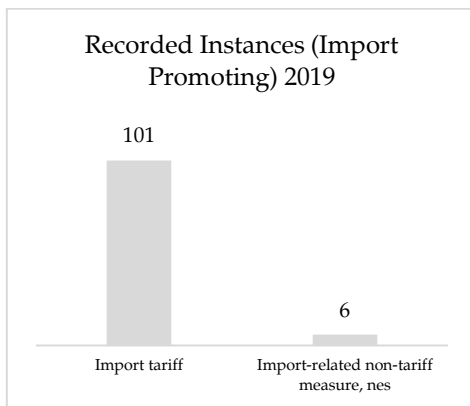


Figure 5.11

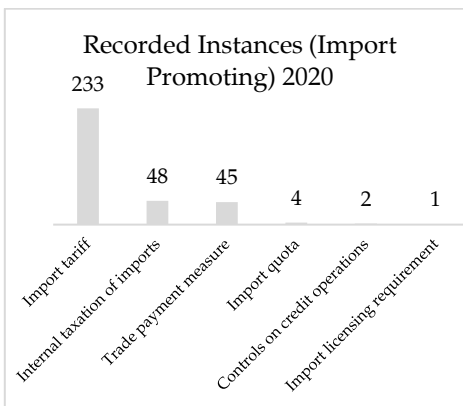


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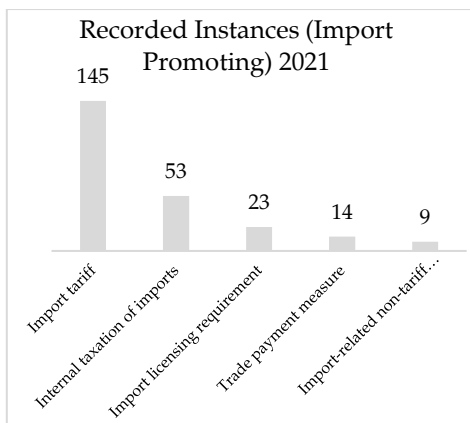


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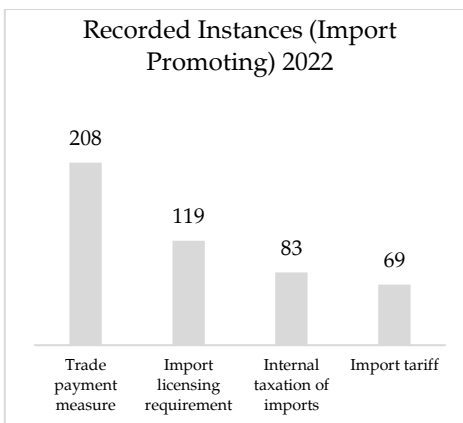
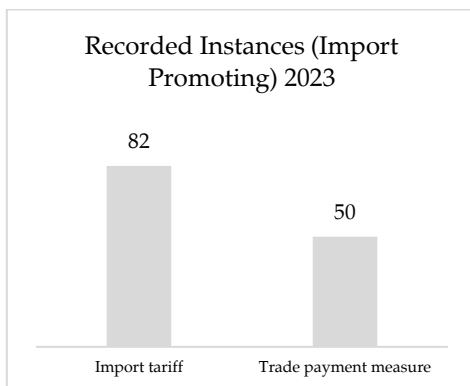


Figure 5.14



Import Restricting Policies on a yearly basis.

Figure 6.1

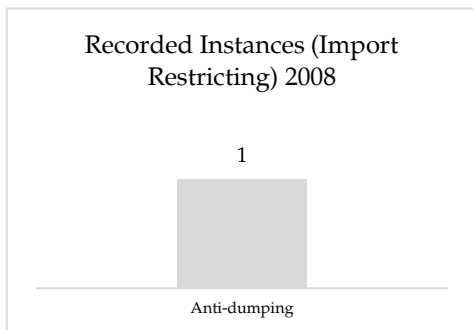


Figure 6.2

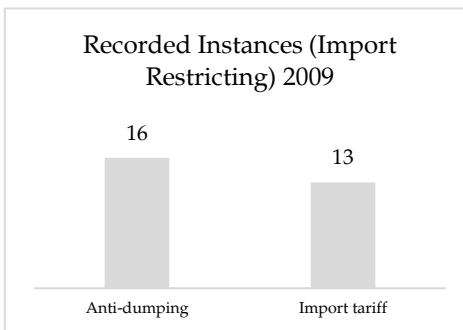


Figure 6.3

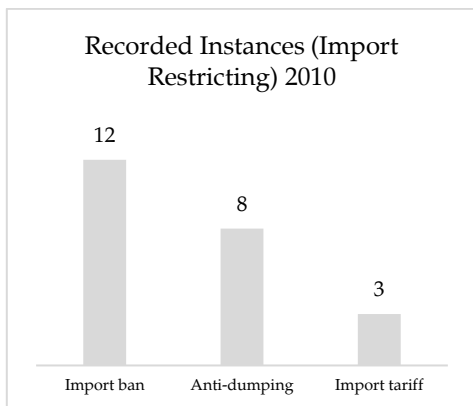


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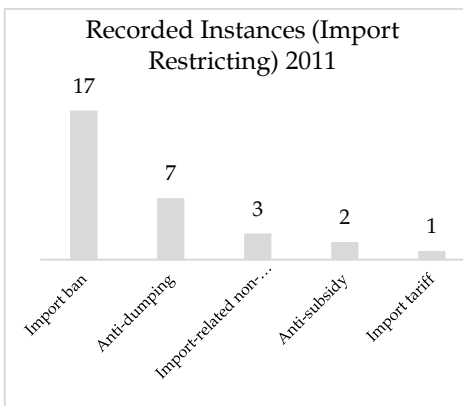


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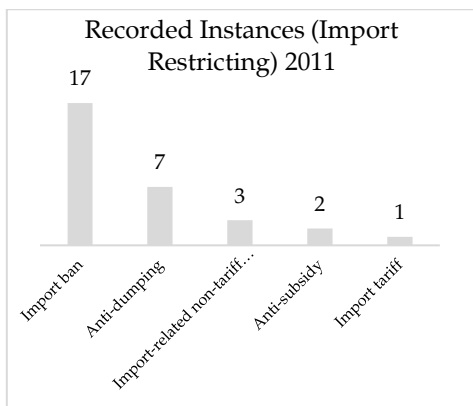


Figure 6.6

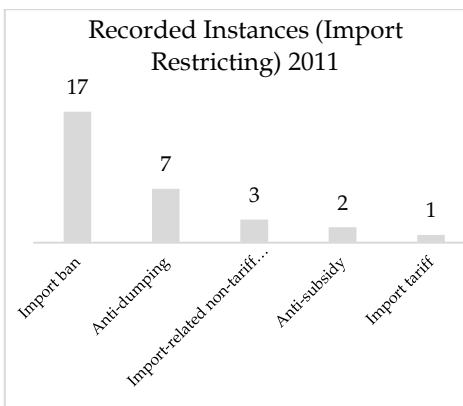


Figure 6.7

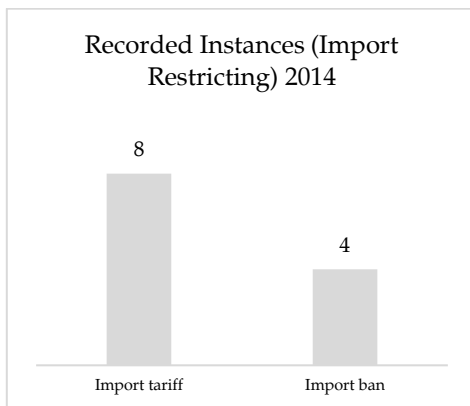


Figure 6.8

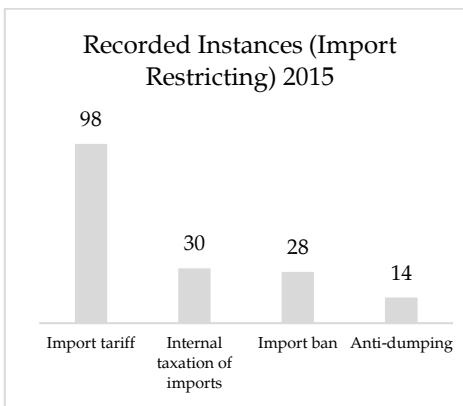


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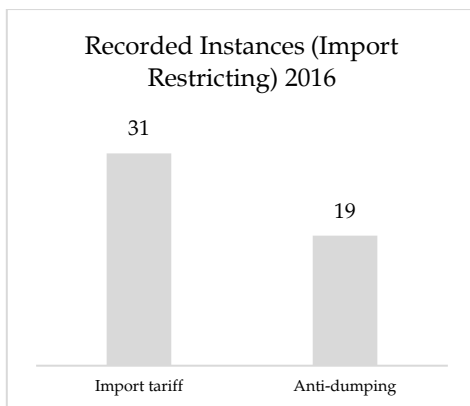


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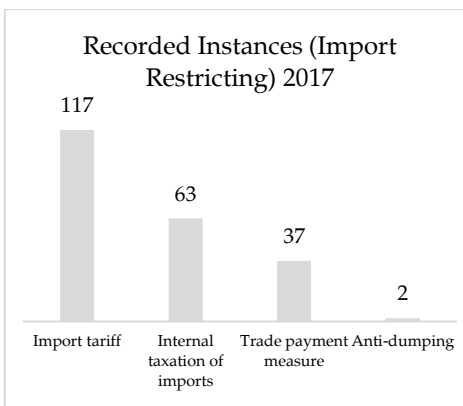


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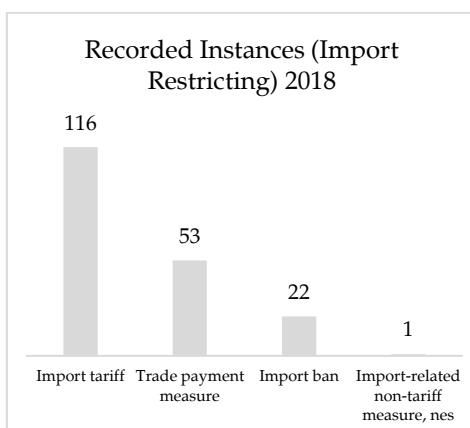


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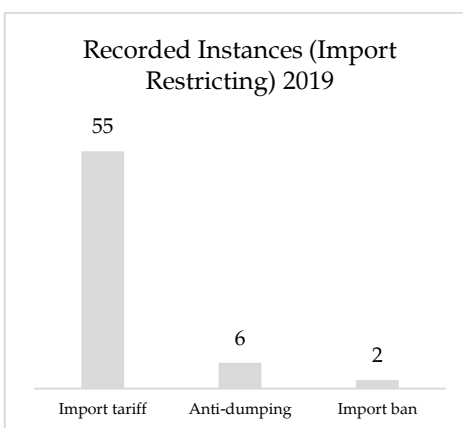


Figure 6.13

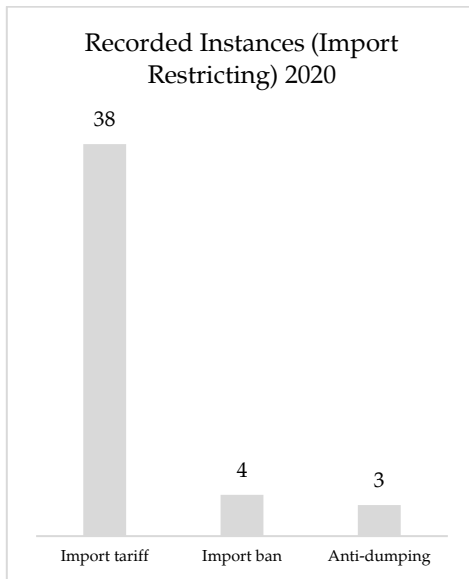


Figure 6.14

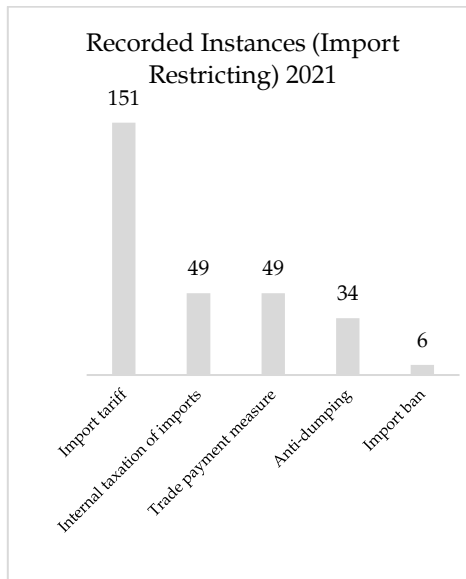


Figure 6.15

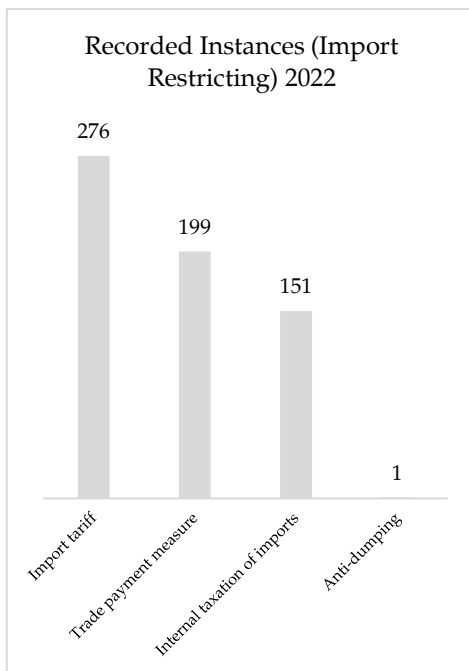
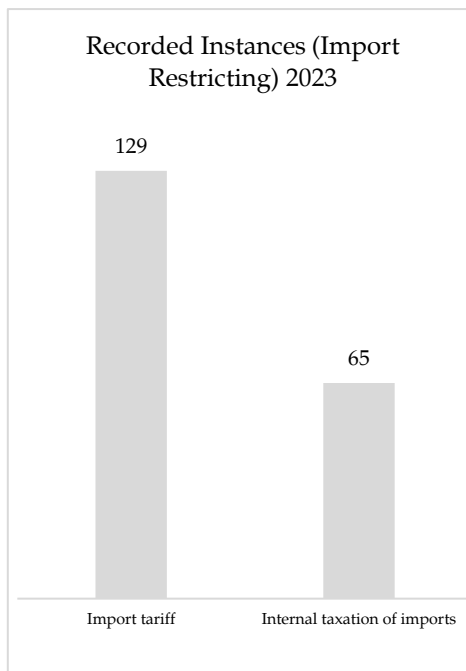


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Firms, International Trade, and the Environment in Pakistan

Theresa Thompson Chaudhry¹ and Nida Jamil²

Abstract

According to the World Trade Organization (WTO, 2021), international trade—including the production and transportation of manufactured goods—accounts for 20 to 30 percent of global greenhouse gas (GHG) emissions. This study examines the relationship between firms, international trade, and the environment, focusing specifically on Pakistan. Beyond transportation, international trade influences emissions through production via various channels, such as scale, technique, and composition effects. Although some of these channels have the potential to reduce emissions, the overall effect has often resulted in a net increase. Using firm-level data from Punjab, we investigate the impact of two significant trade policy changes on emissions from production in Pakistan’s textile sector: the termination of the Multi-fibre Arrangement (MFA) in 2005 and the Pakistan-China Free Trade Agreement (FTA) in 2006. Emission levels and intensity were higher in the post-2005 period, particularly for the spinning sector. However, emission levels and intensity were lower for exporters to destinations other than China during the same period. Notably, emission levels and intensity peaked in 2005 compared to 2000 and 2010. While Pakistan’s reliance on fossil fuels has been reduced due to hydroelectric power generation, the country still faces electricity shortages. Payments to power plants and petroleum imports to fuel them have strained government budgets and foreign exchange reserves. Renewable energy sources, such as solar power, offer significant potential to reduce the environmental footprint of Pakistan’s exports. In an upcoming randomized controlled trial (RCT), we aim to explore the role of information provision in incentivizing small and medium firms in the textile and food & beverage processing sectors to adopt solar energy.

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Introduction

International trade plays a pivotal role in the global economy, but its environmental impact is increasingly being scrutinized. According to the World Trade Organization (WTO), international trade, which encompasses the production and transportation of manufactured goods, is responsible for 20-30% of global greenhouse gas (GHG) emissions (WTO, 2021). This significant contribution highlights the critical intersection between economic globalization and environmental sustainability.

Certain industrial sectors stand out as major contributors to greenhouse gas emissions. The most emissions-intensive industries encompass energy production, basic metals manufacturing, coal and petroleum products, computer and electrical equipment production, chemical manufacturing, and pharmaceuticals. The complexity of global value chains has worsened transportation-related emissions. As companies source intermediate inputs from increasingly diverse and distant locations, the carbon footprint of international trade grows.

A meta-analysis by Afesorgbor and Demena (2021) estimated that the trade-openness-emissions elasticity ranges from 0.02 to 0.06, with a more pronounced impact in developed economies. Research covering the years 1991 to 2014 indicated that trade openness incrementally increased CO₂ emissions across nearly 49 studied countries (Sun et al., 2019). Regional variations are particularly noteworthy: the Middle East and Africa exhibited the highest trade-emission elasticities, Southeast Asian countries demonstrated significant emissions correlations, and Europe uniquely experienced a reduction in pollution levels. Additionally, export diversification has been associated with higher CO₂ emissions (Can et al., 2020).

Researchers have identified three primary channels through which trade influences environmental emissions, as outlined by Barrows and Ollivier (2018). The scale effect refers to the increase in emissions resulting from heightened production to meet foreign demand. As international markets expand, manufacturers ramp up production, consequently raising their overall greenhouse gas output. The technological effect presents a potential pathway to emissions reduction. International trade can facilitate the spread of cleaner technologies, enabling firms to lower their emissions per unit of production. Firms that specialize in core competencies tend to exhibit lower emissions intensity. The composition effect introduces a more nuanced dynamic, where changes in firms' product mix can either increase or decrease emissions intensity. These mechanisms highlight the complexity of understanding trade's environmental impact.

Developing countries present a particularly complex emissions narrative, and China serves as a compelling case study. During its World Trade Organization (WTO) accession, Chinese exporters achieved remarkable progress in reducing

emissions intensity. Rodrigue et al. (2022) found that exporting lowered SO₂ intensity by over one-third, primarily through strategic energy sourcing, refined product scope, and modernized capital infrastructure. Pei et al. (2020) noted that the export intensity of Chinese firms is linked to lower SO₂ emissions intensity, although Lin & He (2022) reported mixed results.

India provides another illuminating example. Increased exports were correlated with decreased emissions intensity, driven more by product mix and pricing strategies than by technological improvements (Barrows, 2015, Ch. 1). Barrows and Ollivier (2021) noted that foreign demand heightened the emissions growth rate of Indian exporters due to the scale effect, although technological improvements partially mitigated this impact. However, policy changes such as the termination of the Multi-Fibre Agreement exposed the fragility of these emissions reductions (Barrows, 2015, Ch. 2).

Institutional frameworks significantly influence emissions variations across countries (Shapiro, 2023). Strong institutional mechanisms can favor clean industries, potentially redirect "dirty" industries to regions with more lenient environmental regulations, and influence trade policies that might inadvertently subsidize carbon emissions through the import of "dirty" inputs at lower tariffs (Shapiro, 2021).

The European Union is leading the way with aggressive regulatory mechanisms to address emissions. The Carbon Border Adjustment Mechanism (CBAM) establishes a transitional period from 2023 to 2026, during which importers must report the greenhouse gas content of their goods. Starting in 2026, purchases of mandatory certificates will be required for goods with embedded emissions, affecting industries such as cement, iron, steel, aluminum, fertilizers, electricity, and hydrogen. According to a report by Baker McKenzie (2024), the Corporate Sustainability Due Diligence Directive (CS3D) requires large companies to implement comprehensive due diligence policies, ensuring they identify and mitigate environmental and social risks throughout their operations and value chains.

These emerging regulations have profound implications for Pakistan if they are ultimately (as expected) imposed on textiles. As the world's seventh-largest textile exporter, comprising 60% of Pakistan's total exports and 46% of its manufacturing output, the country would encounter significant challenges in adapting to new international environmental standards.

While trade provides opportunities for technological innovation and economic growth, it also presents significant environmental challenges. Collaborative, nuanced approaches that balance economic development with environmental sustainability will be essential in navigating this complex landscape.

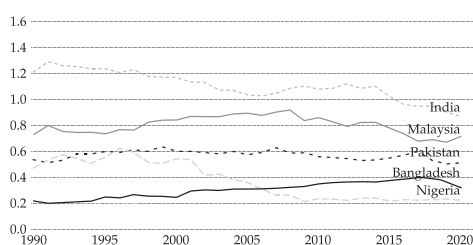
Empirical Analysis of the Trends in the Emissions of Textile Manufacturers in Punjab

Emissions are a function of the type and quantity of fuel firms use (Barrows & Ollivier, 2021). Therefore, the energy efficiency of production is a primary determinant of CO₂ emissions. NEPRA (2023) documents that over 60 percent of Pakistan's electricity comes from non-renewable thermal sources. However, Pakistan's CO₂ emissions per US\$ of GDP are roughly in the middle of the pack when compared to countries such as Bangladesh, India, Malaysia, and Nigeria (Figure 1). This is likely due to Pakistan's reliance on hydroelectric power, which has reduced its dependence on fossil fuels (Figures 2-4).

Two significant events impacting textile sector exports occurred around 2005: the termination of the Multi-fibre Arrangement on January 1, 2005, and the implementation of the Pakistan-China Free-Trade Agreement in 2006.

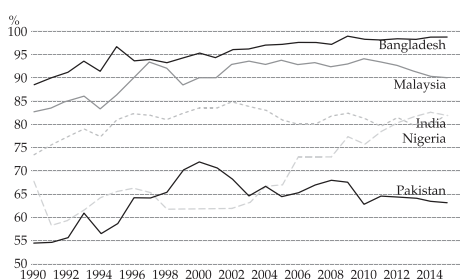
Adopted in 1974, the MFA imposed quotas on the amount of textiles and clothing that developing nations could export to developed countries, aiming to protect domestic industries in those countries. When the MFA agreement ended in 2005, the USA and Europe lifted their quota restrictions on textile and apparel imports from developing nations. Removing quotas was expected to alter trade patterns, providing Pakistan greater access to major markets like the US and EU. However, the benefits of lifting the MFA restrictions in Pakistan were somewhat diminished by various factors, including intense competition from other nations, particularly China. Consequently, Pakistan's market share in the US and EU fell (Whalley, 2006).

Figure 1: CO₂ emissions (kg per 2015 US\$ of GDP)



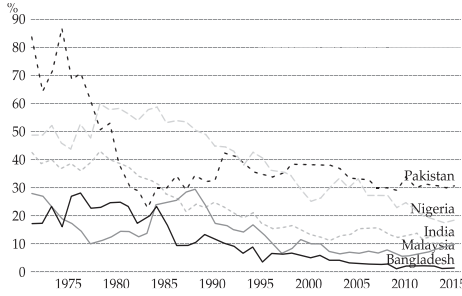
<https://data.worldbank.org/indicator/EN.ATM.CO2E.KD.GD?end=2020&locations=PK-IN-NG-BD-MY&start=1990&view=chart>

Figure 2: Electricity production from oil, gas and coal sources (% of total)



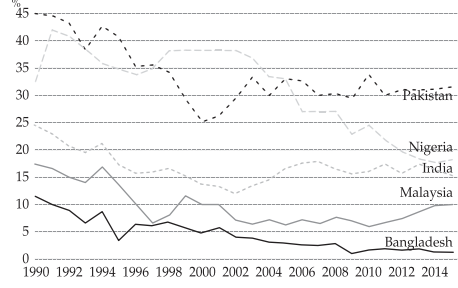
<https://data.worldbank.org/indicator/EG.ELC.FOSL.ZS?end=2015&locations=PK-IN-NG-BD-MY&start=1990&view=chart>

Figure 3: Electricity production from hydroelectric sources (% of total)



<https://data.worldbank.org/indicator/EG.ELC.HYR.O.ZS?locations=PK-IN-NG-BD-MY>

Figure 4: Renewable electricity output (% of total electricity output)



<https://data.worldbank.org/indicator/EG.ELC.RNE.W.ZS?end=2015&locations=PK-IN-NG-BD-MY&start=1990&view=chart>

At about the same time, Pakistan and China entered into a Free Trade Agreement (FTA), where both countries lowered their tariff rates. While the trade balance favored China, Pakistan's exports to China still grew by 13.6% per year between 2003-2018 (World Bank, 2020). Although tariffs fell across all segments, China's concessions to Pakistan were more significant in low-value-added sectors such as spinning and less generous in higher-value-added clothing and garments. Consequently, only the spinning segment experienced a substantial increase in exports to China.

Therefore, Pakistan's textile industry experienced two major external demand shocks in 2005-06, with contrasting outcomes. We empirically analyze the effects of these changes on the emissions of textile manufacturers, considering the timing of these changes and the firms' export destinations. We use data on the textile sector from the CMI for Punjab; details can be found in Jamil et al. (2022).

We consider the overall net effect of these two important agreements on firm-level emissions over time in equation 1a:

$$Y_{ft} = \alpha_0 + \alpha_t + \alpha_s + \alpha_{st} + \gamma_1 Post\_2005 + \theta C_{ft} + \varepsilon_{ft} \quad (1a)$$

where Y_{ft} is log emissions or emissions per unit (i.e. emissions intensity) of firm f at time t , respectively, and the coefficient on $Post\_2005$ measures the ex-post changes following the trade policy changes due to the end of the MFA and the beginning of the Pak-China FTA period. α_t are year-fixed effects; α_s are segment-fixed effects, and α_{st} are segment-year fixed effects. C are controls for firm f at time t , which include firm average productivity, quality, and number of products produced, firm inputs, and dummies for missing data by year. We find that

emissions and emissions intensity increased following the end of the MFA and Pakistan-China Free-Trade Agreement, driven by the spinning sector (Table 1).

Table 1: Total Emissions and Emissions Intensity (Emissions per unit) by Sector, Post-2005

	Industry	Spinning	Clothing	Finishing	Interior
Total emissions					
Post 2005	0.768*** (0.127)	1.388*** (0.225)	0.147 (0.221)	0.295 (0.243)	0.666 (0.425)
Emissions per unit					
Post 2005	1.789*** (0.189)	3.108*** (0.266)	0.372 (0.303)	-0.207 (0.379)	0.666 (0.846)
N	1428	715	352	209	132

Controls include firm average productivity, quality, and number of products produced, firm inputs and segment fixed effects.

Next, we consider how the trends in emissions following the end of the MFA and the beginning of the FTA period differ by export destination, where we separate firms exporting to China from firms exporting to other destinations in equation 1b:

$$Y_{ft} = \alpha_0 + \alpha_t + \alpha_s + \alpha_{st} + \gamma_1 Post\_2005 + \gamma_2 Post\_2005 * Exporter\_China + \gamma_3 Post\_2005 * Exporter\_Other\_Dest + \gamma_4 Exporter\_China + \gamma_5 Exporter\_Other\_Dest + \theta C_{ft} + \varepsilon_{ft} \quad (1b)$$

Exporters to China had higher emission intensity, but the trend did not accelerate post-FTA (Table 2). However, exporters to other destinations saw decreased emissions and emissions intensity in the post-MFA period.

Table 2: Emissions and Emissions Intensity by Export Destination, Post-2005

	Emissions	Emissions Per Unit
Post 2005	0.811*** (0.134)	1.914*** (0.197)
China* Post2005	0.058 (0.193)	-0.412 (0.400)
Other destinations * Post 2005	-0.248* (0.124)	-0.465* (0.218)
China	0.182 (0.155)	0.652* (0.360)
Other Destinations	0.047 (0.102)	0.121 (0.193)

N=1,428

Controls include firm average productivity, quality, and number of products produced, firm inputs and segment fixed effects.

We can explore the trends in greater detail by separately considering the effects in 2005 and 2010 compared to the base year, 2000. In this context, we replace the post-2005 indicator with dummy variables for 2005 and 2010. The results presented in Table 3 tell a similar story to that in Table 1; however, when disaggregated by year, there was a notable increase in emissions intensity in 2005 (compared to 2000) that did not occur in sectors other than spinning in 2010. Emissions and emissions intensity were higher in both 2005 and 2010 compared to the base year, 2000; however, neither reached the levels seen in 2010 as they did in 2005 (Tables 3-4). The decrease in emissions intensity for non-China exporters overall (as shown in Table 2) was, in fact, consistent throughout the post-MFA period, with negative and significant coefficients on the interaction terms of exporters to other destinations for both 2005 and 2010 (Table 4).

Table 3: Total Emissions and Emissions Intensity by Sector, 2005 and 2010

	Industry	Spinning	Clothing	Finishing	Interior
Total Emissions					
Year 2005	0.846*** (0.129)	1.451*** (0.226)	0.199 (0.227)	0.387 (0.272)	1.010* (0.431)
Year 2010	0.615*** (0.136)	1.213*** (0.242)	0.080 (0.248)	0.259 (0.252)	0.174 (0.440)
Emissions per unit					
Year 2005	1.969*** (0.188)	2.965*** (0.262)	0.930** (0.301)	0.876** (0.434)	1.666* (0.793)
Year 2010	1.437*** (0.203)	3.501*** (0.274)	-0.361 (0.336)	-0.622 (0.369)	-0.762 (0.778)
N	1428	715	352	209	132

Controls include firm average productivity, quality, and number of products produced, firm inputs and segment fixed effects.

Table 4: Emissions and Emission Intensity by Export Destination, 2005 and 2010

	Emissions	Emissions Per Unit
Year 2005	0.898*** (0.139)	2.059*** (0.198)
Year 2010	0.639*** (0.143)	1.564*** (0.214)
China*Year 2005	0.158 (0.268)	0.057 (0.456)
Other Destinations*Year 2005	-0.304* (0.144)	-0.448* (0.240)
China* Year 2010	0.046 (0.207)	-0.562 (0.415)
Other Destinations * Year 2010	-0.200 (0.147)	-0.500* (0.242)

	Emissions	Emissions Per Unit
China	0.186 (0.157)	0.655* (0.362)
Other Destinations	0.046 (0.102)	0.116 (0.194)

N=1428

Controls include firm average productivity, quality, and number of products produced, firm inputs and segment fixed effects.

Promoting investment in solar energy across firms in Pakistan: the role of information provision

Pakistan's ongoing electricity shortages and dependence on fossil fuels present major challenges. Xin et al. (2022) estimate an increasing energy gap of 5,000 to 8,000 MW for the country. The financial burden on government budgets and foreign exchange reserves due to payments to power plants and oil imports highlights the urgent need for sustainable solutions. Instead of depending on fossil fuels to close this gap, Pakistan has a valuable opportunity to shift toward renewable energy production.

A transition to renewable energy would help Pakistan not only meet its growing energy demand and reduce carbon emissions but also mitigate the high cost of grid electricity, which significantly constrains the competitiveness of local firms (Bacon, 2019). While some exporting firms, especially in the innovation-driven, export-oriented Sialkot region (known for soccer balls and surgical instruments), have started adopting solar energy to comply with global environmental standards set by their branded customers, most small to medium enterprises lag behind.

A brief phone survey conducted in 2023 of about 500 companies in the targeted sectors revealed that only 16 percent had installed solar power systems. Among those without solar, more than half had considered or were actively considering it. However, cost concerns posed a significant barrier for those contemplating solar. For firms not considering solar, reasons included high installation costs, satisfaction with grid electricity, or low electricity demand.

Despite the significant depreciation of the PKR, local solar installers estimate that the payback period for solar energy has dropped to about 1.5 to 2 years as of August 2024, partly due to the declining cost of imported solar cells. However, only a small percentage of firms, especially small and medium-sized businesses, have embraced solar energy. This gap may stem from insufficient information or biased perceptions among business owners, causing them to underestimate the advantages and overestimate the costs of transitioning to solar power.

Several factors contribute to this situation. Fluctuating panel prices, currency depreciation, import controls, and increased government taxes on panels, inverters,

and cables have affected the cost and availability of solar energy systems. Additionally, a common misconception is that solar energy systems require a substantial upfront investment in batteries or are incompatible with other energy sources, such as generators and grid electricity. In reality, batteries are only necessary if one wishes to entirely replace electricity from the grid. Supplementing one's grid electricity usage with solar energy is significantly more affordable, and electricity from solar panels can be integrated with the grid and generators.

Chaudhry and other co-authors plan to collect primary data on solar energy investment beliefs and intentions from a sample of 400 small and medium manufacturing enterprise owners in the textile and food/beverage processing sectors of Punjab. Through our survey measures, we will assess respondents' beliefs about future electricity costs, the benefits of solar energy sources, the perceived level of solar energy uptake in the community, the perceived prerequisites, maintenance costs, the reliability and life expectancy of the panels, and the ease or difficulty of integrating solar energy into their current energy mix. We will survey firms about their intentions to invest in solar energy in the short- and long-term and identify perceived hindrances such as the integration of solar with other energy sources, financing, and physical requirements. Additionally, the survey will collect data on control variables such as risk tolerance and time preferences.

The second part of the survey features an embedded randomized information experiment. Respondents watch videos of a peer firm discussing the benefits of investing in solar energy and various framings of affordable financing. The primary outcomes measured post-treatment will be the intention to invest in solar and interest in contacting a solar provider. Secondary outcomes will include the beliefs that influence the primary outcomes, such as attitudes toward solar and perceived behavioral control.

According to our 2023 survey, 85% of firms have received information about solar energy through "word-of-mouth" or other firms. Therefore, we believe that our video treatment has the potential to influence firms to consider adopting solar energy, as suggested by our phone survey. Our study aims to address the following questions:

- Can information be an effective means for policymakers to promote manufacturers' adoption of solar energy in a developing country?
- Are there information gaps regarding the costs and benefits of solar? If so, how substantial are these gaps?
- Can these gaps be bridged through information from peer firms?
- Are firms constrained by behavioral control problems, such as trialability and ease (or difficulty) of finance, installation, integration, and maintenance?

The study contributes to the literature on informational experiments that influence economic expectations and decision-making, particularly in the context of renewable energy adoption by firms in developing countries. The study also has policy implications for promoting green and inclusive growth, reducing carbon emissions, and enhancing energy security in Pakistan and similar settings.

Conclusions

Using firm-level data for Punjab, we examined the impact of two significant trade policy changes on emissions from Pakistan's textile sector: the termination of the Multi-fibre Arrangement (MFA) in 2005 and the Pakistan-China Free Trade Agreement (FTA) in 2006. Emission levels and emission intensity were higher in the post-2005 period, especially for the spinning sector. However, emission levels and intensity were lower for exporters to destinations other than China in the same period. Emission levels and emission intensity peaked in 2005 compared to 2000 and 2010.

A field experiment with an embedded informational intervention will be conducted in late 2024 through early 2025. This study aims to understand the constraints faced by small and medium firms in adopting solar energy. Our exploratory study will not only help identify and measure the relative role of structural and informational barriers preventing business owners from investing in solar energy but also provide a first critical step in assessing the impact of information provision on intended solar energy purchasing behavior. The study also has policy implications for promoting green and inclusive growth, reducing carbon emissions, and enhancing energy security in Pakistan.

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5

Product Space: Exploring potential for higher exports in Pakistan

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Abstract

Pakistan has long struggled with a persistent balance of payments deficit, primarily due to merchandise exports being significantly lower than imports. This issue is exacerbated by the country's inability to move up the quality ladder leaving its exports concentrated in low value-added products exacerbating the balance of payment deficit problem. Recognizing the critical need to expand and diversify its export base, this study utilizes the product space network and connectedness framework from the Atlas of Economic Complexity (AEC) to identify potential high value-added products for export growth. The analysis suggests adding products like coke from coal (HS 2704), railway freight cars (HS 8606), Malt (HS 1107), chemical wood pulp (HS 4703), unwrought nickel (HS 7502) to Pakistan's export basket. Expanding exports of existing products such as original sculptures (HS 9703), fishing rods, decoy birds (HS 9507), footwear (HS 6404), stranded wire, cables (HS 7413)' is also recommended. We also estimated the potential gain in the export revenues if Pakistan starts exporting a subset of the products identified. Our estimates indicate that exporting new primary connections could increase merchandise export revenue by 5.54%, while expanding high value-added products could boost revenues by nearly 27.7 % to US\$ 37 billion. Policymakers should focus on these products for an export-oriented industrial strategy. Trade officers and negotiators should link potential foreign buyers with Pakistani producers to capitalize on these opportunities. Prioritizing these products in trade agreements and tariff discussions can also support export growth, helping to address Pakistan's balance of payments deficit and foster sustainable economic development.

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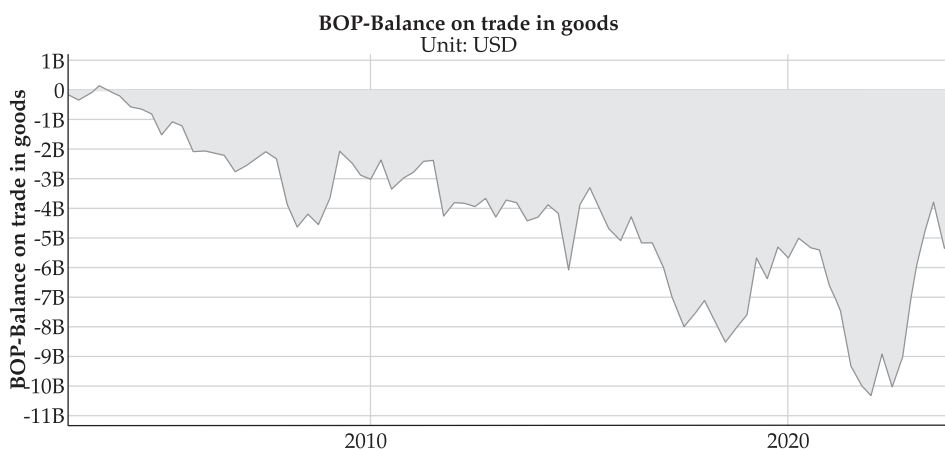
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Introduction

Pakistan ranks as the 41st largest economy globally, with a GDP of US\$ 374.6 billion and a GDP per capita of only US\$ 1,471 in 2022 (International Monetary Fund, 2023). In comparison, other developing countries such as India, Indonesia, Malaysia, and Bangladesh have achieved significantly higher growth over time. This disparity raises a critical question: why has Pakistan's GDP not grown consistently at a faster pace? A key obstacle to economic growth has been Pakistan's persistent balance of payment (BOP) deficit (see Figure 1). The BOP deficit on trade in goods surged from US\$ 126 million in 2002 to US\$ 10.1 billion in 2022. Pakistan's merchandise exports have remained substantially lower than its imports, with exports primarily concentrated in low-value added-products like unprocessed textiles and basic agricultural products. The absence of an export-led trade and industrial policy is a significant barrier. It is imperative for Pakistan to expand and diversify its merchandise exports to overcome the unsustainable BOP deficit problem.

Figure 1: BOP Deficit on Merchandise Trade in Pakistan. 2002 - 2023



Source: State Bank of Pakistan, Easy Data Portal - 2024

The economic literature extensively highlights the positive impact of export growth on GDP (Krueger 1985, Lal 1992, Awokuse 2005, Shirazi & Manap 2005, Koh & Mah 2013, Dreger & Herzer 2012) and productivity (Wagner 2005, Chaudhry & Haseeb 2014, Fatemah & Qayyum 2018) in developing, including Pakistan. However, Pakistan has struggled with limited export expansion and low participation in global value chains, which are identified as critical challenges (Siddique 2018). Despite these insights, a significant gap exists in the literature regarding the identification of specific products that Pakistan could diversify into. To address this gap, we employ product space and economic complexity approach to identify products that can be added to Pakistan's export basket. These products

are chosen for their higher value addition while being within Pakistan's productive capabilities. This approach aims to support policymakers in designing effective trade strategies to enhance exports and integrate Pakistani firms into global value chains.

The rest of the paper is organized as follows. The next section highlights the economic complexity measures and their applications in the economic literature. Section 3 narrates the explanation of variables and data sources. Section 4 shows the export structure and composition of Pakistan. Section 5 sheds light on the analysis and identifies the potential products that can become part of Pakistan's export basket. Section 6 concludes the study and presents relevant policy recommendations.

Applications of the Economic Complexity and Relatedness

Hidalgo and Hausmann (2009) introduced the economic complexity and product space methodology to evaluate a country's productive capacity. The metrics reflect the sophistication of a country's export and are instrumental in formulating industrial policies (Mazzucato, 2011 and Rodrik, 2019). Hidalgo (2021) highlighted the adoption of economic complexity methods by policymakers in regions such as Europe, China, Mexico, and Canada. For example, Ferreira-Coimbra and Vaillant (2009) applied the product space framework to analyze Uruguay's specialization patterns, while Erkan and Yildirimci (2015) found that Turkey's low proportion of high-tech exports indicated a low economic complexity index and reduced export competitiveness. Similarly, Lyubimov et al. (2017) assessed Russia's export diversification potential and provided policy recommendations for further export development. Coskun et al. (2018) linked production structures to per capita income potential using economic complexity tools, concluding that Turkey's specialization in less sophisticated products limits its growth prospects. Singh et al. (2018) explored India's product space to identify potential export diversification opportunities, while Zaldívar et al. (2019) used the methodology to evaluate diversification potential in Mexico's Special Economic Zones. González et al. (2019) identified strategic sectors in Paraguay that could enhance productive capabilities and drive development. These frameworks provide valuable insights into a country's capacity to diversify exports and move toward higher-value-added products and are essential tools for policymakers designing strategies for sustainable economic growth.

The exploration of economic complexity at the subnational level reveals its critical role in shaping local production, global connectivity, competitiveness and sustainable development. Wang and Turkina (2019) demonstrated that the product space network of a subnational region can differ significantly from the national-level network, as seen in their analysis of Quebec compared to Canada. Similarly, Bishop and Mateos-Garcia (2019) analyzed the relationship between economic complexity and regional economic development in the UK, emphasizing the importance of novel data sources for understanding how complexity influences regional growth. Termeer (2019) applied economic complexity tools to suggest pathways

for Bulgaria's economic advancement, while Mealy and Coyle (2022) examined industrial diversity and future growth prospects across UK regions. Their study identified the 'related' industries into which low-complexity, low-wage areas could diversify, offering insights for industrial policy design.

Economic complexity methods are widely used to analyze economic structures in terms of productive capacity, growth and technology diffusion. The Economic Complexity Index (ECI) has been shown to predict long-term economic growth in numerous studies using both international and subnational data (Cristelli et al., 2015, Chavez et al., 2017, and Domini, 2019). Hausmann et al. (2014) noted that only a few economies are capable of producing and exporting highly complex products, as most emerging and developing economies lack sufficient production capabilities. Britto et al. (2016) employed the product space methodology to examine the link between economic complexity and development, using Brazil and South Korea as case studies. Balland and Rigby (2017) used bimodal network models to explore the relationship between spatial knowledge diffusion and complexity, finding that U.S. cities with the most intricate technological structures do not necessarily exhibit the highest patenting rates. Dieppe (2021) incorporated ECI as a driver of productivity growth, echoing earlier findings by Goodfriend and McDermott (1998), Jarreau and Poncet (2012), and Diao et al. (2019). Higher economic complexity indicates shows greater production capabilities, which are generally associated with more diversified exports, higher productivity, enhanced growth prospects and increased technology diffusion. Fritz and Manduca (2021) analyzed the U.S. metropolitan areas from 2007 to 2015, concluding that regions with higher complexity tend to have higher per capita income, but are more vulnerable to financial crises.

Economic complexity has been linked to various economic factors, including income inequality and the gender wage gap. Boschma et al. (2013) analyzed the regional industrial diversification in Spain using a proximity-based approach, concluding that proximity to regional industrial structures is more influential in the emergence of new industries than proximity to national structures. Chavez et al. (2017) applied the Method of Reflections proposed by Hausmann and Hidalgo (2009) to examine economic complexity and regional growth in Mexico, finding significant disparities in regional complexity and growth performance, which carry important implications for industrial policy.

Reynolds et al. (2018) used economic complexity analysis to study Australia's sub-national economy, focusing on nine regions and 506 exported goods and services. Their findings revealed that even minor disparities in industrial capability and knowledge significantly influence relative complexity. Lee and Vu (2019), using the cross-country data, found that economies producing more complex products tend to exhibit lower income inequality, especially in countries with high human capital. However, within countries, higher economic complexity was associated with increased income inequality. Similarly, Chu and Hoang (2020) identified a

positive relationship between economic complexity and income inequality but noted that factors like trade openness, education and government spending could mitigate this effect, enabling economic complexity to reduce inequality under favorable conditions. At the subnational level, evidence suggests that higher economic complexity often widens income disparities. Sbardella et al. (2017) and Bandeira Morais et al. (2018) demonstrated this trend in regional contexts. In contrast, Barza et al. (2020) showed that industries with higher complexity in Brazil, tend to have lower gender wage gaps. Beyond income inequality, economic complexity also positively influences human development (Ferraz, 2018) and health indicators (Vu, 2020).

Recent literature has increasingly linked economic complexity to environmental sustainability, particularly in terms of greenhouse gas emissions and the creation of green jobs. Using the environmental Kuznets curve hypothesis, Can and Gozgor (2017) found that higher economic complexity in France is associated with significantly lower CO₂ emissions. Similarly, studies by Chu (2020), Swart and Brinkmann (2020), Doğan et al. (2019), and Neagu and Teodoru (2019) revealed an inverse U-shaped relationship between economic complexity and greenhouse gas emissions. Romero and Gramkow (2021) showed lagged Economic Complexity Index (ECI) values are negatively correlated with emissions intensity. Swart and Brinkmann (2020) used economic complexity metrics to analyze sustainable development in Brazil, while Dordmon et al. (2020) investigated how a state's economic complexity affects the environmental friendliness of its occupational landscape in Brazil.

Economic complexity methods have become popular tools in innovation studies (Hidalgo, 2021), particularly for analyzing how products are interconnected within the product space and how this connectedness drives patterns of specialization over time. Relatedness, a key concept, measures the probability that a product or sector correlated with those currently produced or exported will enter an economy's product space in the future. This principle suggests that firms absorb new knowledge more effectively when it closely aligns with existing knowledge (Hidalgo, 2021). Economic literature extensively uses relatedness metrics to predict specialization patterns. Boschma et al. (2015), for instance, employed economic complexity methods to study technological relatedness and its impact on technological change across 366 U.S. cities from 1981 to 2010. Their findings revealed that a 10% increase in relatedness with existing technologies increased the likelihood of a new technology entering a city by 30% .

Jara-Figueroa et al. (2018) explored the impact of industry-specific, occupation-specific and location-specific relatedness on the survival of new entrants in the market. Their findings revealed that firms with industry and occupation-specific relatedness had a significantly higher likelihood of survival. In the context of international trade, Bahar et al. (2019) used proximity measures among products to

show that economies are more likely to diversify into upstream sectors, such as transitioning from final goods production to intermediate inputs, rather than from raw materials to intermediate inputs. Jun et al. (2019) analyzed bilateral trade data and concluded that relatedness among products, exporters (origins) and importers (destinations) is a strong predictor of future export pattern, particularly for high complexity products. Innocenti and Lazzeretti (2019 and 2019) explored the industrial and employment growth in Italian industries using the industry-relatedness approach. Cicerone et al. (2020) adapted the product-space methodology to study Italian provinces, finding a correlation between economic performance, interconnectedness and centrality of its exports network.

Recent research has explored how relatedness interacts with various factors to explain patterns of economic specialization. Boschma and Capone (2015) found that relatedness has a stronger influence on diversification in coordinated market economies, while liberal market economies are more adept at pioneering development. Cortinovis et al. (2017) showed that mitigating social capital enhanced the effects of relatedness on diversification. Zhu et al. (2017) observed that regions with high levels of FDI, R&D, and human capital experience fewer constraints from relatedness, leading to more innovative development paths. Pinheiro et al. (2018) noted that regions with higher education levels attract more unrelated entrants. Huang and Zhu (2020) found that in China, regions with higher pollution experiences entries of more unrelated activities.

Hidalgo and Hausmann (2009) introduced ECI, product space and connectedness concepts to measure a country's productive capacity. These tools are used to explore optimal industrial diversification paths and evaluate industrial policies (Hidalgo 2021). To improve its ECI, an economy can focus on expanding into industries or products that are related to its current knowledge base. Relatedness indicates the ease of expanding an existing industry or entering a new one. Countries can more easily produce and export products closer to their current capabilities (Hausmann et al., 2014, Balland et al., 2018, Marrocu, 2020). As new products and industries are identified based on ECI and relatedness measures, and successfully developed, the country's ECI increases over time. However, policy makers should be cautious when selecting new products. Alshamsi et al. (2018) and Waniek et al. (2020) argue that choosing highly related products or industries may not be optimal for maximizing diversification. Instead, policymakers could target relatively unrelated but connected activities that presents opportunities at specific development stages. Economic diversification policies should be approached as a portfolio allocation problem rather than simply selecting products with high relatedness.

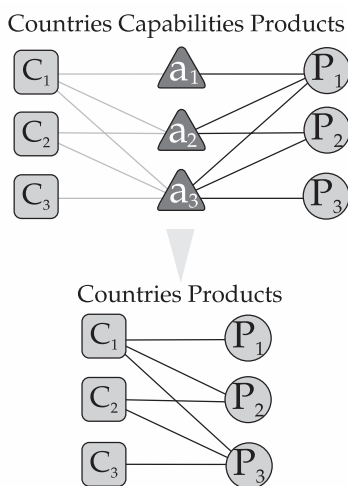
Product space, economic complexity and connectedness have significant implications for policies related to industrial diversification, environmental sustainability, income and gender inequality, and economic growth. Despite their

importance in economic literature, these methods remain underexplored in Pakistan. Our paper addresses this literature gap by analyzing the product space network and economic complexity to identify potential products for export expansion and diversification in Pakistan. The paper aims to initiate a discussion on strategies for policymakers to formulate a favorable and a realistic trade related industrial policy for Pakistan. It identifies potential products that can become part of Pakistan's product space and estimates the potential gain in export revenues, which would help mitigate the balance of payments problem.

Explanation of variables and data sources

Economic complexity captures the 'diversity' and 'sophistication' of a country's industrial presence (Hidalgo and Hausmann, 2009). It reflects the geography of economic activities and the extent of an economy's capabilities. Intuitively stating, if country 1 has ability 1, 2 and 3, then it can export products 1, 2 and 3; country 2, with abilities 2 and 3, exports products 2 and 3; while country 3, with only ability 3, can only export product 3. This tripartite network is transformed into a bipartite network as shown in Figure 2.

Figure 2: The relationship between productive capabilities and production in an economy



Source: Hidalgo and Hausmann (2009)

The methodology employs data on a country's exports and organizes it into a matrix of a bipartite network whereby, the rows represent country c , and columns represent the products exported (p). The binary matrix assigns a value of 1 to the exported product if country c has a revealed comparative advantage (RCA) in that product, and a value of 0 otherwise. As the bipartite network is symmetric, Hidalgo

and Hausmann (2009) refer to it as the method of reflections (MOR). If the matrix is stated as M_{cp} , then it can be defined as follows. The variable 'X' represents exports.

$$M_{cp} = 1 \text{ if } R_{cp} \geq 1$$

$$\text{Whereby } R_{cp} = \left(\frac{X_{cp} X}{X_c X_p} \right)$$

$$X_c = \sum_p X_{cp}, X_p = \sum_c X_{cp} \text{ and } X = \sum_{cp} X_{cp}$$

This matrix eventually generates two sequences namely ECI, which reflects complexity of the economy, and Product Complexity Index (PCI), which reflects the complexity or sophistication of the exported products. The initial conditions for generating these sequences are the 'diversity' of each country (M_C), measured by the number of products exported, and the ubiquity of each product (M_P), observed as the number of countries exporting it (Tiennot, 2022).

$$M_C = \sum_P M_{CP}$$

$$M_P = \sum_C M_{CP}$$

For countries c to N , $N \geq 1$, these can be written as follows:

$$M_{C,N} = \frac{1}{M_{C,0}} \sum_P M_{CP} k_{P,N-1}$$

$$M_{P,N} = \frac{1}{M_{P,0}} \sum_C M_{CP} k_{C,N-1}$$

ECI is the solution to the following system of equations; K_C is the complexity of the country whereas K_P is the complexity of the exported product.

$$K_C = \frac{1}{M_C} \sum_P M_{CP} K_P$$

$$K_P = \frac{1}{M_P} \sum_C M_{CP} K_C$$

This is equivalent to diagonalizing the following matrix:

$$\underline{M}_{CC'} = \sum_P \frac{M_{CP} M_{C'P}}{M_C M_P}$$

Economic complexity is a relative measure and thus, the results for both indices are normalized as follows. Here, $\underline{K}_C$ is the average of K_C and $\sigma(K_C)$ is the standard deviation of K_C .

$$ECI = \frac{K_c - \underline{K}_c}{\sigma(K_c)}$$

$$PCI = \frac{K_p - \underline{K}_p}{\sigma(K_p)}$$

According to the observatory of economic complexity (OEC), metrics for measuring the complexity of economies or products are derived from eigenvectors of matrices that connect related countries ($M_{CC'}$) or related products ($M_{PP'}$). The matrix $M_{CC'}$ represents the similarity of countries based on their shared RCA. Higher values of $M_{C,N}$ indicate countries with a greater number of RCA connections to other countries, while lower values suggest fewer such connections. Similarly, $M_{P,N}$ ranks products based on their interconnectedness with other products, where lower values represent the most interconnected products. It is important to mention that decline in a country's ECI in a year does not necessarily imply a reduction in its productive structure. Instead, it reflects changes in the similarity of shared RCA between the country c and others in the sample (Tiennor, 2022).

ECI and PCI are the complexity metrics that measure the technological capacity of an economy and the sophistication of its exported products, respectively. Relatedness, or *connectedness*, reflects the “similarity” between an economy and the exported products, helping to identify potential patterns of specialization. For instance, connectedness can reveal whether Pakistan’s export basket aligns with the requirements for producing high-end textiles or automobiles. Connectedness measures are formally calculated using proximity metrics. If $M_{C,P}$ defines the exported products p in country c then proximity metrics between pairs of products ($\phi_{pp'}$) between pairs of countries, $\phi_{CC'}$, forms the ‘product space’ (Hidalgo, 2021).

The relatedness space in the OEC categorizes products into those that are highly related, moderately related, or unrelated to a country's current export basket. The measure of proximity relating a country c with a product p can be estimated as:

$$\omega_{cp} = \frac{\sum_{p'} M_{CP'} \phi_{PP'}}{\sum_{p'} \phi_{PP'}}$$

Connectedness can also be estimated by looking at similar locations:

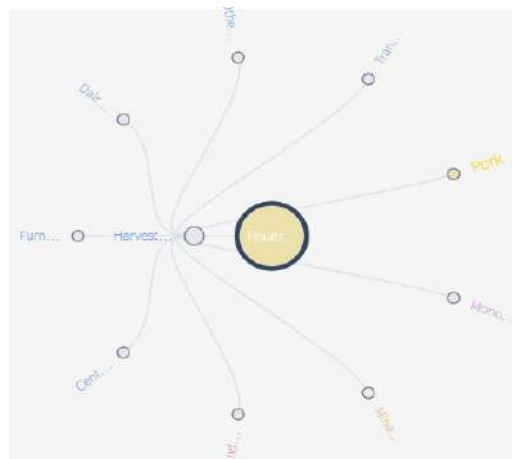
$$\omega_{cp} = \frac{\sum_{p'} M_{CP'} \phi_{CC'}}{\sum_{p'} \phi_{CC'}}$$

Our paper focuses on the product space of an economy, which visualizes the products exported in a given year and depicts the connectedness between them based on similarities in the know-how required for production. The product space networks are characterized by clusters, where related industries, such as garments

or electronics, are clustered together (Hidalgo, 2021). A key feature of the product space is the distinction between a core and periphery, where industries more closely related to each other are located in the core. These insights are derived from the Atlas of Economic Complexity (AEC) database.

Apart from the product space, the AEC also features a ring chart visualization. This tool showcases exports closely associated with a chosen product, either because they are related or commonly co-exported by the same country. These products are linked through their technological resemblance, indicating the use of similar production techniques. For example, if a country exports poultry with $RCA > 1$, related harvesting or threshing machinery is identified as a primary connection. If the country exports the primary connection with an $RCA < 1$, the industrial policy could then focus on expanding exports in this category. However, if the economy is already specialized in exporting primary connections, policies can target secondary connections, such as products related to harvesting or threshing machinery (see Figure 3).

Figure 3: Visualization of a Ring Chart.



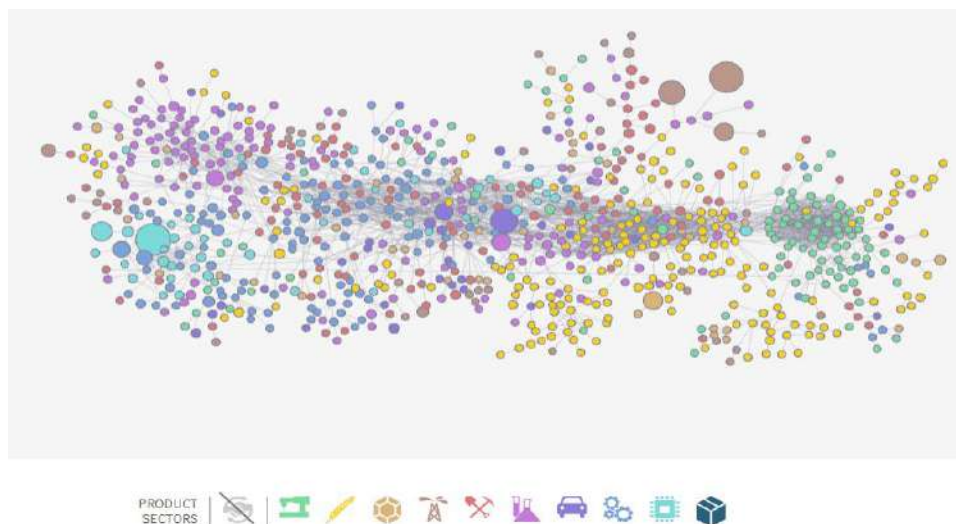
Source: AEC, Harvard Growth Lab 2024

The data for exports in this paper is based on the Harmonized System (HS) 1992 codes at the 4-digit level. We firstly display the product space of Pakistan and use the network to highlight the primary connections with its 2021 export basket, as this is the latest year for which data is available in AEC.

Export structure of Pakistan in 2021

A tree map visually displays the HS 92 4-digit codes exported by an economy. Figure 4 indicates that that in 2021, Pakistan reported exports of US\$ 36.7 billion, with the

Figure 5: Pakistan's Product Space 2021



Source: AEC, Harvard Growth Lab 2024

Table 1: Key to coloured nodes and associated product sectors in the product space

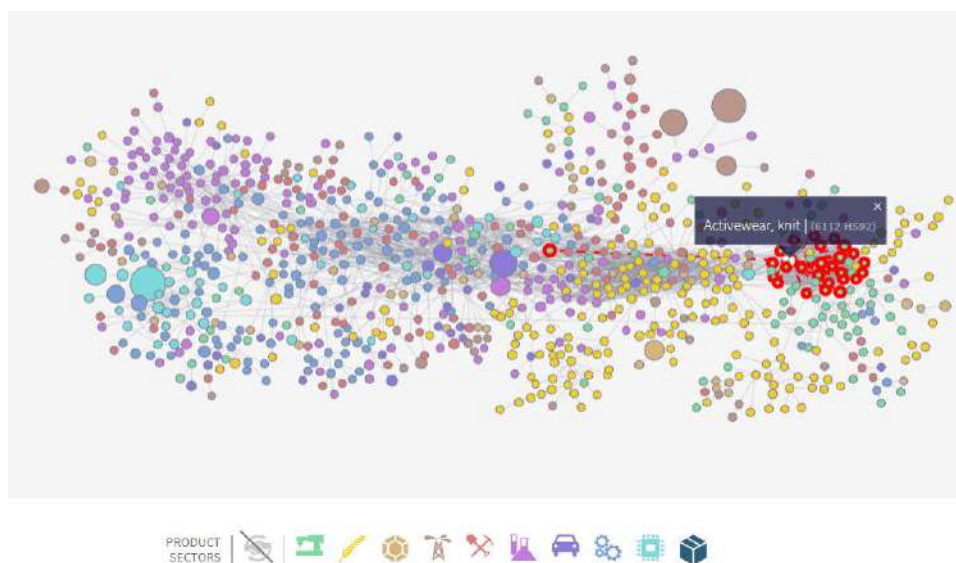
Color	Product Sector
Green	Textiles
Yellow	Agriculture
Gold	Stone
Brown	Minerals
Red	Metals
Light Purple	Chemicals
Dark Purple	Vehicles
Blue	Machinery
Neon	Electronics
Teal	Other sectors

Source: AEC, Harvard Growth Lab 2024

Hovering and clicking on a node highlights the products that are likely to be co-exported. As seen in Figure 6 below, by clicking on HS 92 4-digit code 6112 (activewear, knit), several smaller nodes are highlighted in red. These represent primary connections, which in this case include products such as 6101 (Men's or boys' overcoats, carcoats), 6104 (Women's or girls' suits), 6108 (Women's or girls' slips, petticoats), 6111 (Babies' garments and clothing accessories, knitted or crocheted), 6117 (Other made up clothing accessories, knitted or crocheted), 6202 (Women's or girls' overcoats,carcoats), 6206 (Women's or girls' blouses, shirts and

shirt-blouses), 6302 (Bed linen, table linen, toilet linen and kitchen linen), 6403 (Footwear). Similarly, primary connections can be explored for every exported product in Pakistan. For this analysis, we have considered the primary connections of all the products exported by Pakistan in 2021. These include 795 HS 92 4-digit categories within Pakistan's export basket that have at least one primary connection. The total number of HS 92 4-digit categories across all primary connections amounts to 4,879, while the unique number of HS 92 4-digit categories within these primary connections is 833.

Figure 6: Pakistan's Product Space and Primary Connections 2021



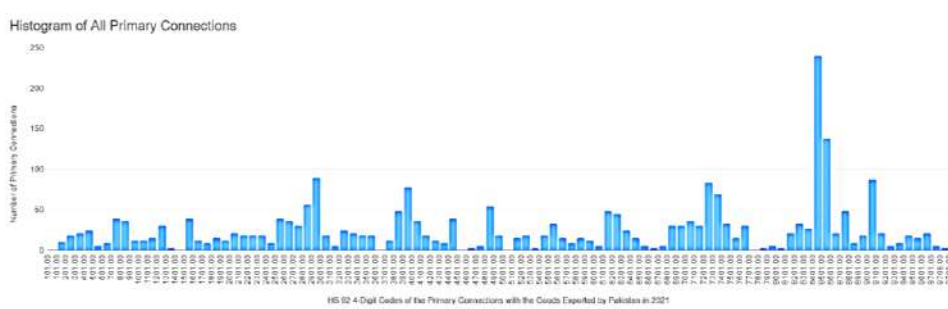
Source: AEC, Harvard Growth Lab 2024

Potential Exports Based on Primary Connections

The main proposition put forward here is that if a product has a primary connection to Pakistan's export basket in 2021, then potentially, based on the technological similarity and absorptive capacity, Pakistan has the capability to increase the export of that product in the near future. Figure 7 shows the histogram of the 833 primary connections using the corresponding HS 92 4-digit product codes. The central proposition here is that if a product has a primary connection to Pakistan's export basket in 2021, then, based on technological similarity and absorptive capacity, Pakistan potentially has the capability to increase exports of that product in the near future. Figure 7 presents a histogram of the 833 primary connections using the corresponding HS 92 4-digit product codes. Products within the ranges of 6200 to 6300, 3850 to 3950, 7200 to 7400, and 8400 to 8700 are most frequently connected to

Pakistan's 2021 export basket, suggesting they could be important inputs. These include products such as 6101 (Men's or boys' overcoats, carcoats), 6104 (Women's or girls' suits), 6108 (Women's or girls' slips, petticoats), 6111 (Babies' garments and clothing accessories, knitted or crocheted), 6117 (Other made up clothing accessories, knitted or crocheted), 6202 (Women's or girls' overcoats, carcoats), 6206 (Women's or girls' blouses, shirts and shirt-blouses), 6302 (Bed linen, table linen, toilet linen and kitchen linen), 6403 (Footwear), 3921 (Other plates, sheets, film, foil and strip, of plastics), 3925 (Builders' ware of plastics, not elsewhere specified or included), 7326 (Other articles of iron or steel), 7325 (Other cast articles of iron or steel), 7616 (Other articles of aluminum), 8466 (Parts and accessories suitable for use solely or principally with the machines of headings 8456 to 8465, including work or tool holders, self-opening dieheads, dividing heads and other special attachments for machine tools), 8428 (Other lifting, handling, loading or unloading machinery), 8716 (Trailers and semi-trailers; other vehicles, not mechanically propelled; and parts thereof), 8708 (Parts and accessories of the motor vehicles of headings 8701 to 8705), 8419 (Machinery, plant or laboratory equipment, whether or not electrically heated (excluding furnaces, ovens and other equipment of heading 8514)), 8406 (Steam turbines and other vapor turbines, and parts thereof), 8416 (Furnace burners for liquid fuel), and 8544 (Insulated(including enameled or anodized) wire), 8409 (Parts suitable for use solely or principally with the engines).

Figure 7: Histogram of Primary Connections of Pakistan's Export Basket in 2021



Source: Authors' calculations

The following Table 2 represents the top 20 products that appear most frequently within the primary connections. It is evident that Pakistan exports products such as 6109, 6204, or 6202, which demonstrate a comparative advantage. However, the top three products listed in the table—7326, 7325 and 8483—are more complex but have lower export levels due to their low RCA. This indicates that Pakistan has the technological capability to enhance exports in these categories, as

these are identified as primary connections. Increasing exports in these areas could significantly increase the overall economic complexity of Pakistan.

Table 2: Products identified as primary connections of Pakistan's 2021 export basket, sorted in descending order of number of times the primary connection occurs

HS 1992 Code	Product	Number of times the connection appears	RCA	PCI
7326	Other articles of iron or steel	48	0.1280	0.9343
7325	Other cast articles of iron or steel	37	0.0832	0.3706
8483	Transmission shafts (including camshafts and crankshafts) and cranks; bearing housings, housed bearings and plain shaft bearings; gears and gearing; ball or roller screws; gear boxes and other speed changers, including torque converters; flywheels and pul	37	0.0290	1.3137
3925	Builders' ware of plastics, not elsewhere specified or included	36	0.0101	0.2176
6109	T-shirts, singlets, tank tops and similar garments, knitted or crocheted	36	7.8900	-1.2803
3921	Other plates, sheets, film, foil and strip, of plastics	34	0.0253	0.5991
4415	Packing cases, boxes, crates, drums and similar packings, of wood; cable-drums, of wood; pallets, box-pallets and other load boards, of wood; pallet collars of wood	34	0.0331	0.4140
6114	Other garments, knitted or crocheted	34	3.5100	-1.3249
6204	Women's or girls' suits, ensembles, suit-type jackets, blazers, dresses, skirts, divided skirts, trousers, bib and brace overalls, breeches and shorts (other than swimwear)	34	9.4600	-1.3247
6810	Articles of cement, of concrete or of artificial stone, whether or not reinforced	34	0.0876	0.4413
6104	Women's or girls' suits, ensembles, suit-type jackets, blazers, dresses, skirts, divided skirts, trousers, bib and brace overalls, breeches and shorts (other than swimwear), knitted or crocheted	33	6.9300	-1.3329
6111	Babies' garments and clothing accessories, knitted or crocheted	33	6.8300	-1.5907
6202	Women's or girls' overcoats, carcoats, capes, cloaks, anoraks (including ski-	33	1.1100	-0.6045

HS 1992 Code	Product	Number of times the connection appears	RCA	PCI
6806	jackets), windbreakers and similar articles(including padded, sleeveless jackets), other than those of heading 6204 Slag wool, rock wool and similar mineral wools; exfoliated vermiculite, expanded clays, foamed slag and similar expanded mineral materials; mixtures and articles of heat-insulating, sound-insulating or sound-absorbing mineral materials, other than those o	33	0.0012	0.7858
7616	Other articles of aluminum	33	0.0710	0.7401
8466	Parts and accessories suitable for use solely or principally with the machines of headings 8456 to 8465, including work or tool holders, self-opening die heads, dividing heads and other special attachments for machine tools; tool holders for any type of to	33	0.0135	1.5134
6207	Men's or boys' singlets and other undershirts, underpants, briefs, nightshirts, pajamas, bathrobes, dressing gowns and similar articles	32	33.5000	-1.4255
8428	Other lifting, handling, loading or unloading machinery (for example, elevators, escalators, conveyors, teleferics)	32	0.0099	1.0399
6102	Women's or girls' overcoats, carcoats, capes, cloaks, anoraks (including ski-jackets), windbreakers and similar articles, knitted or crocheted, other than those of heading 6104	31	7.5400	-1.0303
6208	Women's or girls' singlets and other undershirts, slips, petticoats, briefs, panties, nightdresses, pajamas, negligees, bathrobes, dressing gowns and similar articles	31	11.5000	-1.2983

The primary connections in Figure 7 include products with an RCA equal to zero, greater than zero but less than one, or greater than one. If a primary connection has an RCA of zero, it could be considered a new sub-sector where trade related industrial policy can focus. Conversely, if primary connections have RCA values greater than zero or greater than one, Pakistan can more easily increase its exports in these sub-sectors, as these products are already being produced and exported. In the following sections, we outline potential exports under each scenario. We specifically consider products with a Product Complexity Index (PCI) greater than

the reported ECI value for 2021 in our recommendations. Increasing exports in these products would have a more significant impact on export revenues and technological capabilities in the future.

Scenario 1: The Primary Connections with the goods exported by Pakistan in 2021 which have RCA equal to zero

This category focuses on products within the primary connections that were not part of Pakistan's export basket in 2021 but have technological similarity, making them potential additions to the export basket in the near future. As previously explained, Table 3 lists the top ten products sorted by descending PCI values, with an RCA of zero and a PCI greater than Pakistan's reported value of ECI of -0.49. The complete list of 58 HS 92 4-digit codes for primary connections with an RCA of zero is available in Appendix A. From Table 3, it is evident that products such as 'electrical energy', 'coke etc of coal, lignite or peat, retort carbon', 'manganese', 'railway or tramway freight cars', 'sunflower seeds', and 'malt' could be added to the export basket in the near future. These products are more feasible compared to others like 'Tanks and other armored fighting vehicles' or 'Unwrought nickel', as their PCI values are closer to -0.49.

Table 3: Products identified as primary connections of Pakistan's 2021 export basket with RCA equal to zero. Product Complexity Index is greater than Economic Complexity Index and products are sorted in ascending order of Product Complexity Index

HS92 4-digit Codes	Product Name	PCI	Sector
2716	Electrical energy	-0.4053	Minerals
2704	Coke etc of coal, lignite or peat, retort carbon	-0.3307	Minerals
8111	Manganese and articles thereof, including waste and scrap:	-0.2863	Metals
8606	Railway or tramway freight cars, not self-propelled	-0.0826	Vehicles
1206	Sunflower seeds	-0.0641	Agriculture
1107	Malt, whether or not roasted	-0.0638	Agriculture
4703	Chemical woodpulp, soda or sulfate, other than dissolving grades	-0.0357	Agriculture
4301	Raw furskins (including heads, tails, paws and other pieces or cuttings, suitable for furriers' use), other than raw hides and skins of heading 4101, 4102 or 4103	-0.0046	Agriculture
8710	Tanks and other armored fighting vehicles, motorized, whether or not fitted with weapons, and parts of such vehicles	0.0166	Vehicles
7502	Unwrought nickel	0.0549	Metals

Scenario 2: The Primary Connections with the goods exported by Pakistan in 2021 which have RCA greater than zero and less than one

This category filters products within primary connections of Pakistan's export basket in 2021, with RCA less than 1. As in the case of Scenario 1, we only enlist top 10 products that have PCI values greater than -0.49 in Table 4. The products are sorted in ascending order of PCI. Appendix B shows the complete list of 630 products with an RCA between zero and one.

It is crucial to note that not every product exported by a country with an RCA less than one is considered a primary connection. Primary connections are identified based on technological similarity and proximity to the current export basket. For instance, Pakistan exported 5006 (silk yarn) in 2021 with an RCA less than one, but it is not identified as a primary connection in the AEC database. However, nearby products such as 5105 (wool and fine or coarse animal hair, carded or combed), and 5107 (yarn of combed wool, not put up for retail sale) are identified as primary connections, both of which were also exported by Pakistan in 2021 with an RCA less than one. In formulating industrial policy, sub-sectors within 5105 and 5107 hold more importance compared to those within 5006 because these products are closer in terms of proximity, productive capacity and technological similarity, even if the differences are minor.

Therefore, the primary connections listed in Table 4 are crucial for policy shifts in the near future. These are relatively more complex, higher value-added primary connections that Pakistan already exports but with a low RCA. Increasing exports in this category can lead to higher economic complexity and potentially significantly increase export revenues.

Table 4: Products identified as primary connections of Pakistan's 2021 export basket with RCA between zero and one. Product Complexity Index is greater than Economic Complexity Index and products are sorted in ascending order of Product Complexity Index

HS 1992 Code	Product	RCA	PCI	Sectors
4819	Cartons, boxes, cases, bags and other packing containers, of paper, paperboard, cellulose wadding or webs of cellulose fibers; box files, letter trays and similar articles, of paper or paperboard of a kind used in offices, shops or the like	0.1920	-0.4764	Agriculture
9703	Original sculptures and statuary, in any material	0.0684	-0.4758	Textiles
9507	Fishing rods, fish hooks and other line fishing tackle; fish landing nets, butterfly nets and similar nets; decoy birds (other than those of heading 9208 or 9705) and similar hunting or shooting equipment;	0.1130	-0.4749	Machinery

HS 1992 Code	Product	RCA	PCI	Sectors
	parts and accessories thereof			
8001	Unwrought tin	0.0079	-0.4694	Metals
6404	Footwear with outer soles of rubber, plastics, leather or composition leather and uppers of textile materials	0.0964	-0.4640	Textiles
7413	Stranded wire, cables, plaited bands and the like, including slings and similar articles, of copper, not electrically insulated:	0.0530	-0.4523	Metals
7206	Iron and nonalloy steel in ingots or other primary forms (excluding iron of heading 7203)	0.0296	-0.4488	Metals
1904	Prepared foods obtained by the swelling or roasting of cereals or cereal products (for example, cornflakes); cereals (other than corn (maize)) in grain form or in the form of flakes or other worked grains (except flour, groats and meal)	0.1350	-0.4398	Agriculture
2102	Yeasts (active or inactive); other single-cell microorganisms, dead (but not including vaccines of heading 3002); prepared baking powders	0.0138	-0.4300	Agriculture
4302	Tanned or dressed furskins (including heads, tails, paws and other pieces or cuttings), unassembled, or assembled (without the addition of other materials) other than those of heading 4303	0.0487	-0.4276	Agriculture

Scenario 3: The Primary Connections with the goods exported by Pakistan in 2021 which have RCA greater than one

This category filters the remaining 145 products within the primary connections that are part of Pakistan's export basket in 2021, with a higher comparative advantage. Table 5 lists the top ten primary connections according to the RCA, with a PCI greater than -0.49. Appendix C provides a detailed list of the 145 primary connections with an RCA greater than one. It is evident in Table 5 that the PCI of Pakistan's main exports is relatively low, indicating low value-added exports and lower export revenue. Conversely, the top three products by PCI such as HS 92 4-digit categories labeled as 3907, 8211 and 8203, show low export levels despite having a higher PCI compared to the ECI. Therefore, we recommend that industrial policy should focus on product sectors with relatively lower RCA but higher PCI than the ECI. Examples of such products include 1702, 8203 and 9506 in Table 5.

Table 5: Products identified as primary connections of Pakistan's 2021 export basket with RCA greater than one. Products are sorted in descending order of RCA

HS 1992 Code	Product	RCA	PCI	Sectors
9404	Mattress supports; articles of bedding and similar furnishing (for example, mattresses, quilts, eiderdowns, cushions, pouffes and pillows) fitted with springs or stuffed or internally fitted with any material or of cellular rubber or plastics, whether or not	6.6300	-0.4773	Textiles
4013	Inner tubes, of rubber	5.6100	-0.4614	Chemicals
5509	Yarn (other than sewing thread) of synthetic staple fibers, not put up for retail sale	3.8500	-0.4513	Textiles
5211	Woven fabrics of cotton, containing less than 85 percent by weight of cotton, mixed mainly or solely with man-made fibers, weighing more than 200 g/m ²	31.9000	-0.3974	Textiles
6309	Used clothes and textiles	29.0000	-0.3748	Textiles
6303	Curtains (including drapes) and interior blinds; curtain or bed valances	13.0000	-0.2721	Textiles
1702	Other sugars, including chemically pure lactose, maltose, glucose and fructose, in solid form; sugar syrups not containing added flavoring or coloring matter; artificial honey, whether or not mixed with natural honey; caramel	4.7700	-0.1064	Agriculture
5512	Woven fabrics of synthetic staple fibers, containing 85 percent or more by weight of synthetic staple fibers	13.0000	0.1794	Textiles
9506	Articles and equipment for general physical exercise, gymnastics, athletics, other sports (including table-tennis) or outdoor games, not specified or included elsewhere in this chapter; swimming pools and wading pools; parts and accessories thereof	4.4400	0.4466	Machinery
8203	Files, rasps, pliers (including cutting pliers), pincers, tweezers, metal cutting shears, pipe cutters, bolt cutters, perforating punches and similar hand tools, and base metal parts thereof	4.4400	0.7937	Metals

Export Revenue Estimation

From the analysis of the three scenarios, we identified the new, more complex products that can be added to Pakistan's export basket in the near future, leveraging the productive capabilities present in 2021. Additionally, we identified more complex products that are primary connections and are already exported by Pakistan, albeit

with an RCA less than one. Increasing exports in these categories is crucial as it would not only generate revenue but also enhance the overall economic complexity. Our primary objective was to provide policy makers with a template for export diversification and highlight currently exported goods with maximum potential for growth.

In this section, we estimate the potential impact on export revenue generation if Pakistan begins exporting the 58 primary connections with RCA equal to zero; expand the exports of 630 primary connections with an RCA of zero, expands exports of the 145 products with an RCA >1. We simulate the results as four distinct cases. with the outcomes summarized in Table 6.

- a) Simulation 1 projects the impact on merchandise exports if Pakistan begins exporting the 58 primary connections. In this scenario, the potential export value of for each new product is assumed to equal the average export value of products Pakistan currently exports. The results indicate that expanding into these new categories could increase Pakistan's merchandise exports by more than 5.54% (from US\$ 29.321 billion to US\$ 30.945 billion).
- b) Simulation 2 projects the impact on merchandise exports if Pakistan begins exporting the 58 new products identified in Scenario 1 and doubles the exports of the 630 primary connections with an RCA between 0 and 1. The potential export value of for each new product is assumed to be equal to the average value of products Pakistan currently exports. The results indicate that expanding into these new categories and increasing exports of goods that Pakistan is capable of producing could increase its merchandise exports by almost 22%, from US\$ 29.321 billion to US\$ 35.822 billion.
- c) Simulation 3 projects the impact on merchandise exports if Pakistan begins exporting the 58 new products identified in Scenario 1 and doubles the export of the 630 primary connections with an RCA between 0 and 1. In this scenario, the potential value of exports for each new product is assumed to be twice the average value of products Pakistan currently exports. The results indicate that expanding into these new categories and increasing exports of goods that Pakistan is capable of producing could increase its merchandise exports by almost 27.7%, from US\$ 29.321 billion to US\$ 37.446 billion.

Though these simulations are simple approximations, they show the impact of expanding the country's export base towards more complex products.

Table 6: Potential Growth in Pakistan's Merchandise Exports based on Simulations

Pakistan's Merchandise Exports in 2021 (US\$ Billion)	29.321
Simulation 1: Potential Merchandise Exports after adding 58 primary connections with RCA = 0. We have taken the potential value of exports for each new product equal to the average value of exports for each product Pakistan currently exports.	30.945
Simulation 2: Potential Merchandise Exports after adding 58 primary connections with RCA = 0 as in simulation 1 and doubling all exports of the 630 primary connections with RCA between zero and one	35.822
Simulation 3: Potential Merchandise Exports after doubling all exports of the 630 primary connections with RCA between zero and one and doubling the potential export value of the 58 primary connections with RCA = 0 in simulation 1	37.446

Source: Authors' Calculations

Policy Recommendations

It is crucial for Pakistan to adopt an export-oriented industrial strategy as its current export basket is heavily concentrated in low-value-added sectors such as textiles and basic agricultural goods. To enhance export revenues, policies should focus on moving up the value chain by promoting sectors with higher PCI values. Policy makers should prioritize products and sectors identified in Scenarios 1, 2, and 3, which highlight high-value-added products that Pakistan could produce and export. Furthermore, policy makers should prioritize products that are technologically similar to those already exported, leveraging Pakistan's existing productive capabilities for seamless diversification. These products include 'coke from coal', 'railway freight cars', and 'malt', as well as products like 'plastic goods' and 'machinery components', which offer substantial growth potential. Additionally, the production and export of more complex products, such as 'machinery parts', 'unwrought nickel', and 'plastic products' could substantially boost export revenues, depending on the scale of implementation. A targeted, product-specific export strategy is essential for achieving these goals. Policymakers should focus on sectors with the highest potential for growth and economic complexity, ensuring that resources are strategically allocated to industries promising the highest returns in terms of export diversification, export growth and revenue.

To stimulate the production of these high-value-added products, the government can introduce export prizes or incentives for firms that successfully export products identified. Additionally, creating financial support mechanisms can enable exporters to access affordable financing for upgrading production capabilities. For instance, sectors identified in the product space analysis should receive priority in accessing export financing, particularly in industries such as

'electrical machinery' and 'metals'. Investment in export infrastructure— such as ports, roads, and electricity—is crucial to support efficient trade in high-value-added products. This will enable firms to meet global standards and improve their competitiveness in foreign markets. Furthermore, establishing Special Economic Zones (SEZs) that focus on producing products with high connectedness, as identified in Scenarios 1, 2, and 3 can be beneficial. These SEZs should offer businesses tax breaks, subsidies, and infrastructure support to facilitate the production and export of more complex products, such as machinery parts or chemical woodpulp.

To enhance targeted market access and empower foreign missions, Pakistan's trade and investment officers should be trained to actively promote and connect foreign buyers with domestic producers in sectors identified in various scenarios. Their efforts should focus on expanding high-value exports such as machinery and metals which hold significant potential. When negotiating trade agreements, negotiators should prioritize these high-potential products to ensure increased market access. For example, securing preferential terms for exporting products like 'malt' or 'machinery components' can provide Pakistani producers with a competitive edge. Additionally, trade and investment officers should actively collaborate with exporters to build partnerships in global markets, particularly for products where Pakistan has a revealed comparative advantage or connectedness.

Policymakers should focus on reducing tariffs on critical foreign inputs necessary for producing higher value-added, connected products. Lowering input costs will make it easier for domestic producers to compete internationally and scale production in complex sectors like metals, chemicals, and machinery. Reducing tariffs should be coupled with efforts to improve supply chains and enhance access to essential components and raw materials for producing sophisticated products. This approach will enable Pakistan to transition from lower-value-added exports to more complex and higher-margin products.

Next, the government should incentivize investment in research and development, focusing on sectors that produce high-complexity products such as machinery and chemicals. Investment in R&D will ensure that firms are equipped with the technology and knowledge required to produce export-competitive goods. Collaboration with international partners for technology transfer is also crucial. Such expertise will allow Pakistani producers to compete in sectors identified for expansion, such as machinery and complex industrial goods. Collaborations with international firms can accelerate the development of Pakistan's capacity to produce high-complexity products. Additionally, by encouraging foreign investment in complex industries, Pakistan can leverage foreign expertise to enhance domestic production and export capabilities.

Lastly, building capacity for export promotion is essential. The government should ensure that trade and investment officers are trained to identify market opportunities for products identified in the product space analysis. These officers should be equipped with knowledge about priority sectors and products, enabling them to effectively connect Pakistani producers with global buyers. Establishing better coordination between government ministries, trade agencies, and foreign missions is imperative to ensure a cohesive export strategy focused on identified high-value-added products. This coordination is essential for aligning trade agreements, tariff policies, and export incentives.

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Appendix A:

Scenario 1: The Primary Connections with the goods exported by Pakistan in 2021 which have RCA equal to zero

HS 1992 Code	Product	PCI	Sectors
2843	Colloidal precious metals; inorganic or organic compounds of precious metals, whether or not chemically defined; amalgams of precious metals	2.2380	Chemicals
3818	Chemical element/compound wafers doped for electronic	2.0578	Chemicals
8457	Machining centers, unit construction machines (single station) and multistation transfer machines, for working metal	2.0096	Machinery
3702	Photographic film in rolls, sensitized, unexposed, of any material other than paper, paperboard or textiles; instant print film in rolls, sensitized, unexposed	2.0025	Chemicals
3914	Ion-exchangers based on polymers of headings 3901 to 3913, in primary forms	1.8728	Chemicals
7221	Bars and rods, stainless steel, hot-rolled, irreg coils	1.7258	Metals
2931	Other organo-inorganic compounds	1.6523	Chemicals
2907	Phenols; phenol-alcohols	1.3227	Chemicals
7006	Glass of heading 7003, 7004 or 7005, bent, edge-worked, engraved, drilled, enameled or otherwise worked, but not framed or fitted with other materials:	1.2541	Stone
2935	Sulfonamides	1.2007	Chemicals
7410	Copper foil (whether or not printed or backed with paper, paperboard, plastics or similar backing materials) of a thickness(excluding any backing) not exceeding 0.15 mm	1.0889	Metals
2929	Compounds with other nitrogen function	1.0671	Chemicals
7507	Nickel tubes, pipes and tube or pipe fittings (for example, couplings, elbows,sleeves)	0.9859	Metals
8104	Magnesium and articles thereof, including waste and scrap	0.9702	Metals
8601	Rail locomotives powered from an external source of electricity or by electric accumulators (batteries)	0.9321	Vehicles
3812	Prepared rubber accelerators; compound plasticizers for rubber or plastics, not elsewhere specified or included; antioxidizing preparations and other compound stabilizers for rubber or plastics	0.9179	Chemicals
2926	Nitrile-function compounds	0.8937	Chemicals
8102	Molybdenum and articles thereof, including waste and scrap	0.8772	Metals
8476	Automatic goods-vending machines (for example, postage stamp, cigarette, food or beverage machines), including money-changing machines; parts thereof	0.8503	Machinery
7302	Railway or tramway track construction material of iron or steel, the following rails, check-rails and rack rails, switch blades, crossing frogs, point rods and other crossing pieces, sleepers (cross-ties), fish-plates, chairs, chair wedges, sole plates (b	0.7275	Metals
8303	Armored or reinforced safes, strong-boxes and doors and safe deposit lockers for strong-rooms, cash or deed boxes and the like, and parts thereof, of base metal	0.7263	Metals
203	Meat of swine, fresh, chilled or frozen	0.7246	Agriculture

Product Space: Exploring potential for higher exports in Pakistan

HS 1992 Code	Product	PCI	Sectors
7305	Other tubes and pipes (for example, welded, riveted or similarly closed), having circular cross sections, the external diameter of which exceeds 406.4 mm, of iron or steel	0.7203	Metals
3703	Photographic paper, paperboard and textiles, sensitized, unexposed	0.7123	Chemicals
9114	Other clock or watch parts	0.7102	Machinery
9111	Watch cases and parts thereof	0.7077	Machinery
8713	Carriages for disabled persons, whether or not motorized or otherwise mechanically propelled	0.6982	Vehicles
8715	Baby carriages (including strollers) and parts thereof	0.5667	Vehicles
7301	Sheet piling of iron or steel, whether or not drilled, punched or made from assembled elements; welded angles, shapes and sections, of iron or steel	0.5184	Metals
8805	Aircraft launching gear; deck-arrestor or similar gear; ground flying trainers; parts of the foregoing articles	0.5001	Vehicles
8605	Railway or tramway passenger coaches, not self- propelled; luggage vans, post office coaches and other special purpose railway or tramway coaches, not self- propelled (excluding those of heading 8604)	0.4247	Vehicles
2803	Carbon, nesoi (including carbon black)	0.3002	Chemicals
1205	Rape or colza seeds, whether or not broken	0.2241	Agriculture
8604	Railway or tramway maintenance or service vehicles, whether or not self-propelled (for example, workshops, cranes, ballast tampers, trackliners, testing coaches and track inspection vehicles)	0.2119	Vehicles
8112	Beryllium, chromium,germanium, vanadium, gallium, hafnium, indium, niobium (columbium), rhenium and thallium,and articles of these metals, including waste and scrap	0.1860	Metals
7502	Unwrought nickel	0.0549	Metals
8710	Tanks and other armored fighting vehicles, motorized, whether or not fitted with weapons, and parts of such vehicles	0.0166	Vehicles
4301	Raw furskins (including heads, tails, paws and other pieces or cuttings, suitable for furriers' use), other than raw hides and skins of heading 4101, 4102 or 4103	-0.0046	Agriculture
4703	Chemical woodpulp, soda or sulfate, other than dissolving grades	-0.0357	Agriculture
1107	Malt, whether or not roasted	-0.0638	Agriculture
1206	Sunflower seeds	-0.0641	Agriculture
8606	Railway or tramway freight cars, not self-propelled	-0.0826	Vehicles
8111	Manganese and articles thereof, including waste and scrap:	-0.2863	Metals
2704	Coke etc of coal, lignite or peat, retort carbon	-0.3307	Minerals
2716	Electrical energy	-0.4053	Minerals
2204	Wine of fresh grapes, including fortified wines; grape must other than that of heading 2009	-0.5423	Agriculture
1803	Cocoa paste, whether or not defatted	-0.7059	Agriculture
6908	Glazed ceramic flags and paving, hearth or wall tiles; glazed ceramic mosaic cubes and the like, whether or not on a backing	-1.0054	Stone
8902	Fishing vessels; factory ships and other vessels for processing or preserving fishery products	-1.0789	Vehicles
2822	Cobalt oxides and hydroxides; commercial cobalt oxides	-1.1783	Chemicals
3102	Mineral or chemical fertilizers, nitrogenous	-1.2247	Chemicals

HS 1992 Code	Product	PCI	Sectors
8905	Light-vessels, fire-floats, dredgers, floating cranes, and other vessels the navigability of which is subsidiary to their main function; floating docks; floating or submersible drilling or production platforms	-1.3681	Vehicles
2614	Titanium ores and concentrates	-2.1429	Minerals
2612	Uranium or thorium ores and concentrates	-2.3061	Minerals
2711	Petroleum gases and other gaseous hydrocarbons	-2.3400	Minerals
1007	Grain sorghum	-2.3489	Agriculture
1801	Cocoa beans, whole or broken, raw or roasted	-3.0358	Agriculture
2605	Cobalt ores and concentrates	-3.1530	Minerals

Appendix B:

Scenario 2: The Primary Connections with the goods exported by Pakistan in 2021 which have RCA greater than zero and less than one

HS 1992 Code	Product	RCA	PCI	Sectors
9010	Apparatus and equipment for photographic (including cinematographic) laboratories, not specified or included elsewhere in this chapter; negatoscopes; projection screens; parts and accessories thereof	0.0073	2.2693	Machinery
9012	Microscopes other than optical microscopes; diffraction apparatus; parts and accessories thereof	0.0038	2.0911	Machinery
8479	Machines and mechanical appliances having individual functions, not specified or included elsewhere in this chapter; parts thereof	0.0127	2.0401	Machinery
8461	Machine tools for planing, shaping, slotting, broaching, gear cutting, gear grinding or gear finishing, sawing, cutting-off and other machine tools working by removing metal or cermets, not elsewhere specified or included	0.0048	1.9566	Machinery
3910	Silicones in primary forms	0.0392	1.9348	Chemicals
8420	Calendering or other rolling machines, other than for metals or glass, and cylinders therefor; parts thereof	0.2840	1.8826	Machinery
8209	Of other cermets	0.0047	1.8286	Metals
2910	Epoxides, epoxyalcohols, epoxyphenols and epoxyethers, with a three-membered ring, and their halogenated, sulfonated, nitrated or nitrosated derivatives	0.0002	1.8246	Chemicals
3403	Lubricating preparations (including cutting-oil preparations, bolt or nut release preparations, antirust or anticorrosion preparations and mold release preparations, based on lubricants) and preparations of a kind used for the oil or grease treatment of t	0.0107	1.7865	Chemicals
9027	Instruments and apparatus for physical or chemical analysis (for example, polarimeters, refractometers, spectrometers, gas or smoke analysis apparatus); instruments and apparatus for measuring or checking viscosity, porosity, expansion, surface tension or	0.0267	1.7726	Machinery
3908	Polyamides in primary forms	0.0277	1.7690	Chemicals

Product Space: Exploring potential for higher exports in Pakistan

HS 1992 Code	Product	RCA	PCI	Sectors
8456	Machine tools for working any material by removal of material, by laser or other light or photon beam, ultrasonic, electro-discharge, electro-chemical, electron-beam, ionic-beam or plasma arc processes	0.0295	1.7640	Machinery
8458	Lathes (including turning centers) for removing metal	0.1010	1.7342	Machinery
3707	Chemical preparations for photographic uses (other than varnishes, glues, adhesives and similar preparations); unmixed products for photographic uses, put up in measured portions or put up for retail sale in a form ready for use	0.0009	1.7172	Chemicals
8481	Taps, cocks, valves and similar appliances, for pipes, boiler shells, tanks, vats or the like, including pressure-reducing valves and thermostatically controlled valves; parts thereof	0.0159	1.7168	Machinery
8477	Machinery for working rubber or plastics or for the manufacture of products from these materials, not specified or included elsewhere in this chapter; parts thereof	0.0537	1.7122	Machinery
8208	Knives and cutting blades, for machines or for mechanical appliances, and base metal parts thereof	0.0975	1.7077	Metals
7220	Flat-rolled products of stainless steel, of a width of less than 600 mm	0.0008	1.6869	Metals
3002	Human blood; animal blood prepared for therapeutic, prophylactic or diagnostic uses; antisera and other blood fractions and modified immunological products, whether or not obtained by means of biotechnological processes; vaccines, toxins, cultures of micro-organisms	0.0007	1.6790	Chemicals
9024	Machines and appliances for testing the hardness, strength, compressibility, elasticity or other mechanical properties of materials (for example, metals, wood, textiles, paper, plastics), and parts and accessories thereof	0.0557	1.6659	Machinery
4806	Vegetable parchment, greaseproof papers, tracing papers and glassine and other glazed transparent or translucent papers, in rolls or sheets	0.0169	1.6471	Agriculture
9031	Measuring or checking instruments, appliances and machines, not specified or included elsewhere in this chapter; profile projectors; parts and accessories thereof	0.0159	1.6317	Machinery
8439	Machinery for making pulp of fibrous cellulosic material or for making or finishing paper or paperboard (other than the machinery of heading 8419); parts thereof	0.0223	1.6186	Machinery
8475	Machines for assembling electric or electronic lamps, tubes or flashbulbs, in glass envelopes; machines for manufacturing or hot working glass or glassware; parts thereof	0.0152	1.6185	Machinery
7318	Screws, bolts, nuts, coach screws, screw hooks, rivets, cotters, cotter pins, washers (including spring washers) and similar articles, of iron or steel	0.0382	1.6178	Metals
3701	Photographic plates and film in the flat, sensitized, unexposed, of any material other than paper, paperboard or textiles; instant print film in the flat, sensitized, unexposed, whether or not in packs	0.0310	1.6055	Chemicals

HS 1992 Code	Product	RCA	PCI	Sectors
8523	Discs, tapes, solid-state non-volatile storage devices, smart cards and other media for the recording of sound or of other phenomena, whether or not recorded, including matrices and masters for the production of discs, but excluding products of Chapter 37	0.0130	1.6043	Electronics
3810	Pickling preparations for metal surfaces; fluxes and other auxiliary preparations for soldering, brazing or welding; soldering, brazing or welding powders and pastes consisting of metal and other materials; preparations of a kind used as cores or coatings for welding electrodes or rods:	0.0002	1.5877	Chemicals
8460	Machine tools for deburring, sharpening, grinding, honing, lapping, polishing or otherwise finishing metal or cermets by means of grinding stones, abrasives or polishing products, other than gear cutting, gear grinding or gear finishing machines of heading	0.0244	1.5873	Machinery
8207	Interchangeable tools for hand tools, whether or not power-operated, or for machine-tools (for example, for pressing, stamping, punching, tapping, threading, drilling, boring, broaching, milling, turning or screw driving), including dies for drawing or extruding	0.0436	1.5835	Metals
8202	Handsaws, and metal parts thereof; blades for saws of all kinds (including slitting, slotting or toothless saw blades), and base metal parts thereof	0.0088	1.5793	Metals
2914	Ketones and quinones, whether or not with other oxygen function, and their halogenated, sulfonated, nitrated, or nitrosated derivatives	0.0002	1.5548	Chemicals
7222	Other bars and rods of stainless steel; angles, shapes and sections of stainless steel	0.0093	1.5457	Metals
9017	Drawing, marking-out or mathematical calculating instruments (for example, drafting machines, pantographs, protractors, drawing sets, slide rules, disc calculators); instruments for measuring length, for use in the hand (for example, measuring tapes, micrometers)	0.1520	1.5302	Machinery
9108	Watch movements, complete and assembled	0.0023	1.5181	Machinery
8603	Self-propelled railway or tramway coaches, vans and trucks, other than those of heading 8604	0.0177	1.5166	Vehicles
8466	Parts and accessories suitable for use solely or principally with the machines of headings 8456 to 8465, including work or tool holders, self-opening dieheads, dividing heads and other special attachments for machine tools; tool holders for any type of tool	0.0135	1.5134	Machinery
8515	Electric (including electrically heated gas), laser or other light or photon beam, ultrasonic, electron beam, magnetic pulse or plasma arc soldering, brazing or welding machines and apparatus, whether or not capable of cutting; electric machines and apparatus	0.0088	1.5119	Electronics
3506	Prepared glues and other prepared adhesives, not elsewhere specified or included; products suitable for use as glues or adhesives, put up for retail sale as glues or adhesives, not exceeding a net weight of 1 kg	0.0575	1.5118	Chemicals

Product Space: Exploring potential for higher exports in Pakistan

HS 1992 Code	Product	RCA	PCI	Sectors
7226	Flat-rolled products of other alloy steel, of a width of less than 600 mm	0.0212	1.5015	Metals
9022	Apparatus based on the use of X-rays or of alpha, beta or gamma radiations, whether or not for medical, surgical, dental or veterinary uses, including radiography or radiotherapy apparatus, X-ray tubes and other X-ray generators, high tension generators, c	0.0358	1.4960	Machinery
3911	Petroleum resins, coumarone-indene resins, polyterpenes, polysulfides, polysulfones and other products specified in note 3 to this chapter, not elsewhere specified or included, in primary forms	0.0017	1.4775	Chemicals
7315	Chain and parts thereof, of iron or steel	0.0254	1.4722	Metals
7506	Nickel plates, sheets, strip and foil	0.0011	1.4672	Metals
7225	Flat-rolled products of other alloy steel, of a width of 600 mm or more	0.0508	1.4658	Metals
8480	Molding boxes for metal foundry; mold bases; molding patterns; molds for metal (other than ingot molds), metal carbides, glass, mineral materials, rubber or plastics	0.0773	1.4503	Machinery
8462	Machine tools (including presses) for working metal by forging, hammering or die-stamping; machine tools (including presses) for working metal by bending, folding, straightening, flattening, shearing, punching or notching; presses for working metal or met	0.0304	1.4438	Machinery
3906	Acrylic polymers in primary forms	0.0708	1.4435	Chemicals
8408	Compression-ignition internal combustion piston engines (diesel or semi-diesel engines)	0.0094	1.4361	Machinery
8401	Nuclear reactors; fuel elements (cartridges), non-irradiated, for nuclear reactors; machinery and apparatus for isotopic separation; parts thereof	0.0016	1.4173	Machinery
3822	Diagnostic or laboratory reagents on a backing and prepared diagnostic or laboratory reagents, whether or not on a backing, other than those of heading 3002 or 3006; certified reference materials	0.0065	1.4171	Chemicals
8482	Ball or roller bearings, and parts thereof	0.0065	1.4145	Machinery
9209	Parts (for example, mechanisms for music boxes) and accessories (for example, cards, discs and rolls for mechanical instruments) of musical instruments; metronomes, tuning forks and pitch pipes of all kinds	0.2380	1.4071	Machinery
8543	Electrical machines and apparatus, having individual functions, not specified or included elsewhere in this chapter; parts thereof	0.0092	1.4042	Electronics
8414	Air or vacuum pumps, air or other gas compressors and fans; ventilating or recycling hoods incorporating a fan, whether or not fitted with filters; parts thereof	0.2430	1.3865	Machinery
3905	Polymers of vinyl acetate or of other vinyl esters, in primary forms; other vinyl polymers in primary forms	0.0916	1.3822	Chemicals
8448	Auxiliary machinery for use with machines of heading 8444, 8445, 8446 or 8447 (for example, dobbies, Jacquards, automatic stop motions and shuttle changing mechanisms); parts and accessories suitable for use solely or principally with the machines of this	0.3620	1.3737	Machinery

HS 1992 Code	Product	RCA	PCI	Sectors
2916	Unsaturated acyclic monocarboxylic acids, cyclic monocarboxylic acids, their anhydrides, halides, peroxides and peroxyacids; their halogenated, sulfonated, nitrated or nitrosated derivatives	0.1200	1.3687	Chemicals
2934	Nucleic acids and their salts, whether or not chemically defined; other heterocyclic compounds	0.0365	1.3670	Chemicals
8464	Machine tools for working stone, ceramics, concrete, asbestos-cement or like mineral materials or for cold working glass	0.0144	1.3655	Machinery
2920	Esters of other inorganic acids of nonmetals (excluding esters of hydrogen halides) and their salts; their halogenated, sulfonated, nitrated or nitrosated derivatives	0.0060	1.3548	Chemicals
9030	Oscilloscopes, spectrum analyzers and other instruments and apparatus for measuring or checking electrical quantities, excluding meters of heading 9028; instruments and apparatus for measuring or detecting alpha, beta, gamma, X-ray, cosmic or other ionizing	0.0577	1.3231	Machinery
8419	Machinery, plant or laboratory equipment, whether or not electrically heated (excluding furnaces, ovens and other equipment of heading 8514), for the treatment of materials by a process involving a change of temperature such as heating, cooking, roasting,	0.0124	1.3214	Machinery
8483	Transmission shafts (including camshafts and crankshafts) and cranks; bearing housings, housed bearings and plain shaft bearings; gears and gearing; ball or roller screws; gear boxes and other speed changers, including torque converters; flywheels and pul	0.0290	1.3137	Machinery
8445	Machines for preparing textile fibers; spinning, doubling or twisting machines and other machinery for producing textile yarns; textile reeling or winding (including weft winding) machines and machines for preparing textile yarns for use on the machines o	0.1570	1.3126	Machinery
8413	Pumps for liquids, whether or not fitted with a measuring device; liquid elevators; part thereof	0.0528	1.3100	Machinery
7307	Tube or pipe fittings (for example, couplings, elbows, sleeves), of iron or steel	0.0105	1.3071	Metals
9002	Lenses, prisms, mirrors and other optical elements, of any material, mounted, being parts of or fittings for instruments or apparatus, other than such elements of glass not optically worked; parts and accessories thereof	0.0019	1.3060	Machinery
3801	Artificial graphite; colloidal or semi-colloidal graphite; preparations based on graphite or other carbon in the form of pastes, blocks, plates or other semimanufactures	0.0055	1.2941	Chemicals
8407	Spark-ignition reciprocating or rotary internal combustion piston engines	0.1470	1.2938	Machinery
8427	Fork-lift trucks; other works trucks fitted with lifting or handling equipment	0.0043	1.2917	Machinery
8406	Steam turbines and other vapor turbines, and parts thereof	0.2170	1.2878	Machinery

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HS 1992 Code	Product	RCA	PCI	Sectors
8451	Machinery (other than machines of heading 8450) for washing, cleaning, wringing, drying, ironing, pressing (including fusing presses), bleaching, dyeing, dressing, finishing, coating or impregnating textile yarns, fabrics or made up textile articles and m	0.0404	1.2862	Machinery
8485	Machinery parts, not containing electrical connectors, insulators, coils, contacts or other electrical features, not specified or included elsewhere in this Chapter.	0.0879	1.2854	Machinery
2921	Amine-function compounds	0.0149	1.2639	Chemicals
7223	Wire of stainless steel:	0.0061	1.2605	Metals
8473	Parts and accessories (other than covers, carrying cases and the like) suitable for use solely or principally with machines of headings 8469 to 8472	0.0033	1.2558	Machinery
5502	Artificial filament tow	0.0524	1.2549	Textiles
8422	Dishwashing machines; machinery for cleaning or drying bottles or other containers; machinery for filling, closing, sealing or labeling bottles, cans, boxes, bags or other containers; machinery for capsuling bottles, jars, tubes and similar containers; ot	0.1990	1.2544	Machinery
6804	Millstones, grindstones, grinding wheels and the like, without frameworks, for grinding, sharpening, polishing, trueing or cutting, hand sharpening or polishing stones, and parts thereof, of natural stone, of agglomerated natural or artificial abrasives,	0.0174	1.2535	Stone
9033	Parts and accessories (not specified or included elsewhere in this chapter) for machines, appliances, instruments or apparatus of chapter 90	0.1280	1.2498	Machinery
8416	Furnace burners for liquid fuel, for pulverized solid fuel or for gas; mechanical stokers, including their mechanical grates, mechanical ash dischargers and similar appliances; parts thereof	0.0060	1.2431	Machinery
8467	Tools for working in the hand, pneumatic, hydraulic or with self-contained electric or nonelectric motor, and parts thereof	0.0108	1.2334	Machinery
7218	Stainless steel in ingots or other primary forms; semi-finished products of stainless steel	0.0820	1.2334	Metals
8508	Vacuum cleaners; parts thereof	0.0024	1.2241	Electronics
2933	Heterocyclic compounds with nitrogen hetero-atom(s) only	0.0293	1.2212	Chemicals
9013	Liquid crystal devices not constituting articles provided for more specifically in other headings; lasers, other than laser diodes; other optical appliances and instruments, not specified or included elsewhere in this chapter; parts and accessories thereo	0.0006	1.2177	Machinery
9014	Direction finding compasses; other navigational instruments and appliances; parts and accessories thereof	0.0729	1.2156	Machinery
3507	Enzymes; prepared enzymes not elsewhere specified or included	0.0086	1.2089	Chemicals
8532	Electrical capacitors, fixed, variable or adjustable (pre-set); parts thereof	0.0170	1.2087	Electronics

HS 1992 Code	Product	RCA	PCI	Sectors
8517	Telephone sets, including telephones for cellular networks or for other wireless networks; other apparatus for the transmission or reception of voice, images or other data, including apparatus for communication in a wired or wireless network (such as a local area network)	0.0409	1.2031	Electronics
8708	Parts and accessories of the motor vehicles of headings 8701 to 8705	0.0366	1.1989	Vehicles
8505	Electromagnets; permanent magnets and articles intended to become permanent magnets after magnetization; electromagnetic or permanent magnet chucks, clamps and similar holding devices; electromagnetic couplings, clutches and brakes; electromagnetic lifting	0.0361	1.1952	Electronics
8507	Electric storage batteries, including separators therefor, whether or not rectangular (including square); parts thereof	0.1770	1.1898	Electronics
8506	Primary cells and primary batteries; parts thereof	0.1340	1.1803	Electronics
8404	Auxiliary plant for use with boilers of heading 8402 or 8403 (for example, economizers, super-heaters, soot removers, gas recoverers); condensers for steam or other vapor power units; parts thereof	0.0343	1.1759	Machinery
6909	Ceramic wares for laboratory, chemical or other technical uses; ceramic troughs, tubs and similar receptacles of a kind used in agriculture; ceramic pots, jars and similar articles of a kind used for the conveyance or packing of goods	0.0010	1.1644	Stone
2922	Oxygen-function amino-compounds	0.0010	1.1565	Chemicals
4005	Compounded rubber, unvulcanized, in primary forms or in plates, sheets or strip	0.0290	1.1562	Chemicals
6805	Natural or artificial abrasive powder or grain, on a base of textile material, of paper, of paperboard or of other materials, whether or not cut to shape or sewn or otherwise made up	0.0059	1.1538	Stone
3912	Cellulose and its chemical derivatives, not elsewhere specified or included, in primary forms	0.0115	1.1418	Chemicals
7219	Flat-rolled products of stainless steel, of a width of 600 mm or more	0.0144	1.1379	Metals
9032	Automatic regulating or controlling instruments and apparatus; parts and accessories thereof	0.0161	1.1370	Machinery
3909	Amino-resins, phenolic resins and polyurethanes, in primary forms	0.0145	1.1370	Chemicals
8542	Electronic integrated circuits; parts thereof	0.0004	1.1333	Electronics
2936	Provitamins and vitamins, natural or reproduced by synthesis (including natural concentrates), derivatives thereof used primarily as vitamins, and intermixtures of the foregoing, whether or not in any solvent	0.0162	1.1264	Chemicals
8454	Converters, ladles, ingot molds and casting machines, of a kind used in metallurgy or in metal foundries, and parts thereof	0.1200	1.1263	Machinery
9011	Compound optical microscopes, including those for photomicrography, cinemicrography or microprojection; parts and accessories thereof	0.0032	1.1255	Machinery

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HS 1992 Code	Product	RCA	PCI	Sectors
3919	Self-adhesive plates, sheets, film, foil, tape, strip and other flat shapes, of plastics, whether or not in rolls	0.0055	1.1195	Chemicals
9026	Instruments and apparatus for measuring or checking the flow, level, pressure or other variables of liquids or gases (for example, flow meters, level gauges, manometers, heat meters), excluding instruments and apparatus of heading 9014, 9015, 9028 or 9032	0.0357	1.1184	Machinery
3821	Prepared culture media for development or maintenance of micro-organisms (including viruses and the like) or of plant, human or animal cells	0.0014	1.1164	Chemicals
2912	Aldehydes, whether or not with other oxygen function; cyclic polymers of aldehydes; paraformaldehyde	0.0266	1.1115	Chemicals
9612	Typewriter or similar ribbons, inked or otherwise prepared for giving impressions, whether or not on spools or in cartridges; ink pads, whether or not inked, with or without boxes	0.0017	1.1059	Machinery
5903	Textile fabrics impregnated, coated, covered or laminated with plastics, other than those of heading 5902	0.3580	1.0999	Textiles
3005	Wadding, gauze, bandages and similar articles (for example, dressings, adhesive plasters, poultices), impregnated or coated with pharmaceutical substances or put up in forms or packings for retail sale for medical, surgical, dental or veterinary purposes	0.2720	1.0958	Chemicals
5906	Rubberized textile fabrics, other than those of heading 5902	0.3950	1.0894	Textiles
8465	Machine tools (including machines for nailing, stapling, glueing or otherwise assembling) for working wood, cork, bone, hard rubber, hard plastics or similar hard materials	0.0134	1.0879	Machinery
7508	Other articles of nickel	0.0087	1.0856	Metals
2941	Antibiotics	0.0247	1.0811	Chemicals
8431	Parts suitable for use solely or principally with the machinery of headings 8425 to 8430	0.0684	1.0807	Machinery
5911	Textile products and articles, for technical uses, specified in note 7 to this chapter	0.2600	1.0802	Textiles
8703	Motor cars and other motor vehicles principally designed for the transport of persons (other than those of heading 8702), including station wagons and racing cars	0.0016	1.0750	Vehicles
8546	Electrical insulators of any material	0.0771	1.0707	Electronics
7002	Glass in balls (other than microspheres of heading 7018), rods or tubes, unworked	0.1090	1.0691	Stone
8526	Radar apparatus, radio navigational aid apparatus and radio remote control apparatus	0.0337	1.0689	Electronics
2930	Organo-sulfur compounds	0.0022	1.0668	Chemicals
8204	Hand-operated spanners and wrenches (including torque meter wrenches but not including tap wrenches); socket wrenches, with or without handles, drives or extensions; base metal parts thereof	0.0195	1.0661	Metals
8471	Automatic data processing machines and units thereof; magnetic or optical readers, machines for transcribing data onto data media in coded form and machines for processing such data, not elsewhere specified or included	0.0046	1.0497	Machinery

HS 1992 Code	Product	RCA	PCI	Sectors
3815	Reaction initiators, reaction accelerators and catalytic preparations, not elsewhere specified or included	0.2900	1.0493	Chemicals
8443	Printing machinery used for printing by means of plates, cylinders and other printing components of heading 8442; other printers, copying machines and facsimile machines, whether or not combined; parts and accessories thereof	0.0226	1.0475	Machinery
8459	Machine tools (including way-type unit head machines) for drilling, boring, milling, threading or tapping by removing metal, other than lathes (including turning centers) of heading 8458	0.0088	1.0459	Machinery
8484	Gaskets and similar joints of metal sheeting combined with other material or of two or more layers of metal; sets or assortments of gaskets and similar joints, dissimilar in composition, put up in pouches, envelopes or similar packings; mechanical seals	0.2150	1.0441	Machinery
8428	Other lifting, handling, loading or unloading machinery (for example, elevators, escalators, conveyors, teleferics)	0.0099	1.0399	Machinery
7412	Copper tube or pipe fittings (for example couplings, elbows, sleeves)	0.0034	1.0386	Metals
8307	Flexible tubing of base metal, with or without fittings	0.0150	1.0313	Metals
8530	Electrical signaling, safety or traffic control equipment for railways, streetcar lines, subways, roads, inland waterways, parking facilities, port installations or airfields (other than those of heading 8608); parts thereof	0.0016	1.0274	Electronics
8701	Tractors (other than tractors of heading 8709)	0.4670	1.0226	Vehicles
9402	Medical, surgical, dental or veterinary furniture (for example, operating tables, examination tables, hospital beds with mechanical fittings, dentists' chairs); barbers' chairs and similar chairs, having rotating as well as both reclining and elevating motion	0.0358	1.0179	Textiles
2937	Hormones, prostaglandins, thromboxanes and leukotrienes, natural or reproduced by synthesis; derivatives and structural analogues thereof, including chain modified polypeptides, used primarily as hormones	0.0018	1.0147	Chemicals
8440	Bookbinding machinery, including book-sewing machines, and parts thereof	0.0059	1.0131	Machinery
8421	Centrifuges, including centrifugal dryers; filtering or purifying machinery and apparatus, for liquids or gases; parts thereof	0.0695	1.0042	Machinery
6903	Other refractory ceramic goods (for example, retorts, crucibles, muffles, nozzles, plugs, supports, cupels, tubes, pipes, sheaths and rods), other than those of siliceous fossil meals or of similar siliceous earths	0.0071	1.0026	Stone
7229	Wire of other alloy steel	0.2540	1.0013	Metals
8541	Diodes, transistors and similar semiconductor devices; photosensitive semiconductor devices, including photovoltaic cells whether or not assembled in modules or made up into panels; light-emitting diodes; mounted piezoelectric crystals; parts thereof	0.0012	0.9929	Electronics

Product Space: Exploring potential for higher exports in Pakistan

HS 1992 Code	Product	RCA	PCI	Sectors
9001	Optical fibers and optical fiber bundles; optical fiber cables other than those of heading 8544; sheets and plates of polarizing material; lenses (including contact lenses), prisms, mirrors and other optical elements, of any material, unmounted, other than	0.0054	0.9915	Machinery
8468	Machinery and apparatus for soldering, brazing or welding, whether or not capable of cutting, other than those of heading 8515; gas-operated surface tempering machines and appliances; parts thereof	0.0111	0.9852	Machinery
7320	Springs and leaves for springs, of iron or steel	0.0073	0.9833	Metals
8205	Hand tools (including glass cutters) not elsewhere specified or included; blowtorches and similar self-contained torches; vises, clamps and the like, other than accessories for and parts of machine tools; anvils; portable forges; hand- or pedal-operated	0.8580	0.9795	Metals
8510	Shavers, hair clippers and hair-removing appliances, with self-contained electric motor; parts thereof	0.0050	0.9771	Electronics
7505	Nickel bars, rods, profiles and wire	0.0024	0.9761	Metals
8463	Other machine tools for working metal or cermets, without removing material	0.0629	0.9755	Machinery
8538	Parts suitable for use solely or principally with the apparatus of heading 8535, 8536 or 8537	0.0135	0.9725	Electronics
5603	Nonwovens, whether or not impregnated, coated, covered or laminated	0.0782	0.9703	Textiles
4010	Conveyor or transmission belts or belting, of vulcanized rubber	0.0084	0.9695	Chemicals
8524	Recorded sound media records, tapes, cassettes, master records, metal matrices, compact discs	0.0285	0.9678	Electronics
8534	Electronic printed circuits	0.0006	0.9673	Electronics
8433	Harvesting or threshing machinery, including straw or fodder balers; grass or hay mowers; machines for cleaning, sorting or grading eggs, fruit or other agricultural produce, other than machinery of heading 8437; parts thereof	0.0459	0.9659	Machinery
8714	Parts and accessories of vehicles of headings 8711 to 8713	0.0369	0.9635	Vehicles
8512	Electrical lighting or signaling equipment (excluding articles of heading 8539), windshield wipers, defrosters and demisters, of a kind used for cycles or motor vehicles; parts thereof	0.0044	0.9618	Electronics
8302	Base metal mountings, fittings and similar articles suitable for furniture, doors, staircases, windows, blinds, coachwork, saddlery, trunks, chests, caskets or the like; base metal hat racks, hat-pegs, brackets and similar fixtures; castors with mountings	0.0568	0.9512	Metals
2932	Heterocyclic compounds with oxygen hetero-atom(s) only	0.0065	0.9475	Chemicals
2903	Halogenated derivatives of hydrocarbons	0.0002	0.9458	Chemicals
9021	Orthopedic appliances, including crutches, surgical belts and trusses; splints and other fracture appliances; artificial parts of the body; hearing aids and other appliances which are worn or carried, or implanted in the body, to compensate for a defect or	0.0457	0.9451	Machinery

HS 1992 Code	Product	RCA	PCI	Sectors
9504	Articles for arcade, table or parlor games, including pinball machines, bagatelle, billiards and special tables for casino games; automatic bowling alley equipment; parts and accessories thereof	0.0133	0.9391	Machinery
8301	Padlocks and locks (key, combination or electrically operated), of base metal; clasps and frames with clasps, incorporating locks, of base metal; keys and parts of any of the foregoing articles, of base metal	0.0079	0.9374	Metals
7326	Other articles of iron or steel	0.1280	0.9343	Metals
8436	Other agricultural, horticultural, forestry, poultry-keeping or bee-keeping machinery, including germination plant fitted with mechanical or thermal equipment; poultry incubators and brooders; parts thereof	0.0149	0.9191	Machinery
8504	Electrical transformers, static converters (for example, rectifiers) and inductors; parts thereof	0.0327	0.9125	Electronics
8709	Works trucks, self-propelled, not fitted with lifting or handling equipment, of the type used in factories, warehouses, dock areas or airports for short distance transport of goods; tractors of the type used on railway station platforms; parts of the foregoing	0.0252	0.9015	Vehicles
3913	Natural polymers (for example, alginic acid) and modified natural polymers (for example, hardened proteins, chemical derivatives of natural rubber), not elsewhere specified or included, in primary forms	0.1460	0.8971	Chemicals
8425	Pulley tackle and hoists other than skip hoists; winches and capstans; jacks	0.0471	0.8950	Machinery
4902	Newspapers, journals and periodicals, whether or not illustrated or containing advertising material	0.0173	0.8908	Agriculture
8514	Industrial or laboratory electric furnaces and ovens (including those functioning by induction or dielectric loss); other industrial or laboratory equipment for the heat treatment of materials by induction or dielectric loss; parts thereof	0.0561	0.8903	Electronics
8547	Insulating fittings for electrical machines, appliances or equipment, being fittings wholly of insulating material apart from any minor components of metal (for example, threaded sockets) incorporated during molding solely for the purposes of assembly, other	0.0073	0.8891	Electronics
8472	Other office machines (for example, hectograph or stencil duplicating machines, addressing machines, automatic banknote dispensers, coin-sorting machines, coin-counting or wrapping machines, pencil-sharpening machines, perforating or stapling machines)	0.0048	0.8853	Machinery
8501	Electric motors and generators (excluding generating sets)	0.0856	0.8824	Electronics
8424	Mechanical appliances (whether or not hand operated) for projecting, dispersing or spraying liquids or powders; fire extinguishers, whether or not charged; spray guns and similar appliances; steam or sand blasting machines and similar jet projecting machines	0.0123	0.8789	Machinery
7020	Other articles of glass:	0.0095	0.8757	Stone
8716	Trailers and semi-trailers; other vehicles, not mechanically propelled; and parts thereof	0.0258	0.8742	Vehicles

Product Space: Exploring potential for higher exports in Pakistan

HS 1992 Code	Product	RCA	PCI	Sectors
8503	Parts suitable for use solely or principally with the machines of heading 8501 or 8502:	0.0276	0.8657	Electronics
7211	Flat-rolled products of iron or nonalloy steel, of a width of less than 600 mm, not clad, plated or coated	0.1800	0.8619	Metals
4908	Transfers (decalcomanias)	0.0811	0.8604	Agriculture
4008	Plates, sheets, strip, rods and profile shapes, of vulcanized rubber other than hard rubber	0.0174	0.8557	Chemicals
3004	Medicaments (excluding goods of heading 3002, 3005 or 3006) consisting of mixed or unmixed products for therapeutic or prophylactic uses, put up in measured doses (including those in the form of transdermal administration systems) or in forms or packings	0.4060	0.8515	Chemicals
8308	Clasps, frames with clasps, buckles, buckle clasps, hooks, eyes, eyelets and the like and parts thereof, of base metal, of a kind used for clothing, footwear, awnings, handbags, travel goods or other made up articles; tubular or bifurcated rivets of base m	0.1960	0.8512	Metals
9029	Revolution counters, production counters, taximeters, odometers, pedometers and the like; speedometers and tachometers, other than those of heading 9014 or 9015; stroboscopes; parts and accessories thereof	0.0016	0.8495	Machinery
3001	Glands and other organs for organotherapeutic uses, dried, whether or not powdered; extracts of glands or other organs or of their secretions for organotherapeutic uses; heparin and its salts; other human or animal substances prepared for therapeutic or p	0.0108	0.8436	Chemicals
7419	Other articles of copper	0.0699	0.8404	Metals
7212	Flat-rolled products of iron or nonalloy steel, of a width of less than 600 mm, clad, plated or coated	0.3350	0.8392	Metals
8305	Fittings for looseleaf binders or files, letter clips, letter corners, paper clips, indexing tags and similar office articles, and parts thereof, of base metal; staples in strips (for example, for offices, upholstery, packaging), of base metal	0.1250	0.8375	Metals
8533	Electrical resistors (including rheostats and potentiometers), other than heating resistors; parts thereof	0.0037	0.8333	Electronics
8455	Metal-rolling mills and rolls therefor; parts thereof	0.0491	0.8318	Machinery
8511	Electrical ignition or starting equipment of a kind used for spark-ignition or compression-ignition internal combustion engines (for example, ignition magnetos, magneto-dynamos, ignition coils, spark plugs and glow plugs, starter motors); generators (for	0.0169	0.8317	Electronics
7205	Granules and powders, of pig iron, spiegeleisen, iron or steel	0.0346	0.8288	Metals
4801	Newsprint	0.0094	0.8272	Agriculture
9305	Parts and accessories of articles of headings 9301 to 9304	0.0625	0.8230	Machinery
6815	Articles of stone or of other mineral substances (including carbon fibers, articles of carbon fibers and articles of peat), not elsewhere specified or included	0.7990	0.8225	Stone
8434	Milking machines and dairy machinery, and parts thereof	0.1590	0.8213	Machinery
8412	Other engines and motors, and parts thereof	0.0092	0.8189	Machinery

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HS 1992 Code	Product	RCA	PCI	Sectors
8525	Transmission apparatus for radio-broadcasting or television, whether or not incorporating reception apparatus or sound recording or reproducing apparatus; television cameras, digital cameras and video camera recorders	0.0092	0.8175	Electronics
3215	Printing ink, writing or drawing ink and other inks, whether or not concentrated or solid	0.0193	0.8139	Chemicals
8545	Carbon electrodes, carbon brushes, lamp carbons, battery carbons and other articles of graphite or other carbon, with or without metal, of a kind used for electrical purposes	0.0022	0.8110	Electronics
2917	Polycarboxylic acids, their anhydrides, halides, peroxides and peroxyacids; their halogenated, sulfonated, nitrated or nitrosated derivatives	0.4050	0.8081	Chemicals
2915	Saturated acyclic monocarboxylic acids and their anhydrides, halides, peroxides and peroxyacids; their halogenated, sulfonated, nitrated or nitrosated derivatives	0.0092	0.8033	Chemicals
8531	Electric sound or visual signaling apparatus (for example, bells, sirens, indicator panels, burglar or fire alarms), other than those of heading 8512 or 8530; parts thereof	0.0506	0.7987	Electronics
8706	Chassis fitted with engines, for the motor vehicles of headings 8701 to 8705:	0.0864	0.7976	Vehicles
2708	Pitch and pitch coke, obtained from coal tar or from other mineral tars	0.0010	0.7973	Minerals
8522	Parts and accessories suitable for use solely or principally with the apparatus of headings 8519 to 8521	0.0326	0.7952	Electronics
8411	Turbojets, turbo propellers and other gas turbines, and parts thereof	0.0778	0.7945	Machinery
8446	Weaving machines (looms)	0.9880	0.7933	Machinery
8417	Industrial or laboratory furnaces and ovens, including incinerators, nonelectric, and parts thereof	0.0518	0.7867	Machinery
6806	Slag wool, rock wool and similar mineral wools; exfoliated vermiculite, expanded clays, foamed slag and similar expanded mineral materials; mixtures and articles of heat-insulating, sound-insulating or sound-absorbing mineral materials, other than those of	0.0012	0.7858	Stone
3212	Pigments (including metallic powders and flakes) dispersed in nonaqueous media, in liquid or paste form, of a kind used in the manufacture of paints (including enamels); stamping foils; dyes and other coloring matter put up in forms or packings for retail	0.1970	0.7828	Chemicals
2902	Cyclic hydrocarbons	0.0009	0.7826	Chemicals
9004	Spectacles, goggles and the like, corrective, protective or other	0.2190	0.7730	Machinery
3207	Prepared pigments, prepared opacifiers and prepared colors, vitrifiable enamels and glazes, engobes (slips), liquid lustres and similar preparations, of a kind used in the ceramic, enamelling or glass industry; glass frit and other glass, in the form of p	0.0036	0.7723	Chemicals

Product Space: Exploring potential for higher exports in Pakistan

HS 1992 Code	Product	RCA	PCI	Sectors
7322	Radiators for central heating, not electrically heated, and parts thereof, of iron or steel; air heaters and hot air distributors (including distributors which can also distribute fresh or conditioned air), not electrically heated, incorporating a motor-d	0.0026	0.7720	Metals
7110	Platinum, unwrought or in semimanufactured forms, or in powder form	0.0058	0.7627	Stone
5309	Woven fabrics of flax	0.2130	0.7571	Textiles
2918	Carboxylic acids with additional oxygen function and their anhydrides, halides, peroxides and peroxyacids; their halogenated, sulfonated, nitrated or nitrosated derivatives	0.0043	0.7564	Chemicals
8537	Boards, panels, consoles, desks, cabinets and other bases, equipped with two or more apparatus of heading 8535 or 8536, for electric control or the distribution of electricity, including those incorporating instruments or apparatus of chapter 90, and numeri	0.0087	0.7495	Electronics
9405	Lamps and lighting fittings including searchlights and spotlights and parts thereof, not elsewhere specified or included; illuminated signs, illuminated nameplates and the like, having a permanently fixed light source, and parts thereof not elsewhere spec	0.1510	0.7483	Textiles
2925	Carboxyimide-function compounds (including saccharin and its salts) and imine-function compounds	0.0102	0.7460	Chemicals
8521	Video recording or reproducing apparatus, whether or not incorporating a video tuner	0.0124	0.7451	Electronics
8707	Bodies (including cabs), for the motor vehicles of headings 8701 to 8705	0.0097	0.7423	Vehicles
7616	Other articles of aluminum	0.0710	0.7401	Metals
4009	Tubes, pipes and hoses, of vulcanized rubber other than hard rubber, with or without their fittings (for example, joints, elbows, flanges)	0.4950	0.7378	Chemicals
4016	Other articles of vulcanized rubber other than hard rubber	0.0439	0.7331	Chemicals
7208	Flat-rolled products of iron or nonalloy steel, of a width of 600 mm or more, hot-rolled, not clad, plated or coated	0.0073	0.7320	Metals
3918	Floor coverings of plastics, whether or not self-adhesive, in rolls or in the form of tiles; wall or ceiling coverings of plastics, as defined in note 9 to this chapter	0.1080	0.7304	Chemicals
3811	Antiknock preparations, oxidation inhibitors, gum inhibitors, viscosity improvers, anti-corrosive preparations and other prepared additives, for mineral oils (including gasoline) or for other liquids used for the same purposes as mineral oils	0.0104	0.7300	Chemicals
3404	Artificial waxes and prepared waxes	0.0102	0.7260	Chemicals
8711	Motorcycles (including mopeds) and cycles fitted with an auxiliary motor, with or without side-cars; side-cars	0.0779	0.7184	Vehicles
8423	Weighing machinery (excluding balances of a sensitivity of 5 cg or better), including weight-operated counting or checking machines; weighing machine weights of all kinds; parts of weighing machinery	0.0204	0.7180	Machinery
7409	Copper plates, sheets and strip, of a thickness exceeding 0.15 mm	0.0123	0.7176	Metals

HS 1992 Code	Product	RCA	PCI	Sectors
8518	Microphones and stands therefor; loudspeakers, whether or not mounted in their enclosures; headphones and earphones, whether or not combined with a microphone, and sets consisting of a microphone and one or more loudspeakers; audio-frequency electric ampli	0.0008	0.7173	Electronics
5602	Felt, whether or not impregnated, coated, covered or laminated	0.3380	0.7152	Textiles
8548	Waste and scrap of primary cells, primary batteries and electric storage batteries; spent primary cells, spent primary batteries and spent electric storage batteries; electrical parts of machinery or apparatus, not specified or included elsewhere in this	0.0016	0.7067	Electronics
8415	Air conditioning machines, comprising a motor-driven fan and elements for changing the temperature and humidity, including those machines in which the humidity cannot be separately regulated; parts thereof	0.0096	0.7050	Machinery
7008	Multiple-walled insulating units of glass	0.0069	0.7005	Stone
8536	Electrical apparatus for switching or protecting electrical circuits, or for making connections to or in electrical circuits (for example, switches, relays, fuses, surge suppressors, plugs, sockets, lamp-holders and other connectors, junction boxes), for	0.0051	0.6962	Electronics
3916	Monofilament of which any cross-sectional dimension exceeds 1 mm, rods, sticks and profile shapes, whether or not surface-worked but not otherwise worked, of plastics	0.0129	0.6928	Chemicals
8311	Wire, rods, tubes, plates, electrodes and similar products of base metal or of metal carbides, coated or cored with flux material, of a kind used for soldering, brazing, welding or deposition of metal or of metal carbides; wire and rods, of agglomerated ba	0.0243	0.6891	Metals
7009	Glass mirrors, whether or not framed, including rear-view mirrors	0.0752	0.6790	Stone
4810	Paper and paperboard, coated on one or both sides with kaolin (China clay) or other inorganic substances, with or without a binder, and with no other coating, whether or not surface-colored, surface-decorated or printed, in rolls or rectangular (including	0.0995	0.6757	Agriculture
8403	Central heating boilers (other than those of heading 8402) and parts thereof	0.0013	0.6752	Machinery
8441	Other machinery for making up paper pulp, paper or paperboard, including cutting machines of all kinds, and parts thereof	0.0363	0.6739	Machinery
9005	Binoculars, monoculars, other optical telescopes, and mountings therefor; other astronomical instruments and mountings therefor, but not including instruments for radio-astronomy; parts and accessories thereof	0.3540	0.6728	Machinery
8535	Electrical apparatus for switching or protecting electrical circuits, or for making connections to or in electrical circuits (for example, switches, fuses, lightning arresters, voltage limiters, surge suppressors, plugs and other connectors, junction boxe	0.0043	0.6688	Electronics

Product Space: Exploring potential for higher exports in Pakistan

HS 1992 Code	Product	RCA	PCI	Sectors
8470	Calculating machines and pocket-size data recording, reproducing and displaying machines with calculating functions; accounting machines, postage-franking machines, ticket-issuing machines and similar machines, incorporating a calculating device; cash registers	0.0056	0.6673	Machinery
5902	Tire cord fabric of high tenacity yarn of nylon or other poly- amides, polyesters or viscose rayon	0.0451	0.6649	Textiles
8516	Electric instantaneous or storage water heaters and immersion heaters; electric space heating apparatus and soil heating apparatus; electrothermic hairdressing apparatus (for example, hair dryers, hair curlers, curling tong heaters) and hand dryers; elect	0.0039	0.6588	Electronics
8418	Refrigerators, freezers and other refrigerating or freezing equipment, electric or other; heat pumps, other than the air conditioning machines of heading 8415; parts thereof	0.0342	0.6579	Machinery
8432	Agricultural, horticultural or forestry machinery for soil preparation or cultivation; lawn or sports ground rollers; parts thereof	0.2780	0.6526	Machinery
3304	Beauty or make-up preparations and preparations for the care of the skin (other than medicaments), including sunscreen or sun tan preparations; manicure or pedicure preparations	0.1130	0.6521	Chemicals
1514	Rapeseed, colza or mustard oil, and fractions thereof, whether or not refined, but not chemically modified	0.3380	0.6518	Agriculture
9020	Other breathing appliances and gas masks, excluding protective masks having neither mechanical parts nor replaceable filters; parts and accessories thereof:	0.0264	0.6490	Machinery
8607	Parts of railway or tramway locomotives or rolling stock	0.0039	0.6488	Vehicles
8409	Parts suitable for use solely or principally with the engines of heading 8407 or 8408	0.0369	0.6469	Machinery
8509	Electromechanical domestic appliances, with self-contained electric motor, other than vacuum cleaners of heading 8508; parts thereof	0.0024	0.6466	Electronics
9207	Musical instruments, the sound of which is produced, or must be amplified, electrically (for example, organs, guitars, accordions)	0.0107	0.6360	Machinery
9025	Hydrometers and similar floating instruments, thermometers, pyrometers, barometers, hygrometers and psychrometers, recording or not, and any combination of these instruments; parts and accessories thereof	0.0468	0.6340	Machinery
3816	Refractory cements, mortars, concretes except graphite	0.0096	0.6296	Chemicals
7007	Safety glass, consisting of toughened (tempered) or laminated glass	0.0022	0.6268	Stone
7411	Copper tubes and pipes	0.0014	0.6221	Metals
9105	Other clocks	0.0466	0.6220	Machinery
3006	Pharmaceutical goods specified in note 4 to this chapter	0.2430	0.6197	Chemicals
3214	Glaziers' putty, grafting putty, resin cements, caulking compounds and other mastics; painters' fillings; nonrefractory surfacing preparations for facades, indoor walls, floors, ceilings or the like	0.0678	0.6155	Chemicals
8450	Household- or laundry-type washing machines, including machines which both wash and dry; parts thereof	0.0348	0.6099	Machinery

HS 1992 Code	Product	RCA	PCI	Sectors
9608	Ball point pens; felt tipped and other porous-tipped pens and markers; fountain pens, stylograph pens and other pens; duplicating styli; propelling or sliding pencils (for example, mechanical pencils); pen-holders, pencil-holders and similar holders; part	0.1080	0.6083	Machinery
6902	Refractory bricks, blocks, tiles and similar refractory ceramic constructional goods, other than those of siliceous fossil meals or similar siliceous earths	0.1740	0.6012	Stone
4809	Carbon paper, self-copy paper and other copying or transfer papers (including coated or impregnated paper for duplicator stencils or offset plates), whether or not printed, in rolls or sheets	0.0175	0.6006	Agriculture
3921	Other plates, sheets, film, foil and strip, of plastics	0.0253	0.5991	Chemicals
8519	Sound recording or reproducing apparatus	0.0006	0.5987	Electronics
9028	Gas, liquid or electricity supply or production meters, including calibrating meters thereof; parts and accessories thereof	0.0873	0.5947	Machinery
8529	Parts suitable for use solely or principally with the apparatus of headings 8525 to 8528	0.0806	0.5913	Electronics
3208	Paints and varnishes (including enamels and lacquers) based on synthetic polymers or chemically modified natural polymers, dispersed or dissolved in a nonaqueous medium; solutions as defined in note 4 to this chapter	0.3030	0.5902	Chemicals
7607	Aluminum foil (whether or not printed, or backed with paper, paperboard, plastics or similar backing materials) of a thickness (excluding any backing) not exceeding 0.2 mm	0.0434	0.5862	Metals
8438	Machinery, not specified or included elsewhere in this chapter, for the industrial preparation or manufacture of food or drink, other than machinery for the extraction or preparation of animal or fixed vegetable fats or oils; parts thereof	0.3640	0.5858	Machinery
9101	Wrist watches, pocket watches and other watches, including stop watches, with case of precious metal or of metal clad with precious metal	0.0013	0.5831	Machinery
5112	Woven fabrics of combed wool or of combed fine animal hair	0.0232	0.5807	Textiles
8704	Motor vehicles for the transport of goods	0.0009	0.5736	Vehicles
9102	Wrist watches, pocket watches and other watches, including stopwatches, other than those of heading 9101	0.0406	0.5718	Machinery
7308	Structures (excluding prefabricated buildings of heading 9406) and parts of structures (for example, bridges and bridge sections, lock gates, towers, lattice masts, roofs, roofing frameworks, doors and windows and their frames and thresholds for doors, sh	0.0156	0.5685	Metals
3904	Polymers of vinyl chloride or of other halogenated olefins, in primary forms	0.6690	0.5667	Chemicals
3926	Other articles of plastics and articles of other materials of headings 3901 to 3914	0.1950	0.5667	Chemicals
3206	Other coloring matter; preparations as specified in note 3 to this chapter, other than those of heading 3203, 3204 or 3205; inorganic products of a kind used as luminophores, whether or not chemically defined	0.0397	0.5633	Chemicals

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HS 1992 Code	Product	RCA	PCI	Sectors
3504	Peptones and their derivatives; other protein substances and their derivatives, not elsewhere specified or included; hide powder, whether or not chromed	0.0261	0.5610	Chemicals
7019	Glass fibers (including glass wool) and articles thereof (for example, yarn, woven fabrics)	0.0065	0.5577	Stone
8442	Machinery, apparatus and equipment (other than the machine tools of headings 8456 to 8465), for preparing or making plates, cylinders or other printing components; plates, cylinders and other printing components; plates, cylinders and lithographic stones,	0.0443	0.5570	Machinery
9306	Bombs, grenades, torpedoes, mines, missiles and similar munitions of war and parts thereof; cartridges and other ammunition and projectiles and parts thereof, including shot and cartridge wads	0.4560	0.5547	Machinery
8527	Reception apparatus for radio broadcasting, whether or not combined, in the same housing, with sound recording or reproducing apparatus or a clock	0.0010	0.5509	Electronics
5404	Synthetic monofilament of 67 decitex or more and of which no cross-sectional dimension exceeds 1 mm; strip and the like (for example, artificial straw) of synthetic textile materials of an apparent width not exceeding 5 mm	0.1050	0.5484	Textiles
5107	Yarn of combed wool, not put up for retail sale	0.0020	0.5467	Textiles
8429	Self-propelled bulldozers, angledozers, graders, levelers, scrapers, mechanical shovels, excavators, shovel loaders, tamping machines and road rollers	0.0103	0.5341	Machinery
5111	Woven fabrics of carded wool or of carded fine animal hair	0.0311	0.5300	Textiles
6702	Artificial flowers, foliage and fruit and parts thereof; articles made of artificial flowers, foliage or fruit	0.0250	0.5269	Textiles
4002	Synthetic rubber and factice derived from oils, in primary forms or in plates, sheets or strip; mixtures of any product of heading 4001 with any product of this heading, in primary forms or in plates, sheets or strip	0.0067	0.5168	Chemicals
2826	Fluorides; fluorosilicates, fluoroaluminates and other complex fluorine salts	0.0037	0.5166	Chemicals
9503	Labeled for use by other persons	0.0397	0.5137	Machinery
3809	Finishing agents, dye carriers to accelerate the dyeing or fixing of dyestuffs and other products and preparations (for example, dressings and mordants), of a kind used in the textile, paper, leather or like industries, not elsewhere specified or included	0.2680	0.5130	Chemicals
404	Whey, whether or not concentrated or containing added sugar or other sweetening matter; products consisting of natural milk constituents, whether or not containing added sugar or other sweetening matter, not elsewhere specified or included	0.0074	0.5055	Agriculture
8474	Machinery for sorting, screening, separating, washing, crushing, grinding, mixing or kneading earth, stone, ores or other mineral substances, in solid (including powder or paste) form; machinery for agglomerating, shaping or molding solid mineral fuels, c	0.0251	0.5032	Machinery
4911	Other printed matter, including printed pictures and photographs	0.0360	0.5022	Agriculture

HS 1992 Code	Product	RCA	PCI	Sectors
9403	Other furniture and parts thereof	0.0501	0.4989	Textiles
8452	Sewing machines, other than book-sewing machines of heading 8440; furniture, bases and covers specially designed for sewing machines; sewing machine needles; parts thereof	0.1530	0.4953	Machinery
7304	Tubes, pipes and hollow profiles, seamless, of iron (other than cast iron) or steel	0.0159	0.4916	Metals
5403	Artificial filament yarn (other than sewing thread), not put up for retail sale, including artificial monofilament of less than 67 decitex	0.5070	0.4872	Textiles
4012	Retreaded or used pneumatic tires of rubber; solid or cushion tires, tire treads and tire flaps, of rubber	0.0437	0.4835	Chemicals
7227	Bars and rods, hot-rolled, in irregularly wound coils, of other alloy steel	0.0001	0.4718	Metals
5504	Artificial staple fibers, not carded, combed or otherwise processed for spinning	0.0020	0.4714	Textiles
3922	Baths, shower baths, sinks, washbasins, bidets, lavatory pans, seats and covers, flushing cisterns and similar sanitary ware, of plastics	0.0559	0.4710	Chemicals
9019	Mechano-therapy appliances; massage apparatus; psychological aptitude-testing apparatus; ozone therapy, oxygen therapy, aerosol therapy, artificial respiration or other therapeutic respiration apparatus; parts and accessories thereof	0.1900	0.4661	Machinery
5801	Woven pile fabrics and chenille fabrics, other than fabrics of heading 5802 or 5806	0.8630	0.4646	Textiles
7907	Other articles of zinc:	0.1430	0.4610	Metals
9607	Slide fasteners and parts thereof	0.1870	0.4578	Machinery
8447	Knitting machines, stitch-bonding machines and machines for making gimped yarn, tulle, lace, embroidery, trimmings, braid or net and machines for tufting	0.0078	0.4572	Machinery
2901	Acyclic hydrocarbons	0.0001	0.4571	Chemicals
7606	Aluminum plates, sheets and strip, of a thickness exceeding 0.2 mm	0.0030	0.4555	Metals
8540	Thermionic, cold cathode or photocathode tubes (for example, vacuum or vapor or gas filled tubes, mercury arc rectifying tubes, cathode-ray tubes, television camera tubes); parts thereof	0.0029	0.4548	Electronics
8108	Titanium and articles thereof, including waste and scrap	0.0214	0.4542	Metals
9023	Instruments, apparatus and models, designed for demonstrational purposes (for example, in education or exhibitions), unsuitable for other uses, and parts and accessories thereof	0.1200	0.4504	Machinery
7324	Sanitary ware and parts thereof, of iron or steel	0.0711	0.4485	Metals
2923	Quaternary ammonium salts and hydroxides; lecithins and other phosphoaminolipids, whether or not chemically defined	0.0009	0.4482	Chemicals
3505	Dextrins and other modified starches (for example, pregelatinized or esterified starches); glues based on starches, or on dextrins or other modified starches	0.9820	0.4452	Chemicals

Product Space: Exploring potential for higher exports in Pakistan

HS 1992 Code	Product	RCA	PCI	Sectors
4014	Hygienic or pharmaceutical articles (including nursing nipples), of vulcanized rubber other than hard rubber, with or without fittings of hard rubber	0.0103	0.4423	Chemicals
6810	Articles of cement, of concrete or of artificial stone, whether or not reinforced	0.0876	0.4413	Stone
8101	Tungsten (wolfram) and articles thereof, including waste and scrap	0.5790	0.4263	Metals
8528	Monitors and projectors, not incorporating television reception apparatus; reception apparatus for television, whether or not incorporating radio-broadcast receivers or sound or video recording or reproducing apparatus	0.0105	0.4247	Electronics
4802	Uncoated paper and paperboard, of a kind used for writing, printing or other graphic purposes, and non perforated punch-cards and punch tape paper, in rolls or rectangular (including square) sheets, of any size, other than paper of heading 4801 or 4803; h	0.0207	0.4199	Agriculture
4901	Printed books, brochures, leaflets and similar printed matter, whether or not in single sheets	0.1430	0.4195	Agriculture
9003	Frames and mountings for spectacles, goggles or the like, and parts thereof	0.0021	0.4186	Machinery
3920	Other plates, sheets, film, foil and strip, of plastics, noncellular and not reinforced, laminated, supported or similarly combined with other materials	0.6020	0.4184	Chemicals
6506	Other headgear, whether or not lined or trimmed	0.6220	0.4168	Textiles
4415	Packing cases, boxes, crates, drums and similar packings, of wood; cable-drums, of wood; pallets, box-pallets and other load boards, of wood; pallet collars of wood	0.0331	0.4140	Agriculture
4814	Wallpaper and similar wallcoverings; window transparencies of paper	0.0427	0.4118	Agriculture
7115	Other articles of precious metal or of metal clad with precious metal	0.3220	0.3969	Stone
7018	Glass beads, imitation pearls, imitation precious or semiprecious stones and similar glass smallwares and articles thereof other than imitation jewelry; glass eyes other than prosthetic articles; statuettes and other ornaments of lamp-worked glass, other	0.1830	0.3947	Stone
7610	Aluminum structures (excluding prefabricated buildings of heading 9406) and parts of structures (for example, bridges and bridge-sections, towers, lattice masts, roofs, roofing frameworks, doors and windows and their frames and thresholds for doors, balus	0.0175	0.3914	Metals
3406	Candles, tapers and the like	0.0084	0.3878	Chemicals
4011	New pneumatic tires, of rubber	0.1510	0.3869	Chemicals
3902	Polymers of propylene or of other olefins, in primary forms	0.0237	0.3864	Chemicals
7325	Other cast articles of iron or steel	0.0832	0.3706	Metals
7224	Other alloy steel in ingots or other primary forms; semi-finished products of other alloy steel	0.0012	0.3694	Metals
2507	Kaolin and other kaolinic clays, whether or not calcined	0.4860	0.3693	Minerals
3305	Preparations for use on the hair	0.4100	0.3670	Chemicals

HS 1992 Code	Product	RCA	PCI	Sectors
8426	Ships' derricks; cranes, including cable cranes; mobile lifting frames, straddle carriers and works trucks fitted with a crane	0.0181	0.3615	Machinery
7228	Other bars and rods of other alloy steel; angles, shapes and sections, of other alloy steel; hollow drill bars and rods, of alloy or non-alloy steel	0.0022	0.3536	Metals
7323	Table, kitchen or other household articles and parts thereof, of iron or steel; iron or steel wool; pot scourers and scouring or polishing pads, gloves and the like, of iron or steel	0.1780	0.3465	Metals
6912	Ceramic tableware, kitchenware, other household articles and toilet articles, other than of porcelain or china:	0.2360	0.3395	Stone
3307	Pre-shave, shaving or after-shave preparations, personal deodorants, bath preparations, depilatories and other perfumery, cosmetic or toilet preparations, not elsewhere specified or included; prepared room deodorizers, whether or not perfumed	0.3670	0.3362	Chemicals
9613	Cigarette lighters and other lighters, whether or not mechanical or electrical, and parts thereof other than flints and wicks	0.0003	0.3279	Machinery
7210	Flat-rolled products of iron or nonalloy steel, of a width of 600 mm or more, clad, plated or coated	0.7240	0.3249	Metals
2815	Sodium hydroxide (Caustic soda); potassium hydroxide (Caustic potash); peroxides of sodium or potassium	0.3230	0.3155	Chemicals
9303	Other firearms and similar devices which operate by the firing of an explosive charge (for example, sporting shot-guns and rifles, muzzle-loading firearms, Very pistols and other devices designed to project only signal flares, pistols and revolvers for fi	0.0018	0.3148	Machinery
4823	Other paper, paperboard, cellulose wadding and webs of cellulose fibers, cut to size or shape; other articles of paper pulp, paper, paperboard, cellulose wadding or webs of cellulose fibers	0.0851	0.3107	Agriculture
8803	Parts of goods of heading 8801 or 8802	0.1570	0.3008	Vehicles
9015	Surveying (including photogrammetrical surveying), hydrographic, oceanographic, hydrological, meteorological or geophysical instruments and appliances, excluding compasses; rangefinders; parts and accessories thereof	0.0380	0.3003	Machinery
6601	Umbrellas and sun umbrellas (including walking-stick umbrellas, garden umbrellas and similar umbrellas)	0.0189	0.2895	Textiles
5503	Synthetic staple fibers, not carded, combed or otherwise processed for spinning	0.8100	0.2799	Textiles
3306	Preparations for oral or dental hygiene, including denture fixative pastes and powders; yarn used to clean between the teeth (dental floss), in individual retail packages	0.0876	0.2776	Chemicals
2821	Iron oxides and hydroxides; earth colors containing 70 percent or more by weight of combined iron evaluated as Fe ₂ O ₃	0.0275	0.2722	Chemicals
9401	Seats (other than those of heading 9402), whether or not convertible into beds, and parts thereof	0.0091	0.2538	Textiles
7309	Tanks etc, over 300 liter capacity, iron or steel	0.0066	0.2525	Metals

Product Space: Exploring potential for higher exports in Pakistan

HS 1992 Code	Product	RCA	PCI	Sectors
7117	Imitation jewelry	0.0676	0.2386	Stone
5501	Synthetic filament tow	0.0650	0.2351	Textiles
1601	Sausages and similar products, of meat, meat offal or blood; food preparations based on these products	0.0028	0.2307	Agriculture
4418	Builders' joinery and carpentry of wood, including cellular wood panels and assembled flooring panels; shingles and shakes	0.0077	0.2272	Agriculture
3303	Perfumes and toilet waters	0.0356	0.2269	Chemicals
9006	Photographic (other than cinematographic) cameras; photographic flashlight apparatus and flashbulbs other than discharge lamps of heading 8539; parts and accessories thereof	0.0007	0.2264	Machinery
4303	Articles of apparel, clothing accessories and other articles of furskin	0.4760	0.2239	Agriculture
7013	Glassware of a kind used for table, kitchen, toilet, office, indoor decoration or similar purposes (other than that of heading 7010 or 7018)	0.4680	0.2238	Stone
9701	Paintings, drawings and pastels, executed entirely by hand, other than drawings of heading 4906 and other than hand-painted or hand-decorated manufactured articles; collages and similar decorative plaques; all therefore going framed or not framed	0.0837	0.2179	Textiles
3925	Builders' ware of plastics, not elsewhere specified or included	0.0101	0.2176	Chemicals
7608	Aluminum tubes and pipes	0.0011	0.2103	Metals
1518	Animal or vegetable fats and oils and their fractions, boiled, oxidized, dehydrated, sulfurized, blown, polymerized by heat in vacuum or in inert gas or otherwise chemically modified, excluding those of heading 1516; inedible mixtures or preparations of a	0.0413	0.2099	Agriculture
3402	Organic surface-active agents (other than soap); surface-active preparations, washing preparations (including auxiliary washing preparations) and cleaning preparations, whether or not containing soap, other than those of heading 3401	0.3640	0.2042	Chemicals
8513	Portable electric lamps designed to function by their own source of energy (for example, dry batteries, storage batteries, magnetos), other than lighting equipment of heading 8512; parts thereof	0.0126	0.2026	Electronics
3501	Casein, caseinates and other casein derivatives; casein glues	0.0084	0.1991	Chemicals
7113	Articles of jewelry and parts thereof, of precious metal or of metal clad with precious metal	0.1870	0.1940	Stone
6813	Friction material and articles thereof (for example, sheets, rolls, strips, segments, discs, washers, pads), not mounted, for brakes, for clutches or the like, with a basis of asbestos, of other mineral substances or of cellulose, whether or not combined	0.0294	0.1919	Stone
2849	Carbides, whether or not chemically defined	0.0006	0.1917	Chemicals
7312	Stranded wire, ropes, cables, plaited bands, slings and the like, of iron or steel, not electrically insulated	0.0227	0.1904	Metals
1806	Chocolate and other food preparations containing cocoa	0.0665	0.1864	Agriculture

HS 1992 Code	Product	RCA	PCI	Sectors
2707	Oils and other products of the distillation of high temperature coal tar; similar products in which the weight of the aromatic constituents exceeds that of the nonaromatic constituents	0.0017	0.1785	Minerals
2106	Food preparations not elsewhere specified or included	0.9900	0.1677	Agriculture
7321	Stoves, ranges, grates, cookers (including those with subsidiary boilers for central heating), barbecues, braziers, gas rings, plate warmers and similar nonelectric domestic appliances, and parts thereof, of iron or steel	0.0673	0.1525	Metals
9406	Prefabricated buildings:	0.0946	0.1497	Textiles
3802	Activated carbon; activated natural mineral products; animal black, including spent animal black	0.1900	0.1490	Chemicals
8309	Stoppers, caps and lids (including crown corks, screw caps and pouring stoppers),capsules for bottles, threaded bungs, bung covers, seals and other packing accessories, and parts thereof, of base metal	0.0089	0.1441	Metals
4808	Paper and paperboard, corrugated (with or without glued flat surface sheets), creped, crinkled, embossed or perforated, in rolls or sheets, other than paper of the kind described in heading 4803	0.4500	0.1414	Agriculture
5402	Synthetic filament yarn (other than sewing thread), not put up for retail sale, including synthetic monofilament of less than 67 decitex	0.9270	0.1411	Textiles
2003	Mushrooms and truffles, prepared or preserved otherwise than by vinegar or acetic acid	0.0758	0.1407	Agriculture
8405	Producer gas or water gas generators, with or without their purifiers; acetylene gas generators and similar water process gas generators, with or without their purifiers; parts thereof	0.1080	0.1391	Machinery
7314	Cloth (including endless bands), grill, netting and fencing, of iron or steel wire; expanded metal of iron or steel	0.0062	0.1334	Metals
4821	Paper and paperboard labels of all kinds, whether or not printed	0.1740	0.1273	Agriculture
1602	Other prepared or preserved meat, meat offal or blood	0.1170	0.1208	Agriculture
3302	Mixtures of odoriferous substances and mixtures (including alcoholic solutions) with a basis of one or more of these substances, of a kind used as raw materials in industry; other preparations based on odoriferous substances, of a kind used for the manufa	0.1110	0.1190	Chemicals
3209	Paints and varnishes (including enamels and lacquers) based on synthetic polymers or chemically modified natural polymers, dispersed or dissolved in an aqueous medium	0.4800	0.1172	Chemicals
2712	Petroleum jelly; paraffin wax, microcrystalline petroleum wax, slack wax, ozokerite, lignite wax, peat wax, other mineral waxes and similar products obtained by synthesis or by other processes, whether or not colored	0.0243	0.1132	Minerals
8802	Other aircraft (for example,helicopters, airplanes); spacecraft (including satellites) and suborbital and spacecraft launch vehicles	0.3260	0.1129	Vehicles

Product Space: Exploring potential for higher exports in Pakistan

HS 1992 Code	Product	RCA	PCI	Sectors
1901	Malt extract; food preparations of flour, groats, meal, starch or malt extract, not containing cocoa or containing less than 40 percent by weight of cocoa calculated on a totally defatted basis, not elsewhere specified or included; food preparations of go	0.4220	0.1127	Agriculture
2807	Sulfuric acid; oleum	0.0361	0.1070	Chemicals
8702	Motor vehicles for the transport of ten or more persons, including the driver	0.0020	0.1050	Vehicles
101	Live horses, asses, mules or hinnies	0.4330	0.1019	Agriculture
3808	Insecticides, rodenticides, fungicides, herbicides, antisprouting products and plant-growth regulators, disinfectants and similar products, put up in forms or packings for retail sale or as preparations or articles (for example, sulfur-treated bands, wick	0.0574	0.0996	Chemicals
3405	Polishes and creams, for footwear, furniture, floors, coachwork, glass or metal, scouring pastes and powders and similar preparations (whether or not in the form of paper, wadding, felt, nonwovens, cellular plastics or cellular rubber, impregnated, coated	0.3560	0.0991	Chemicals
4410	Particle board, oriented strand board (OSB) and similar board (for example, waferboard) of wood or other ligneous materials, whether or not agglomerated with resins or other organic binding substances	0.1140	0.0985	Agriculture
8201	Hand tools of the following kinds and base metal parts thereof spades, shovels, mattocks, picks, hoes, forks and rakes; axes, bill hooks and similar hewing tools; secateurs and pruners of any kind; scythes, sickles, hay knives, hedge shears, timber wedges	0.4920	0.0904	Metals
8712	Bicycles and other cycles (including delivery tricycles), not motorized:	0.0027	0.0895	Vehicles
9606	Buttons, press-fasteners, snap-fasteners and press-studs, button molds and other parts of these articles; button blanks	0.1710	0.0857	Machinery
9113	Watch straps, watch bands and watch bracelets, and parts thereof	0.0046	0.0749	Machinery
8502	Electric generating sets and rotary converters	0.0755	0.0676	Electronics
3901	Polymers of ethylene, in primary forms	0.0569	0.0663	Chemicals
3817	Mixed alkylbenzenes and mixed alkylnaphthalenes, other than those of heading 2707 or 2902	0.0070	0.0648	Chemicals
8402	Steam or other vapor generating boilers (other than central heating hot water boilers capable also of producing low pressure steam); super-heated water boilers; parts thereof	0.5520	0.0644	Machinery
405	Butter and other fats and oils derived from milk; dairy spreads	0.0448	0.0528	Agriculture
8215	Spoons, forks, ladles, skimmers, cake-servers, fish-knives, butter-knives, sugar tongs and similar kitchen or tableware; and base metal parts thereof	0.3970	0.0509	Metals
3923	Articles for the conveyance or packing of goods, of plastics; stoppers, lids, caps and other closures, of plastics	0.1140	0.0431	Chemicals
4813	Cigarette paper, whether or not cut to size or in the form of booklets or tubes	0.0815	0.0319	Agriculture

HS 1992 Code	Product	RCA	PCI	Sectors
4817	Envelopes, letter cards, plain postcards and correspondence cards, of paper or paperboard; boxes, pouches, wallets and writing compendiums, of paper or paperboard, containing an assortment of paper stationery	0.0730	0.0212	Agriculture
7209	Flat-rolled products of iron or nonalloy steel, of a width of 600 mm or more, cold-rolled (cold-reduced), not clad, plated or coated	0.9700	0.0155	Metals
401	Milk and cream, not concentrated nor containing added sugar or other sweetening matter	0.3840	0.0102	Agriculture
2909	Ethers, ether-alcohols, ether-phenols, ether-alcohol-phenols, alcohol peroxides, ether peroxides, ketone peroxides (whether or not chemically defined), and their halogenated, sulfonated, nitrated or nitrosated derivatives	0.0017	0.0028	Chemicals
207	Meat and edible offal, of the poultry of heading 0105, fresh, chilled or frozen	0.0643	-0.0022	Agriculture
2835	Phosphinates (hypophosphites), phosphonates (phosphites) and phosphates; polyphosphates, whether or not chemically defined	0.2240	-0.0048	Chemicals
406	Cheese and curd	0.0014	-0.0080	Agriculture
2303	Residues of starch manufacture and similar residues, beet-pulp, bagasse and other waste of sugar manufacture, brewing or distilling dregs and waste, whether or not in the form of pellets	0.3340	-0.0126	Agriculture
4205	Other articles of leather or of composition leather	0.9470	-0.0132	Agriculture
6807	Articles of asphalt or of similar material (for example, petroleum bitumen or coal tar pitch)	0.0029	-0.0172	Stone
3917	Tubes, pipes and hoses and fittings therefor (for example, joints, elbows, flanges), of plastics	0.0258	-0.0189	Chemicals
8705	Special purpose motor vehicles, other than those principally designed for the transport of persons or goods (for example, wreckers, mobile cranes, fire fighting vehicles, concrete mixers, road sweepers, spraying vehicles, mobile workshops, mobile radiology)	0.3990	-0.0210	Vehicles
4805	Other uncoated paper and paperboard, in rolls or sheets, not further worked or processed than as specified in note 3 to this chapter	0.1980	-0.0251	Agriculture
7004	Drawn glass and blown glass, in sheets, whether or not having an absorbent, reflecting or non-reflecting layer, but not otherwise worked	0.0554	-0.0272	Stone
9603	Brooms, brushes (including brushes constituting parts of machines, appliances or vehicles), hand-operated mechanical floor sweepers, not motorized, mops and feather dusters; prepared knots and tufts for broom or brush making; paint pads and rollers; squeegee	0.4420	-0.0291	Machinery
8478	Machinery for preparing or making up tobacco, not specified or included elsewhere in this chapter; parts thereof	0.6970	-0.0345	Machinery
5806	Narrow woven fabrics, other than goods of heading 5807; narrow fabrics consisting of warp without weft assembled by means of an adhesive (boltducs)	0.6420	-0.0368	Textiles
2811	Other inorganic acids and other inorganic oxygen compounds of nonmetals	0.0445	-0.0506	Chemicals

Product Space: Exploring potential for higher exports in Pakistan

HS 1992 Code	Product	RCA	PCI	Sectors
7215	Other bars and rods of iron or nonalloy steel	0.0089	-0.0597	Metals
6911	Tableware, kitchenware, other household articles and toilet articles, of porcelain or china	0.1060	-0.0720	Stone
5703	Carpets and other textile floor coverings, tufted, whether or not made up	0.2020	-0.0805	Textiles
8437	Machines for cleaning, sorting or grading seed, grain or dried leguminous vegetables, and parts thereof; machinery used in the milling industry or for the working of cereals or dried leguminous vegetables, other than farm type machinery; parts thereof	0.0975	-0.0861	Machinery
7303	Tubes, pipes and hollow profiles, of cast iron	0.0010	-0.0893	Metals
9505	Festive, carnival or other entertainment articles, including magic tricks and practical joke articles; parts and accessories thereof	0.0228	-0.1010	Machinery
3806	Rosin and resin acids, and derivatives thereof; rosin spirit and rosin oils; run gums	0.0007	-0.1087	Chemicals
4804	Uncoated kraft paper and paperboard, in rolls or sheets, other than that of heading 4802 or 4803	0.1590	-0.1135	Agriculture
2105	Ice cream and other edible ice, whether or not containing cocoa	0.0468	-0.1209	Agriculture
3823	Industrial monocarboxylic fatty acids; acid oils from refining; industrial fatty alcohols	0.2170	-0.1235	Chemicals
4818	Toilet paper and similar paper, cellulose wadding or webs of cellulose fibers, of a kind used for household or sanitary purposes, in rolls of a width not exceeding 36 cm, or cut to size or shape; handkerchiefs, cleansing tissues, towels, tablecloths	0.2750	-0.1282	Agriculture
6913	Statuettes and other ornamental ceramic articles	0.1870	-0.1357	Stone
2833	Sulfates; alums; peroxosulfates (persulfates)	0.0077	-0.1369	Chemicals
4015	Articles of apparel and clothing accessories (including gloves, mittens and mitts), for all purposes, of vulcanized rubber other than hard rubber	0.2110	-0.1454	Chemicals
8410	Hydraulic turbines, water wheels and regulators therefor; parts thereof	0.0045	-0.1508	Machinery
1003	Barley	0.0223	-0.1582	Agriculture
1001	Wheat and meslin	0.0003	-0.1749	Agriculture
8544	Insulated(including enameled or anodized) wire, cable (including coaxial cable) and other insulated electric conductors, whether or not fitted with connectors; optical fiber cables, made up of individually sheathed fibers, whether or not assembled with el	0.0159	-0.1871	Electronics
4414	Wooden frames for paintings, photographs, mirrors or similar objects	0.1650	-0.1896	Agriculture
4421	Other articles of wood	0.0583	-0.1946	Agriculture
105	Live poultry of the following kinds Chickens, ducks, geese, turkeys and guineas	0.8460	-0.2014	Agriculture
5401	Sewing thread of man-made filaments, whether or not put up for retail sale	0.6090	-0.2058	Textiles
4707	Recovered (waste and scrap) paper and paperboard	0.0206	-0.2106	Agriculture
8907	Other floating structures (for example, rafts, tanks, cofferdams, landing-stages, buoys and beacons)	0.0259	-0.2141	Vehicles

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HS 1992 Code	Product	RCA	PCI	Sectors
1905	Bread, pastry, cakes, biscuits and other bakers' wares, whether or not containing cocoa; communion wafers, empty capsules of a kind suitable for pharmaceutical use, sealing wafers, rice paper and similar products	0.6470	-0.2240	Agriculture
4909	Printed or illustrated postcards; printed cards bearing personal greetings, messages or announcements, whether or not illustrated, with or without envelopes or trimmings:	0.0078	-0.2251	Agriculture
403	Buttermilk, curdled milk and cream, yogurt, kephir and other fermented or acidified milk and cream, whether or not concentrated or containing added sugar or other sweetening matter or flavored or containing added fruit, nuts or cocoa	0.4420	-0.2294	Agriculture
2827	Chlorides, chloride oxides and chloride hydroxides; bromides and bromide oxides; iodides and iodide oxides	0.4900	-0.2496	Chemicals
7311	Containers for compressed or liquified gas	0.1030	-0.2577	Metals
2841	Salts of oxometallic or peroxometallic acids	0.0004	-0.2613	Chemicals
2519	Natural magnesium carbonate (magnesite); fused magnesia; dead-burned (sintered) magnesia, whether or not containing small quantities of other oxides added before sintering; other magnesium oxide, whether or not pure	0.3760	-0.2734	Minerals
8903	Yachts and other vessels for pleasure or sports; row boats and canoes	0.0059	-0.2773	Vehicles
2517	Pebbles, gravel, broken or crushed stone, of a kind commonly used for concrete aggregates, for road metalling, or for railway or other ballast; shingle and flint, whether or not heat-treated; macadam of slag, dross or similar industrial waste, whether or	0.0901	-0.2841	Minerals
7604	Aluminum bars, rods and profiles	0.0063	-0.2872	Metals
4401	Fuel wood, in logs, in billets, in twigs, in faggots or in similar forms; wood in chips or particles; sawdust and wood waste and scrap, whether or not agglomerated in logs, briquettes, pellets or similar forms	0.0098	-0.3002	Agriculture
2904	Sulfonated, nitrated or nitrosated derivatives of hydrocarbons, whether or not halogenated	0.0913	-0.3030	Chemicals
4202	Trunks, suitcases, vanity cases, attache cases, briefcases, school satchels, spectacle cases, binocular cases, camera cases, musical instrument cases, gun cases, holsters and	0.6260	-0.3143	Agriculture
7901	Unwrought zinc	0.0023	-0.3215	Metals
6809	Articles of plaster or of compositions based on plaster	0.0926	-0.3336	Stone
7408	Copper wire	0.1640	-0.3390	Metals
7216	Angles, shapes and sections of iron or nonalloy steel	0.0059	-0.3527	Metals
7217	Wire of iron or nonalloy steel	0.0271	-0.3635	Metals
6801	Setts, curbstones and flagstones, of natural stone (except slate)	0.4360	-0.3669	Stone
8609	Containers (including containers for the transport of fluids) specially designed and equipped for carriage by one or more modes of transport	0.0131	-0.3719	Vehicles
8306	Bells, gongs and the like, nonelectric, of base metal; statuettes and other ornaments, of base metal; photograph, picture or similar frames, of base metal; mirrors of base metal; and base metal parts thereof	0.1750	-0.3864	Metals

Product Space: Exploring potential for higher exports in Pakistan

HS 1992 Code	Product	RCA	PCI	Sectors
4803	Toilet or facial tissue stock, towel or napkin stock and similar paper of a kind used for household or sanitary purposes, cellulose wadding and webs of cellulose fibers, whether or not creped, crinkled, embossed, perforated, surface-colored, surface decor	0.0980	-0.3915	Agriculture
2203	In containers each holding over 4 liters	0.0010	-0.3937	Agriculture
7317	Nails, tacks, drawing pins, corrugated nails, staples (other than those of heading 8305) and similar articles, of iron or steel, whether or not with heads of other material, but excluding such articles with heads of copper:	0.0036	-0.3971	Metals
2201	Waters, including natural or artificial mineral waters and aerated waters, not containing added sugar or other sweetening matter nor flavored; ice and snow	0.0193	-0.4017	Agriculture
7213	Bars and rods, hot-rolled, in irregularly wound coils, of iron or nonalloy steel	0.1230	-0.4041	Metals
6001	Pile fabrics, including long pile fabrics and terry fabrics, knitted or crocheted	0.7700	-0.4081	Textiles
2825	Hydrazine and hydroxylamine and their inorganic salts; other inorganic bases; other metal oxides, hydroxides and peroxides	0.0139	-0.4180	Chemicals
4302	Tanned or dressed furskins (including heads, tails, paws and other pieces or cuttings), unassembled, or assembled (without the addition of other materials) other than those of heading 4303	0.0487	-0.4276	Agriculture
2102	Yeasts (active or inactive); other single-cell microorganisms, dead (but not including vaccines of heading 3002); prepared baking powders	0.0138	-0.4300	Agriculture
1904	Prepared foods obtained by the swelling or roasting of cereals or cereal products (for example, cornflakes); cereals (other than corn (maize)) in grain form or in the form of flakes or other worked grains (except flour, groats and meal)	0.1350	-0.4398	Agriculture
7206	Iron and nonalloy steel in ingots or other primary forms (excluding iron of heading 7203)	0.0296	-0.4488	Metals
7413	Stranded wire, cables, plaited bands and the like, including slings and similar articles, of copper, not electrically insulated:	0.0530	-0.4523	Metals
6404	Footwear with outer soles of rubber, plastics, leather or composition leather and uppers of textile materials	0.0964	-0.4640	Textiles
8001	Unwrought tin	0.0079	-0.4694	Metals
9507	Fishing rods, fish hooks and other line fishing tackle; fish landing nets, butterfly nets and similar nets; decoy birds (other than those of heading 9208 or 9705) and similar hunting or shooting equipment; parts and accessories thereof	0.1130	-0.4749	Machinery
9703	Original sculptures and statuary, in any material	0.0684	-0.4758	Textiles
4819	Cartons, boxes, cases, bags and other packing containers, of paper, paperboard, cellulose wadding or webs of cellulose fibers; box files, letter trays and similar articles, of paper or paperboard of a kind used in offices, shops or the like	0.1920	-0.4764	Agriculture

Policy Challenges for Macroeconomic Management and Growth in Pakistan

HS 1992 Code	Product	RCA	PCI	Sectors
2202	Waters, including mineral waters and aerated waters, containing added sugar or other sweetening matter or flavored, and other nonalcoholic beverages, not including fruit or vegetable juices of heading 2009	0.2100	-0.5044	Agriculture
705	Lettuce (<i>Lactuca sativa</i>) and chicory (<i>Cichorium</i> spp.), fresh or chilled	0.0066	-0.5184	Agriculture
2905	Acyclic alcohols and their halogenated, sulfonated, nitrated or nitrosated derivatives	0.0198	-0.5214	Chemicals
2103	Sauces and preparations therefor; mixed condiments and mixed seasonings; mustard flour and meal and prepared mustard	0.6300	-0.5305	Agriculture
2208	Undenatured ethyl alcohol of an alcoholic strength by volume of less than 80 percent vol.; spirits, liqueurs and other spirituous beverages	0.0001	-0.5407	Agriculture
2844	Radioactive chemical elements and radioactive isotopes (including the fissile or fertile chemical elements and isotopes) and their compounds; mixtures and residues containing these products	0.0001	-0.5475	Chemicals
2101	Extracts, essences and concentrates, of coffee, tea or mate and preparations with a basis of these products or with a basis of coffee, tea or mate; roasted chicory and other roasted coffee substitutes, and extracts, essences and concentrates	0.0471	-0.5526	Agriculture
206	Edible offal of bovine animals, swine, sheep, goats, horses, asses, mules or hinnies, fresh, chilled or frozen	0.7900	-0.5529	Agriculture
808	Apples, pears and quinces, fresh	0.0179	-0.5549	Agriculture
2309	Preparations of a kind used in animal feeding	0.0699	-0.5559	Agriculture
4820	Registers, account books, notebooks, order books, receipt books, letter pads, memorandum pads, diaries and similar articles, exercise books, blotting pads, binders (looseleaf or other), folders, file covers, manifold business forms, interleaved carbon set	0.0467	-0.5623	Agriculture
3924	Tableware, kitchenware, other household articles and hygienic or toilet articles, of plastics	0.5640	-0.5735	Chemicals
2809	Diphosphorus pentoxide; phosphoric acid; polyphosphoric acids, whether or not chemically defined	0.0030	-0.5867	Chemicals
5607	Twine, cordage, ropes and cables, whether or not plaited or braided and whether or not impregnated, coated, covered or sheathed with rubber or plastics	0.6140	-0.5998	Textiles
7010	Carboys, bottles, flasks, jars, pots, vials, ampoules and other containers, of glass, of a kind used for the conveyance or packing of goods; preserving jars of glass; stoppers, lids and other closures, of glass	0.4460	-0.6031	Stone
5105	Wool and fine or coarse animal hair, carded or combed (including combed wool in fragments)	0.1580	-0.6049	Textiles
2104	Soups and broths and preparations therefor; homogenized composite food preparations	0.1220	-0.6064	Agriculture
1502	Bovine, sheep and goat fats, raw or rendered	0.0004	-0.6186	Agriculture
7204	Ferrous waste and scrap; remelting scrap ingots of iron or steel	0.2910	-0.6233	Metals
1805	Cocoa powder, not containing added sugar or other sweetening matter	0.0313	-0.6243	Agriculture

Product Space: Exploring potential for higher exports in Pakistan

HS 1992 Code	Product	RCA	PCI	Sectors
8430	Other moving, grading, leveling, scraping, excavating, tamping, compacting, extracting or boring machinery, for earth, minerals or ores; pile-drivers and pile-extractors; snowplows and snowblowers	0.0582	-0.6290	Machinery
7106	Silver (including silver plated with gold or platinum), unwrought or in semimanufactured forms, or in powder form	0.0036	-0.6345	Stone
7614	Stranded wire, cables, plaited bands and the like, including slings and similar articles, of aluminum, not electrically insulated	0.0033	-0.6360	Metals
3915	Waste, parings and scrap, of plastics	0.9250	-0.6378	Chemicals
2613	Molybdenum ores and concentrates	0.0034	-0.6487	Minerals
2508	Other clays (not including expanded clays of heading 6806), andalusite, kyanite and sillimanite, whether or not calcined; mullite; chamotte or dinas earths	0.7050	-0.6495	Minerals
7207	Semifinished products of iron or nonalloy steel	0.0021	-0.6522	Metals
7112	Waste and scrap of precious metal or of metal clad with precious metal; other waste and scrap containing precious metal or precious metal compounds, of a kind used principally for the recovery of precious metal	0.3210	-0.6584	Stone
811	Fruit and nuts, uncooked or cooked by steaming or boiling in water, frozen, whether or not containing added sugar or other sweetening matter	0.0167	-0.6622	Agriculture
402	Milk and cream, concentrated or containing added sugar or other sweetening matter	0.0292	-0.6648	Agriculture
5705	Other carpets and other textile floor coverings, whether or not made up:	0.7710	-0.7018	Textiles
4412	Plywood, veneered panels and similar laminated wood	0.0589	-0.7283	Agriculture
6406	Parts of footwear (including uppers whether or not attached to soles other than outer soles); removable insoles, heel cushions and similar articles; gaiters, leggings and similar articles, and parts thereof	0.9520	-0.7497	Textiles
710	Vegetables (uncooked or cooked by steaming or boiling in water), frozen	0.2580	-0.7522	Agriculture
706	Carrots, turnips, salad beets (salad beetroot), salsify, celeriac, radishes and similar edible roots, fresh or chilled	0.3650	-0.7708	Agriculture
2005	Other vegetables prepared or preserved otherwise than by vinegar or acetic acid, not frozen, other than products of heading 2006	0.4320	-0.7752	Agriculture
511	Animal products not elsewhere specified or included; dead animals of chapter 1 or 3, unfit for human consumption	0.1210	-0.7878	Agriculture
7602	Waste or scrap, aluminium	0.1350	-0.8060	Metals
102	Live bovine animals	0.0212	-0.8063	Agriculture
2714	Bitumen and asphalt, natural; bituminous or oil shale and tar sands; asphaltites and asphaltic rocks	0.0536	-0.8196	Minerals
4907	Unused postage, revenue or similar stamps of current or new issue in the country in which they have, or will have, a recognized face value; stamp-impressed paper; banknotes; check forms; stock, share or bond certificates and similar documents of title	0.2190	-0.8277	Agriculture

HS 1992 Code	Product	RCA	PCI	Sectors
4408	Sheets for veneering (including those obtained by slicing laminated wood), for plywood or for similar laminated wood and other wood, sawn lengthwise, sliced or peeled, whether or not planed, sanded, spliced or end-jointed, of a thickness not exceeding 6 m	0.0006	-0.8278	Agriculture
6910	Ceramic sinks, washbasins, washbasin pedestals, baths, bidets, water closet bowls, flush tanks, urinals and similar sanitary fixtures	0.0652	-0.8295	Stone
301	Live fish	0.0767	-0.8307	Agriculture
1509	Olive oil and its fractions, whether or not refined, but not chemically modified	0.0044	-0.8360	Agriculture
602	Other live plants (including their roots), cuttings and slips; mushroom spawn	0.0394	-0.8604	Agriculture
4420	Wood marquetry and inlaid wood; caskets and cases for jewelry or cutlery and similar articles, of wood; statuettes and other ornaments, of wood; wooden articles of furniture not falling within chapter 94	0.1970	-0.8607	Agriculture
2713	Petroleum coke, petroleum bitumen and other residues of petroleum oils or of oils obtained from bituminous minerals	0.2500	-0.8747	Minerals
4409	Wood (including strips and friezes for parquet flooring, not assembled) continuously shaped (tongued, grooved, re-bated, chamfered, V-jointed, beaded, molded, rounded or the like) along any of its edges, ends or faces, whether or not planed, sanded or en	0.0144	-0.8793	Agriculture
1104	Cereal grains otherwise worked (for example, hulled, rolled, flaked, pearled, sliced or kibbled), except rice of heading 1006; germ of cereals, whole, rolled, flaked or ground	0.8230	-0.8950	Agriculture
604	Foliage, branches and other parts of plants, without flowers or flower buds, and grasses, mosses and lichens, being goods of a kind suitable for bouquets or for ornamental purposes, fresh, dried, dyed, bleached, impregnated or otherwise prepared	0.1080	-0.9019	Agriculture
1209	Seeds, fruits and spores of a kind used for sowing	0.1850	-0.9241	Agriculture
6802	Worked monumental or building stone (except slate) and articles thereof, other than goods of heading 6801; mosaic cubes and the like, of natural stone (including slate), whether or not on a backing; artificially colored granules, chippings and powder, of	0.9940	-0.9304	Stone
6907	Unglazed ceramic flags and paving, hearth or wall tiles; unglazed ceramic mosaic cubes and the like, whether or not on a backing	0.0042	-0.9309	Stone
3105	Mineral or chemical fertilizers containing two or three of the fertilizing elements nitrogen, phosphorus and potassium; other fertilizers; goods of this chapter in tablets or similar forms or in packages of a gross weight not exceeding 10 kg	0.0007	-0.9404	Chemicals
1517	Margarine; edible mixtures or preparations of animal or vegetable fats or oils or of fractions of different fats or oils of this chapter, other than edible fats or oils or their fractions of heading 1516	0.0700	-0.9463	Agriculture

Product Space: Exploring potential for higher exports in Pakistan

HS 1992 Code	Product	RCA	PCI	Sectors
707	Cucumbers, including gherkins, fresh or chilled	0.0984	-0.9463	Agriculture
7404	Copper waste and scrap:	0.8130	-0.9498	Metals
2402	Cigars, cheroots, cigarillos and cigarettes, of tobacco or of tobacco substitutes	0.4530	-0.9779	Agriculture
6206	Women's or girls' blouses, shirts and shirt-blouses	0.9640	-1.0024	Textiles
6505	Hats and other headgear, knitted or crocheted, or made up from lace, felt or other textile fabric, in the piece (but not in strips), whether or not lined or trimmed; hair-nets of any material, whether or not lined or trimmed	0.5290	-1.0214	Textiles
1519	Stearic acid	0.0163	-1.0612	Agriculture
1902	Pasta, whether or not cooked or stuffed (with meat or other substances) or otherwise prepared, such as spaghetti, macaroni, noodles, lasagna, gnocchi, ravioli, cannelloni; couscous, whether or not prepared	0.8440	-1.0616	Agriculture
2818	Artificial corundum, whether or not chemically defined; aluminum oxide; aluminum hydroxide	0.0011	-1.0795	Chemicals
2530	Mineral substances not elsewhere specified or included	0.1090	-1.1056	Minerals
2510	Natural calcium phosphates, natural aluminum calcium phosphates and phosphatic chalk	0.2250	-1.1156	Minerals
7214	Other bars and rods of iron or nonalloy steel, not further worked than forged, hot-rolled, hot-drawn or hot-extruded, but including those twisted after rolling	0.0109	-1.1263	Metals
6402	Other footwear with outer soles and uppers of rubber or plastics	0.1760	-1.1302	Textiles
8904	Tugs and pusher craft	0.5930	-1.1391	Vehicles
809	Apricots, cherries, peaches (including nectarines), plums (including prune plums) and sloes, fresh	0.0253	-1.1725	Agriculture
202	Meat of bovine animals, frozen	0.1470	-1.1869	Agriculture
2008	Fruit, nuts and other edible parts of plants, otherwise prepared or preserved, whether or not containing added sugar or other sweetening matter or spirit, not elsewhere specified or included	0.2430	-1.1973	Agriculture
1507	Soybean oil and its fractions, whether or not refined, but not chemically modified	0.0593	-1.2121	Agriculture
806	Grapes, fresh or dried	0.0531	-1.2149	Agriculture
709	Other vegetables, fresh or chilled	0.8450	-1.2158	Agriculture
6212	Brassieres, girdles, corsets, braces, suspenders, garters and similar articles and parts thereof, whether or not knitted or crocheted	0.2230	-1.2176	Textiles
702	Tomatoes, fresh or chilled	0.5850	-1.2424	Agriculture
3301	Essential oils (terpeneless or not), including concretes and absolutes; resinoids; extracted oleoresins; concentrates of essential oils in fats, in fixed oils, in waxes or the like, obtained by enfleurage or maceration; terpenic by-products of the deterpe	0.3910	-1.2976	Chemicals
4407	Wood sawn or chipped lengthwise, sliced or peeled, whether or not planed, sanded or end-jointed, of a thickness exceeding 6 mm	0.0025	-1.3105	Agriculture
2814	Ammonia, anhydrous or in aqueous solution	0.0546	-1.3123	Chemicals

HS 1992 Code	Product	RCA	PCI	Sectors
4102	Raw skins of sheep or lambs (fresh, or salted, dried, limed, pickled or otherwise preserved, but not tanned, parchment-dressed or further prepared), whether or not with wool on or split, other than those excluded by note 1(c) to this chapter	0.0100	-1.3487	Agriculture
2304	Oilcake and other solid residues, whether or not ground or in the form of pellets, resulting from the extraction of soybean oil	0.3940	-1.3501	Agriculture
2520	Gypsum; anhydrite; plasters (consisting of calcined gypsum or calcium sulfate) whether or not colored, with or without small quantities of accelerators or retarders	0.2410	-1.3622	Minerals
1101	Wheat or meslin flour	0.0585	-1.3768	Agriculture
2002	Tomatoes prepared or preserved otherwise than by vinegar or acetic acid	0.1000	-1.3854	Agriculture
7202	Ferroalloys	0.0037	-1.4012	Metals
302	Fish, fresh or chilled, excluding fish fillets and other fish meat of heading 0304	0.9680	-1.4174	Agriculture
1804	Cocoa butter, fat and oil	0.0001	-1.4210	Agriculture
2516	Granite, porphyry, basalt, sandstone and other monumental or building stone, whether or not roughly trimmed or merely cut, by sawing or otherwise, into blocks or slabs of a rectangular (including square) shape	0.2510	-1.4266	Minerals
1604	Prepared or preserved fish; caviar and caviar substitutes prepared from fish eggs	0.0229	-1.4652	Agriculture
304	Fish fillets and other fish meat (whether or not minced), fresh, chilled or frozen	0.8100	-1.4721	Agriculture
810	Other fruit, fresh	0.1340	-1.4824	Agriculture
2715	Bituminous mixtures based on natural asphalt, on natural bitumen, on petroleum bitumen, on mineral tar or on mineral tar pitch (for example, bituminous mastics, cut-backs)	0.0001	-1.4929	Minerals
4602	Basketwork, wickerwork and other articles, made directly to shape from plaiting materials or made up from articles of heading 4601; articles of loofah	0.3070	-1.5053	Agriculture
1515	Other fixed vegetable fats and oils (including jojoba oil) and their fractions, whether or not refined, but not chemically modified	0.1650	-1.5121	Agriculture
7102	Diamonds, whether or not worked, but not mounted or set	0.0001	-1.5367	Stone
4101	Raw hides and skins of bovine (including buffalo) or equine animals (fresh, or salted, dried, limed, pickled or otherwise preserved, but not tanned, parchment-dressed or further prepared), whether or not dehaired or split	0.0054	-1.5410	Agriculture
7103	Precious stones (other than diamonds) and semi-precious stones, whether or not worked or graded but not strung, mounted or set; ungraded precious stones (other than diamonds) and semi-precious stones, temporarily strung for convenience of transport	0.7520	-1.5514	Stone
305	Fish, dried, salted or in brine; smoked fish, whether or not cooked before or during the smoking process; flours, meals and pellets of fish, fit for human consumption	0.4910	-1.5658	Agriculture

Product Space: Exploring potential for higher exports in Pakistan

HS 1992 Code	Product	RCA	PCI	Sectors
603	Cut flowers and flower buds of a kind suitable for bouquets or for ornamental purposes, fresh, dried, dyed, bleached, impregnated or otherwise prepared	0.0989	-1.5782	Agriculture
8105	Cobalt mattes and other intermediate products of cobalt metallurgy; cobalt and articles thereof, including waste and scrap	0.0138	-1.6166	Metals
4403	Wood in the rough, whether or not stripped of bark or sap-wood, or roughly squared	0.0001	-1.6176	Agriculture
1208	Flours and meals of oil seeds or oleaginous fruits, other than those of mustard	0.0844	-1.6253	Agriculture
104	Live sheep and goats	0.0957	-1.6818	Agriculture
1201	Soya beans	0.0011	-1.7032	Agriculture
1212	Locust beans, seaweeds and other algae, sugar beet and sugar cane, fresh, chilled, frozen or dried, whether or not ground; fruit stones and kernels and other vegetable products (including unroasted chicory roots of the variety <i>Cichorium intybus sativum</i>)	0.7400	-1.7188	Agriculture
807	Melons (including watermelons) and papayas (papaws), fresh	0.2220	-1.7456	Agriculture
901	Coffee, whether or not roasted or decaffeinated; coffee husks and skins; coffee substitutes containing coffee in any proportion	0.0024	-1.7596	Agriculture
1701	Cane or beet sugar and chemically pure sucrose, in solid form	0.2120	-1.7873	Agriculture
904	Pepper of the genus <i>Piper</i> ; dried or crushed or ground fruits of the genus <i>Capsicum</i> (peppers) or of the genus <i>Pimenta</i> (e.g., allspice)	0.8100	-1.8275	Agriculture
1504	Fats and oils and their fractions, of fish or marine mammals, whether or not refined, but not chemically modified	0.1560	-1.8921	Agriculture
803	Bananas and plantains, fresh or dried	0.5850	-1.9207	Agriculture
2601	Iron ores and concentrates, including roasted iron pyrites	0.1250	-1.9726	Minerals
2616	Precious metal ores and concentrates	0.0251	-1.9860	Minerals
708	Leguminous vegetables, shelled or unshelled, fresh or chilled	0.4650	-2.0196	Agriculture
1513	Coconut (copra), palm kernel or babassu oil, and fractions thereof, whether or not refined, but not chemically modified	0.0183	-2.0594	Agriculture
713	Dried leguminous vegetables, shelled, whether or not skinned or split	0.2750	-2.0902	Agriculture
4001	Natural rubber, balata, gutta-percha, guayule, chicle and similar natural gums, in primary forms or in plates, sheets or strip	0.0264	-2.1209	Chemicals
714	Cassava (manioc), arrowroot, salep, Jerusalem artichokes, sweet potatoes and similar roots and tubers with high starch or inulin content, fresh, chilled, frozen or dried, whether or not sliced or in the form of pellets; sago pith	0.0554	-2.1594	Agriculture
6704	Wigs, false beards, eyebrows and eyelashes, switches and the like, of human or animal hair or of textile materials; articles of human hair not elsewhere specified or included	0.0296	-2.1639	Textiles
1202	Peanuts (ground-nuts), not roasted or otherwise cooked, whether or not shelled or broken	0.0414	-2.1802	Agriculture

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HS 1992 Code	Product	RCA	PCI	Sectors
2603	Copper content	0.0880	-2.1865	Minerals
5101	Wool, not carded or combed	0.1050	-2.2039	Textiles
1511	Palm oil and its fractions, whether or not refined, but not chemically modified	0.0108	-2.3285	Agriculture
801	Coconuts, Brazil nuts and cashew nuts, fresh or dried, whether or not shelled or peeled	0.0160	-2.3953	Agriculture
2709	Petroleum oils and oils obtained from bituminous minerals, crude	0.1020	-2.4002	Minerals
5201	Cotton, not carded or combed:	0.5290	-2.4320	Textiles
7108	Gold (including gold plated with platinum) unwrought or in semimanufactured forms, or in powder form	0.0146	-2.5220	Stone
2606	Aluminium ores and concentrates	0.0274	-2.5354	Minerals
2602	Containing 47 percent or more by weight of manganese	0.0219	-2.9283	Minerals

Appendix C:

Scenario 3: The Primary Connections with the goods exported by Pakistan in 2021 which have RCA greater than one

HS 1992 Code	Product	RCA	PCI	Sectors
6302	Bed linen, table linen, toilet linen and kitchen linen	122.0000	-1.2312	Textiles
5209	Woven fabrics of cotton, containing 85 percent or more by weight of cotton, weighing more than 200 g/m2	91.6000	-1.1748	Textiles
4106	Tanned or crust skins of other animals, without wool or hair on, whether or not split, but not further prepared	81.0000	-1.8952	Agriculture
5210	Woven fabrics of cotton, containing less than 85 percent by weight of cotton, mixed mainly or solely with man-made fibers, weighing not more than 200 g/m2	78.3000	-0.8482	Textiles
5513	Woven fabrics of synthetic staple fibers, containing less than 85 percent by weight of such fibers, mixed mainly or solely with cotton, of a weight not exceeding 170 g/m2	62.3000	-1.6326	Textiles
5701	Carpets and other textile floor coverings, knotted, whether or not made up	57.8000	-1.0486	Textiles
4203	Articles of apparel and clothing accessories, of leather or of composition leather	57.1000	-0.8680	Agriculture
1006	Rice	48.8000	-1.5575	Agriculture
5205	Cotton yarn (other than sewing thread), containing 85 percent or more by weight of cotton, not put up for retail sale	48.4000	-1.8582	Textiles
5208	Woven fabrics of cotton, containing 85 percent or more by weight of cotton, weighing not more than 200 g/m2	40.9000	-0.8849	Textiles
6203	Men's or boys' suits, ensembles, suit-type jackets, blazers, trousers, bib and brace overalls, breeches and shorts (other than swimwear)	34.7000	-1.2747	Textiles
6207	Men's or boys' singlets and other undershirts, underpants, briefs, nightshirts, pajamas, bathrobes, dressing gowns and similar articles	33.5000	-1.4255	Textiles
5514	Woven fabrics of synthetic staple fibers, containing less than 85 percent by weight of such fibers, mixed mainly or solely with cotton, of a weight exceeding 170 g/m2	32.6000	-0.9070	Textiles
6116	Gloves, mittens and mitts, knitted or crocheted	32.6000	-0.8300	Textiles
5211	Woven fabrics of cotton, containing less than 85 percent by weight of cotton, mixed mainly or solely with man-made fibers, weighing more than 200 g/m2	31.9000	-0.3974	Textiles
6105	Men's or boys' shirts, knitted or crocheted	30.2000	-1.5336	Textiles
6309	Used clothes and textiles	29.0000	-0.3748	Textiles
6103	Men's or boys' suits, ensembles, suit-type jackets, blazers, trousers, bib and brace overalls, breeches and shorts (other than swimwear), knitted or crocheted	27.7000	-1.3519	Textiles

HS 1992 Code	Product	RCA	PCI	Sectors
6115	Panty hose, tights, stockings, socks and other hosiery, including graduated compression hosiery (for example, stockings for varicose veins) and footwear without applied soles, knitted or crocheted	26.0000	-0.9402	Textiles
1207	Other oil seeds and oleaginous fruits, whether or not broken	24.4000	-2.2625	Agriculture
2207	Undenatured ethyl alcohol of an alcoholic strength by volume of 80 percent vol. or higher; ethyl alcohol and other spirits, denatured, of any strength	24.2000	-0.7587	Agriculture
6101	Men's or boys' overcoats, carcoats, capes, cloaks, anoraks (including ski-jackets), windbreakers and similar articles, knitted or crocheted, other than those of heading 6103	20.9000	-1.2231	Textiles
813	Fruit, dried, other than that of headings 0801 to 0806; mixtures of nuts or dried fruits of this chapter	18.0000	-0.9918	Agriculture
701	Potatoes, fresh or chilled	17.4000	-0.7616	Agriculture
910	Ginger, saffron, turmeric (curcuma), thyme, bay leaves, curry and other spices	15.8000	-1.5562	Agriculture
7203	Ferrous products obtained by direct reduction of iron ore and other spongy ferrous products, in lumps, pellets or similar forms; iron having a minimum purity by weight of 99.94 percent, in lumps, pellets or similar forms	14.8000	-1.3203	Metals
6107	Men's or boys' underpants, briefs, nightshirts, pajamas, bathrobes, dressing gowns and similar articles, knitted or crocheted	14.2000	-1.5246	Textiles
5512	Woven fabrics of synthetic staple fibers, containing 85 percent or more by weight of synthetic staple fibers	13.0000	0.1794	Textiles
6303	Curtains (including drapes) and interior blinds; curtain or bed valances	13.0000	-0.2721	Textiles
2523	Portland cement, aluminous cement, slag cement, supersulfate cement and similar hydraulic cements, whether or not colored or in the form of clinkers	12.9000	-1.3372	Minerals
2501	Salt (including table salt and denatured salt) and pure sodium chloride, whether or not in aqueous solution or containing added anticaking or free-flowing agents; sea water	12.5000	-1.0635	Minerals
4105	Tanned or crust skins of sheep or lambs, without wool on, whether or not split, but not further prepared	12.3000	-1.9635	Agriculture
703	Onions, shallots, garlic, leeks and other alliaceous vegetables, fresh or chilled	12.1000	-1.9803	Agriculture
6208	Women's or girls' singlets and other undershirts, slips, petticoats, briefs, panties, nightdresses, pajamas, negligees, bathrobes, dressing gowns and similar articles	11.5000	-1.2983	Textiles
6110	Sweaters, pullovers, sweatshirts, waistcoats (vests) and similar articles, knitted or crocheted	11.4000	-1.3956	Textiles
7402	Unrefined copper; copper anodes for electrolytic refining	10.4000	-2.5151	Metals
6307	Other made up articles, including dress patterns	9.8800	-0.9417	Textiles
1103	Cereal groats, meal and pellets	9.7200	-1.0171	Agriculture

Product Space: Exploring potential for higher exports in Pakistan

HS 1992 Code	Product	RCA	PCI	Sectors
1516	Animal or vegetable fats and oils and their fractions, partly or wholly hydrogenated, inter-esterified, re-esterified or elaidinized, whether or not refined, but not further prepared	9.5100	-1.4096	Agriculture
6204	Women's or girls' suits, ensembles, suit-type jackets, blazers, dresses, skirts, divided skirts, trousers, bib and brace overalls, breeches and shorts (other than swimwear)	9.4600	-1.3247	Textiles
6304	Other furnishing articles, excluding those of heading 9404	9.4200	-1.0066	Textiles
6306	Tarpaulins, awnings and sunblinds; tents; sails for boats, sailboards or landcraft; camping goods	8.9000	-0.8999	Textiles
2529	Feldspar; leucite, nepheline and nepheline syenite; fluorspar	8.2400	-1.4514	Minerals
6109	T-shirts, singlets, tank tops and similar garments, knitted or crocheted	7.8900	-1.2803	Textiles
2515	Marble, travertine and other calcareous monumental or building stone of an apparent specific gravity of 2.5 or more, and alabaster, whether or not roughly trimmed or merely cut, by sawing or otherwise, into blocks or slabs of a rectangular	7.7800	-1.3264	Minerals
805	Citrus fruit, fresh or dried	7.5600	-1.2924	Agriculture
6102	Women's or girls' overcoats, carcoats, capes, cloaks, anoraks (including ski-jackets), windbreakers and similar articles, knitted or crocheted, other than those of heading 6104	7.5400	-1.0303	Textiles
804	Dates, figs, pineapples, avocados, guavas, mangoes and mangosteens, fresh or dried	7.3600	-1.8130	Agriculture
4107	Leather further prepared after tanning or crusting, including parchment-dressed leather, of bovine (including buffalo) or equine animals, without hair on, whether or not split, other than leather of heading 4114	7.3100	-0.9198	Agriculture
6106	Women's or girls' blouses and shirts, knitted or crocheted	7.3000	-1.2425	Textiles
6301	Blankets and traveling rugs	7.0200	-1.0393	Textiles
307	Molluscs, whether in shell or not, live, fresh, chilled, frozen, dried, salted or in brine; aquatic invertebrates other than crustaceans and molluscs, live, fresh, chilled, frozen, dried, salted or in brine; flours, meals and pellets of aquatic invertebra	6.9500	-1.6603	Agriculture
6112	Track suits, ski-suits and swimwear, knitted or crocheted	6.9400	-0.7843	Textiles
6104	Women's or girls' suits, ensembles, suit-type jackets, blazers, dresses, skirts, divided skirts, trousers, bib and brace overalls, breeches and shorts (other than swimwear), knitted or crocheted	6.9300	-1.3329	Textiles
6111	Babies' garments and clothing accessories, knitted or crocheted	6.8300	-1.5907	Textiles

HS 1992 Code	Product	RCA	PCI	Sectors
9404	Mattress supports; articles of bedding and similar furnishing (for example, mattresses, quilts, eiderdowns, cushions, pouffes and pillows) fitted with springs or stuffed or internally fitted with any material or of cellular rubber or plastics, whether or no	6.6300	-0.4773	Textiles
6211	Track suits, ski-suits and swimwear; other garments	6.5500	-1.1209	Textiles
201	Meat of bovine animals, fresh or chilled	6.1600	-0.5626	Agriculture
4013	Inner tubes, of rubber	5.6100	-0.4614	Chemicals
4104	Tanned or crust hides and skins of bovine (including buffalo) or equine animals, without hair on, whether or not split, but not further prepared	5.4200	-1.2169	Agriculture
6117	Other made up clothing accessories, knitted or crocheted; knitted or crocheted parts of garments or of clothing accessories	5.1100	-1.0619	Textiles
1702	Other sugars, including chemically pure lactose, maltose, glucose and fructose, in solid form; sugar syrups not containing added flavoring or coloring matter; artificial honey, whether or not mixed with natural honey; caramel	4.7700	-0.1064	Agriculture
7403	Refined copper and copper alloys, unwrought (other than master alloys of heading 7405)	4.7300	-1.5180	Metals
8203	Files, rasps, pliers (including cutting pliers), pincers, tweezers, metal cutting shears, pipe cutters, bolt cutters, perforating punches and similar hand tools, and base metal parts thereof	4.4400	0.7937	Metals
9506	Articles and equipment for general physical exercise, gymnastics, athletics, other sports (including table-tennis) or outdoor games, not specified or included elsewhere in this chapter; swimming pools and wading pools; parts and accessories thereof	4.4400	0.4466	Machinery
6209	Babies' garments and clothing accessories	4.2700	-1.5209	Textiles
6305	Sacks and bags, of a kind used for the packing of goods	4.0000	-1.8375	Textiles
5509	Yarn (other than sewing thread) of synthetic staple fibers, not put up for retail sale	3.8500	-0.4513	Textiles
1704	Sugar confectionery (including white chocolate), not containing cocoa	3.7900	-0.5826	Agriculture
2608	Zinc ores and concentrates	3.7800	-1.5280	Minerals
5516	Woven fabrics of artificial staple fibers	3.7700	-0.0054	Textiles
504	Guts, bladders and stomachs of animals except fish	3.7300	-1.0502	Agriculture
5807	Labels, badges and similar articles of textile materials, in the piece, in strips or cut to shape or size, not embroidered	3.7200	-0.4850	Textiles
3814	Organic composite solvents and thinners, not elsewhere specified or included; prepared paint or varnish removers	3.6300	0.0396	Chemicals
6114	Other garments, knitted or crocheted	3.5100	-1.3249	Textiles
6405	Other footwear	3.5100	-0.9790	Textiles
303	Fish, frozen, excluding fish fillets and other fish meat of heading 0304	3.4700	-1.8734	Agriculture

Product Space: Exploring potential for higher exports in Pakistan

HS 1992 Code	Product	RCA	PCI	Sectors
2301	Flours, meals and pellets, of meat or meat offal, of fish or of crustaceans, molluscs or other aquatic invertebrates, unfit for human consumption; greaves (cracklings)	3.4500	-1.6503	Agriculture
2302	Bran, sharps (middlings) and other residues, whether or not in the form of pellets, derived from the sifting, milling or other working of cereals or of leguminous plants	3.3900	-2.2334	Agriculture
1211	Plants and parts of plants (including seeds and fruits), of a kind used primarily in perfumery, in pharmacy or for insecticidal, fungicidal or similar purposes, fresh or dried, whether or not cut, crushed or powdered	3.2500	-1.9016	Agriculture
1302	Vegetable saps and extracts; pectic substances, pectinates and pectates; agar-agar and other mucilages and thickeners, whether or not modified, derived from vegetable products	3.1600	-1.3643	Agriculture
5515	Other woven fabrics of synthetic staple fibers	3.1100	0.0219	Textiles
7407	Copper bars, rods and profiles	2.7900	0.3699	Metals
8211	Knives with cutting blades, serrated or not (including pruning knives), other than knives of heading 8208, and blades and other base metal parts thereof	2.6000	0.8192	Metals
6201	Men's or boys' overcoats, carcoats, capes, cloaks, anoraks (including ski-jackets), windbreakers and similar articles (including padded, sleeveless jackets), other than those of heading 6203	2.5800	-0.9440	Textiles
2001	Vegetables, fruit, nuts and other edible parts of plants, prepared or preserved by vinegar or acetic acid	2.5100	-0.9550	Agriculture
6217	Other made up clothing accessories; parts of garments or of clothing accessories, other than those of heading 6212	2.4000	-0.7377	Textiles
802	Other nuts, fresh or dried, whether or not shelled or peeled	2.3900	-1.6698	Agriculture
3401	Soap; organic surface-active products and preparations for use as soap, in the form of bars, cakes, molded pieces or shapes, whether or not containing soap; organic surface-active products and preparations for washing the skin, in the form of liquid	2.3600	-1.0221	Chemicals
5510	Yarn (other than sewing thread) of artificial staple fibers, not put up for retail sale	2.3600	0.0032	Textiles
3503	Gelatin (including gelatin in rectangular (including square) sheets, whether or not surface-worked or colored) and gelatin derivatives; isinglass; other glues of animal origin, excluding casein glues of heading 3501	2.2500	-0.1476	Chemicals
3903	Polymers of styrene, in primary forms	2.2400	0.5769	Chemicals
8212	Razors and razor blades (including razor blade blanks in strips), and base metal parts thereof	2.2300	-0.1907	Metals
7612	Aluminum casks, drums, cans, boxes and similar containers (including rigid or collapsible tubular containers), for any material (other than compressed or liquefied gas), of a capacity not exceeding 300 liters, whether or not lined or heat insulated, but no	2.2000	0.1271	Metals

HS 1992 Code	Product	RCA	PCI	Sectors
4201	Saddlery and harness for any animal (including traces, leads, knee pads, muzzles, saddle cloths, saddle bags, dog coats and the like), of any material	2.0600	0.0216	Agriculture
2607	Lead ores and concentrates	1.9900	-1.4469	Minerals
409	Amber or darker	1.9800	-1.0792	Agriculture
902	Tea, whether or not flavored	1.9800	-1.9574	Agriculture
1605	Crustaceans, molluscs and other aquatic invertebrates, prepared or preserved	1.9700	-1.7159	Agriculture
7615	Table, kitchen or other household articles and parts thereof, of aluminum; pot scourers and scouring or polishing pads, gloves and the like, of aluminum; sanitary ware and parts thereof, of aluminum	1.9600	-0.7598	Metals
407	Birds eggs, in shell, fresh, preserved or cooked	1.9400	-0.3034	Agriculture
9609	Pencils (other than those pencils of heading 9608), crayons, pencil leads, pastels, drawing charcoals, writing or drawing chalks and tailors' chalks	1.9000	-0.0871	Stone
7101	Pearls, natural or cultured, whether or not worked or graded but not strung, mounted or set; pearls, natural or cultured, temporarily strung for convenience of transport	1.9000	-0.4439	Machinery
306	Crustaceans, whether in shell or not, live, fresh, chilled, frozen, dried, salted or in brine; crustaceans, in shell, cooked by steaming or by boiling in water, whether or not chilled, frozen, dried, salted or in brine; flours, meals and pellets of crusta	1.8100	-2.0755	Agriculture
9018	Instruments and appliances used in medical, surgical, dental or veterinary sciences, including scintigraphic apparatus, other electro-medical apparatus and sight-testing instruments; parts and accessories thereof	1.8000	0.7835	Machinery
1108	Starches; inulin	1.7900	-0.6081	Agriculture
8901	Cruise ships, excursion boats, ferry boats, cargo ships, barges and similar vessels for the transport of persons or goods	1.7700	-0.6749	Vehicles
7306	Other tubes, pipes and hollow profiles (for example, open seamed or welded, riveted or similarly closed), of iron or steel	1.7500	-0.5845	Metals
712	Dried vegetables, whole, cut, sliced, broken or in powder, but not further prepared	1.7200	-1.2229	Agriculture
6108	Women's or girls' slips, petticoats, briefs, panties, night-dresses, pajamas, negligees, bathrobes, dressing gowns and similar articles, knitted or crocheted	1.7100	-1.6333	Textiles
208	Other meat and edible meat offal, fresh, chilled or frozen	1.6800	0.2428	Agriculture
5408	Woven fabrics of artificial filament yarn, including woven fabrics obtained from materials of heading 5405	1.6500	0.1903	Textiles
6403	Footwear with outer soles of rubber, plastics, leather or composition leather and uppers of leather	1.6200	-0.3588	Textiles
2401	Unmanufactured tobacco (whether or not threshed or similarly processed); tobacco refuse	1.6100	-1.6199	Agriculture
7801	Lead refined unwrought	1.5700	-1.5575	Metals

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HS 1992 Code	Product	RCA	PCI	Sectors
3003	Medicaments (excluding goods of heading 3002, 3005 or 3006) consisting of two or more constituents which have been mixed together for therapeutic or prophylactic uses, not put up in measured doses or in forms or packings for retail sale	1.5300	0.4900	Chemicals
2403	Other manufactured tobacco and manufactured tobacco substitutes; homogenized or reconstituted tobacco; tobacco extracts and essences	1.5000	-0.7795	Agriculture
2836	Carbonates; peroxocarbonates (percarbonates); commercial ammonium carbonate containing ammonium carbamate	1.5000	-0.4812	Chemicals
9706	Antiques older than one hundred years	1.4900	-1.3152	Textiles
5810	Embroidery in the piece, in strips or in motifs	1.4700	-0.4790	Textiles
7310	Tanks, casks, drums, cans, boxes and similar containers, for any material (other than compressed or liquefied gas), of iron or steel, of a capacity not exceeding 300 liters, whether or not lined or heat insulated, but not fitted with mechanical or thermal	1.4500	-0.0137	Metals
704	Cabbages, cauliflower, kohlrabi, kale and similar edible brassicas, fresh or chilled	1.4300	-1.0369	Agriculture
4811	Paper, paperboard, cellulose wadding and webs of cellulose fibers, coated, impregnated, covered, surface-colored, surface-decorated or printed, in rolls or rectangular (including square) sheets, of any size, other than goods of the kind described in heading	1.4200	0.3387	Agriculture
7005	Float glass and surface ground or polished glass, in sheets, whether or not having an absorbent, reflecting or non-reflecting layer, but not otherwise worked	1.4000	-0.2796	Stone
6002	Knitted or crocheted fabrics of a width not exceeding 30 cm, containing by weight 5 percent or more of elastomeric yarn or rubber thread, other than those of heading 6001	1.3900	-0.5100	Textiles
6210	Garments, made up of fabrics of heading 5602, 5603, 5903, 5906 or 5907	1.3800	-0.9192	Textiles
5407	Woven fabrics of synthetic filament yarn, including woven fabrics obtained from materials of heading 5404	1.3600	-0.6046	Textiles
5608	Knotted netting of twine, cordage or rope; made up fishing nets and other made up nets, of textile materials	1.3400	-1.2504	Textiles
2620	Slag, ash and residues (other than from the manufacture of iron or steel), containing arsenic, metals or their compounds	1.3300	-0.5856	Minerals
6214	Shawls, scarves, mufflers, mantillas, veils and the like	1.3300	-0.7055	Textiles
3907	Polyacetals, other polyethers and epoxide resins, in primary forms; polycarbonates, alkyd resins, polyallyl esters and other polyesters, in primary forms	1.3000	1.0413	Chemicals
1520	Glycerol, crude; glycerol waters and glycerol lyes	1.2900	-0.2608	Agriculture
2009	Fruit juices (including grape must) and vegetable juices, not fortified with vitamins or minerals, unfermented and not containing added spirit, whether or not containing added sugar or other sweetening matter	1.2800	-0.8408	Agriculture

HS 1992 Code	Product	RCA	PCI	Sectors
6914	Other ceramic articles	1.2600	0.3526	Stone
5804	Tulles and other net fabrics, not including woven, knitted or crocheted fabrics; lace in the piece, in strips or in motifs, other than fabrics of headings 6002 to 6006	1.2300	-0.3821	Textiles
3204	Synthetic organic coloring matter, whether or not chemically defined; preparations as specified in note 3 to this chapter based on synthetic organic coloring matter; synthetic organic products of a kind used as fluorescent brightening agents or as luminop	1.2200	0.5708	Chemicals
4411	Fiberboard of wood or other ligneous materials, whether or not bonded with resins or other organic substances	1.2200	0.0364	Agriculture
6205	Men's or boys' shirts	1.2100	-1.3370	Textiles
1214	Rutabagas (swedes), mangolds, fodder roots, hay, alfalfa (lucerne), clover, sainfoin, forage kale, lupines, vetches and similar forage products, whether or not in the form of pellets	1.1300	-0.9578	Agriculture
2306	Oilcake and other solid residues, whether or not ground or in the form of pellets, resulting from the extraction of vegetable fats or oils, other than those of heading 2304 or 2305	1.1300	-1.0816	Agriculture
6202	Women's or girls' overcoats,carcoats, capes, cloaks, anoraks (including ski-jackets), windbreakers and similar articles(including padded, sleeveless jackets), other than those of heading 6204	1.1100	-0.6045	Textiles
5601	Wadding of textile materials and articles thereof; textile fibers, not exceeding 5 mm in length (flock), textile dust and mill neps	1.0600	-0.1094	Textiles
2007	Jams, fruit jellies, marmalades, fruit or nut purée and fruit or nut pastes, obtained by cooking, whether or not containing added sugar or other sweetening matter	1.0500	-0.7085	Agriculture
6215	Ties, bow ties and cravats	1.0400	-0.1281	Textiles
2505	Natural sands of all kinds, whether or not colored, other than metal-bearing sands of chapter 26	1.0300	-0.7280	Minerals

6

Does Innovation Benefit Exporters in Pakistan more than Non-Exporters? An Analysis of Firms from the Textile, Light Engineering and Automotive Sectors

Rabia Arif¹ and Azam Chaudhry²

Abstract

Innovation is an essential catalyst for growth and competitiveness in the global economy. Yet, its specific impacts on firm performance remain inadequately explored, particularly across different sectors in the context of developing countries. This paper examines the effects of innovation on the performance of exporting and non-exporting firms within Pakistan's textile, light engineering, and automobile industries. Utilizing a modified version of the Crépon, Duguet, and Mairessec (1998) innovation model, we investigate the impact of various innovations on firm performance and explore how adopting complementary innovations influences outcomes. Our initial results imply that non-exporting firms benefit more from individual types of innovations and their respective combinations of innovations purely driven by younger firms. However, we get more nuanced results when we divide firms by sector. In the textile sector, dominated by exporters, innovation positively impacts firm outcomes through product and technological advancements, with the benefits focused on more extensive and established firms.

Conversely, in the light engineering sector, individual innovation adoption favors exporters, while adopting complementary innovations benefits non-exporters, especially young firms. In the automotive industry, innovation impacts exporters and non-exporters differently and favors older firms. These results add to our understanding of the innovation-performance nexus in Pakistan's industrial landscape and can provide practical insights for policymakers, industry stakeholders, and academics.

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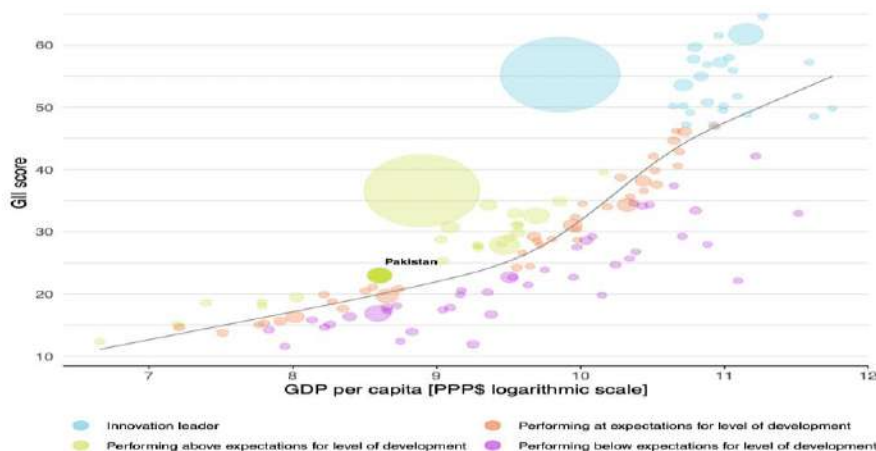
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Introduction

Innovation is a critical driver of competitive advantage, productivity growth, and economic resilience in the globalized economy. This holds true both at the macroeconomic and firm levels. As firms face intensifying pressures to adapt and remain competitive, innovation emerges as a catalyst for internal efficiencies and a key component for sustaining international competitiveness. By fostering productivity improvements, enhancing competitiveness, and enabling firms to penetrate global markets, innovation is essential for driving economic progress. The economic literature extensively explores the relationship between innovation and firm performance. Schumpeter (1942) highlighted the role of innovation in economic dynamism, allowing firms to create monopolistic advantages and improve performance. While innovation is crucial for both developed and developing countries, it holds particular significance for developing countries like Pakistan, where firms often operate under resource constraints and dynamic market conditions.

Figure 1.1 below shows a strong positive correlation between the Global Innovation Index (GII) score and its GDP per capita. The trend line represents the expected innovation performance levels based on a country's GDP per capita. Countries above the trend line outperform their expected innovation levels, while those below underperform.

Figure 1.1: Relationship between GDP per capita and innovation performance (GII score) across Countries



Source: Global Innovation Index, 2022- ranks approx. 132 countries based upon 80 indicators are released annually by the World Intellectual Property Organization (WIPO)

Pakistan is heavily reliant on traditional manufacturing sectors like textiles, light engineering, and automotive, lags in innovation. According to the Global Innovation Index 2021, Pakistan ranks 107th (118th in innovation inputs and 88th in innovation output), significantly lower than its peers in the lower middle-income group. Innovation can enable Pakistani firms to enhance performance, particularly in export markets. Both exporters and non-exporters can benefit from innovation. However, the specific ways in which these benefits manifest, especially when innovations are adopted in combination, remain underexplored in the context of Pakistan's industrial landscape.

Recent literature has delved deeper into the benefits of innovation, differentiating between various types such as product, process, technological, marketing, and business model innovations. Each type contributes differently to firm performance, impacting revenue growth, cost reduction, and market expansion. Another more intricate aspect is also attached to it: the nature and types of innovations. Moreover, the most suitable type of innovation for a specific country or industry may vary, highlighting the need for a tailored approach. Empirical studies, including those by Griliches (1998), O'Mahony et al. (2010), Abazi-Alili et al. (2017), and Exposito & Sanchis-Liopis (2018), have shown that product and Technological Innovations, especially when paired with robust R&D efforts, can significantly enhance firm productivity and market reach, particularly for exporting firms operating in competitive international markets.

Complementary innovation, the simultaneous adoption of multiple types of innovation simultaneously, has garnered attention for its potential to create synergistic effects. For instance, combining process and business model innovations can streamline operations and reduce costs, while product and Technological Innovations can drive market expansion and product differentiation (Hervas-Oliver et al., 2014; George & Teimuraz, 2018). However, the effectiveness of complementary innovation can vary across different contexts. Resource limitations, market conditions, and sector-specific dynamics can shape the efficacy of combined innovation efforts. In emerging economies like Pakistan, where sectors vary widely in technological readiness and export intensity, understanding these contextual dynamics is essential for tailoring innovation strategies to maximize firm performance.

Relevance to Pakistan's Textile, Light Engineering, and Automotive Sectors

Pakistan's industrial landscape is diverse, with the textile, light engineering, and automotive sectors playing a significant role. The export-oriented textile sector has demonstrated a proclivity for Product Innovation to meet international standards and shifting consumer demands (Wadho & Chaudhry, 2018). However, the light engineering sector, characterized by both exporters and non-exporters, reveals a different trend where process innovation is central to enhancing operational

efficiencies. The automotive industry, while potentially benefiting substantially from dual or complementary innovation, meanwhile, faces high adoption costs. These sector-specific dynamics suggest that the heterogeneity of innovation on firm performance, which may be potentially influenced by the factors such as export orientation.

While prior research underscores the importance of innovation in enhancing firm competitiveness, relatively few studies address how different types of innovation, and their combinations, impact exporters and non-exporters in developing countries. In Pakistan, there is limited evidence on the comparative benefits of innovation across firms of varying sizes, ages, and sectors, particularly regarding export activities. Additionally, the potential advantages of combining innovations, such as cost efficiency and product development, remain understudied in the Pakistani context, especially considering sector-specific constraints. This study aims to evaluate the impacts of five key types of innovation—product, process, technological, marketing, and business model—on critical performance indicators such as revenue growth, cost reductions, and price adjustments. By assessing whether complementary adoption yields additional benefits, this analysis also addresses whether dual innovations enhance firm outcomes beyond those achieved by singular innovation. Importantly, we have examined how these effects differ between exporting and non-exporting firms, reflecting sectoral heterogeneity across Pakistan's textile, light engineering, and automotive industries. This disaggregation allows us to account for potential sectoral variations in the impact of innovation on firm performance, providing insights into how industry-specific characteristics influence the effectiveness of innovation strategies in Pakistan's economy.

Literature Review

Innovation is widely acknowledged as a critical driver of economic growth, competitive advantage, and firm performance (Schumpeter, 1942). Schumpeter's emphasized the role of innovation in creating temporary monopolistic advantages that drive industrial progress and economic development. More recent research has explored this concept in greater detail, with firm-level analyses highlighting the importance of innovation and R&D in boosting productivity, efficiency, and profitability (Griliches, 1998; O'Mahony et al., 2010; Abazi-Alili et al., 2017; Exposito & Sanchis-Llopis, 2018). Griliches (1998) emphasized that innovation and R&D are highly correlated with productivity gains, particularly in high-tech sectors, where firms face constant pressure to improve products and processes. In addition to the traditional view of innovation, scholars have increasingly focused on distinguishing between different types of innovation, each impacting firms in unique ways. Hervas-Oliver et al. (2014) and George & Teimuraz (2018) argue that product, process, technological, marketing, and business model innovations have distinct impacts on firm performance. Product Innovation is crucial for differentiation in industries with evolving consumer needs, while process innovation is valuable for

cost efficiency and streamlined production (Dosi, 1988). In Pakistan, Wadho and Chaudhry (2018) found that Product Innovation significantly enhanced performance in textile and apparel manufacturing sector, underscoring its importance in export-oriented industries.

The literature also discusses the potential benefits of combining multiple types of innovation, often referred to as complementary or dual adoption. This approach can leverage synergies between different types of innovations, such as pairing process and Business Model Innovation to streamline operations and improve value proposition, or combining product and Technological Innovations to enhance product differentiation and market competitiveness (Cassiman & Veugelers, 2006; Belderbos et al., 2006; Bouncken et al., 2016). However, adopting complementary innovations can be challenging, particularly for resource-constrained SMEs. The high costs and risks associated with implementing dual innovation strategies can be significant barriers (Exposito & Sanchis-Llopis, 2018).

Innovation in Developing Economies and the Role of Export Orientation

In developing economies, the impact of innovation on firm performance is influenced by various contextual factors, including resource limitations, institutional frameworks, and market structures. Innovation can be particularly transformative for export-oriented firms, which face higher competitive pressures to meet international standards and deliver innovative products (Freeman, 2002; Girma et al., 2004). These firms are more likely to adopt product and process innovations to gain a competitive edge in global markets. Studies on export-led economies like China and India demonstrate that product and process innovations significantly bolster firms' export performance, contributing to national economic growth (Aw et al., 2000; Fu, 2008; Chen & Tang, 2013). Conversely, non-exporting firms, operating primarily in domestic markets, may prioritize innovation types that drive cost efficiency, such as process and business model innovations. These innovations can enhance internal operations without necessitating significant R&D investment as product or Technological Innovations as suggested by Cohen and Levinthal (1990) and Lall (1992).

The influence of innovation on firm performance also varies across industrial sectors. Sector-specific studies prove that different types of innovation yield varying benefits depending on industry characteristics, technological intensity, and competitive structure (Pavitt, 1984; Malerba, 2002). In the manufacturing sector, particularly textiles, process and Product Innovations have significantly boosted productivity and competitiveness (Nadvi, 1999; Wadho & Chaudhry, 2018). Pakistan's export-oriented textile sector, for example, benefit from Product Innovation to meet global demand for high-quality and unique products. In contrast, industries like light engineering, characterized by technological

advancement, often prioritizes process innovation for operational efficiency and cost control.

Automotive firms, particularly in developing economies, encounter distinct challenges in innovation due to high capital requirements and complex supply chains. Studies on automotive sectors in emerging markets demonstrate that technological and Marketing Innovations enhance firm competitiveness by improving product features and expanding market reach (Fujimoto, 2007; Iyer et al., 2009). However, the high costs of these innovations limit their adoption, particularly for smaller firms. Therefore, sectoral heterogeneity influences the impact of innovation on firm performance, underscoring the need for sector-specific innovation strategies.

Complementary Innovations and Synergistic Effects

While specific types of innovation can improve firm performance, the literature increasingly emphasizes the potential of complementary or dual innovations to create synergistic effects (Cassiman & Veugelers, 2002; Leiponen & Helfat, 2010). Combining innovation types can enable firms to address multiple business dimensions simultaneously, creating added value and resilience in changing markets. For instance, integrating technology with Marketing Innovation can enhance product appeal and accelerate market adoption, whereas combining process with Business Model Innovation can reduce costs and streamline value delivery (Bouncken et al., 2016). Cassiman and Veugelers (2006) highlight that firms in high-tech industries that engage in dual innovations achieve higher profitability and are more competitive than those that innovate in isolation. However, implementing complementary innovations can be challenging, especially in developing economies. The costs and risks associated with dual innovation are significant, particularly for smaller firms with limited financial and human resources (Freel, 2005). Resource constraints may force firms to prioritize specific innovations over others, limiting their ability to achieve the fully realize the benefits of complementary innovation (Rosenbusch et al., 2011). Additionally, firms in sectors with low technological readiness, may face difficulties integrating complementary innovations effectively, leading to diminished returns or negative synergies.

Despite the extensive literature on innovation, few studies have specifically examined how different types of innovation, and their combinations affect firm performance in Pakistan's textile, light engineering, and automotive sectors. Most research focuses on developed economies or fast-growing emerging markets, with limited attention to the nuanced impact of innovation in Pakistan, where firms operate under distinct institutional, financial, and market constraints. Additionally, while the benefits of complementary innovation are well-documented, more

research is needed to understand how these benefits vary between exporting and non-exporting firms in developing countries. This study aims to address these gaps by analyzing the effects of individual and complementary innovations on the performance of exporters and non-exporters in Pakistan's major industrial sectors. By examining sector-specific dynamics, this study seeks to gain a deeper understanding of innovation's role in driving competitiveness within Pakistan's economy.

Data Collection and Research Design

The Lahore School of Economics collected the primary data used in this study through a structured survey administered to textile, light engineering, and automotive firms in Punjab and Sindh, two of Pakistan's most industrialized provinces. These provinces were selected due to their significant industrial contributions, housing many firms engaged in manufacturing and export activities. This approach enabled us to capture the heterogeneity within each sector and the distinctions between exporting and non-exporting firms. The survey was administered over four years (2018-2021), providing a time-based perspective on innovation adoption and its outcomes in the context of evolving market conditions and policy changes. The sample of firms was drawn from the Directory of Industries and the Census of Manufacturing Industries (CMI). Firms were selected based on sector affiliation, firm size, and export orientation, ensuring a representative sample across varying firm demographics.

Moreover, the survey was designed to capture information on various forms of innovation adopted by firms, including product, process, technological, marketing, and business model innovations. In addition to innovation adoption, the survey captured vital performance indicators (KPIs) related to firm outcomes, such as revenue growth, cost reductions, and product pricing adjustments. Firms were asked to report on the types of innovation they had implemented and their specific impacts on performance metrics. For instance, firms were queried on whether product or process innovation had contributed to revenue increases or reductions in operational costs.

To quantify the impact of innovation impact, we utilized a modified Crépon, Duguet, and Mairessec (CDM) model, commonly used to evaluate the effects of innovation on firm performance. The model is well-suited for studies where innovation decisions and performance outcomes may be endogenous. This modification allowed us to address selection bias by estimating a latent variable that captures predicted innovation effort among firms actively investing in innovation. Additionally, the model accommodates binary response variables for firm performance indicators, such as increases in revenues or reductions in production costs, providing a robust framework for analyzing the effects of innovation.

To ensure data accuracy, firms reporting significant performance changes were cross-verified through follow-up interviews. Additionally, the survey included control questions to minimize response biases and discrepancies. Data from firms with incomplete or inconsistent responses were excluded from the final analysis. This rigorous approach helped compile a reliable dataset that accurately reflects the impact of innovation on firm performance across Pakistan's diverse industrial landscape.

Empirical Strategy and Econometric Methodology

This study employed a modified version of the Crépon, Duguet, and Mairessec (CDM) model to assess the differential impact of various types of innovation—product, process, technological, marketing, and business model—on the performance of exporting and non-exporting firm indicators, focusing on revenue growth, cost reduction, and product price adjustments. The CDM model is suitable for addressing potential endogeneity and selection bias, allowing for a more accurate estimation of the impact of innovation.

The CDM Model Framework

The modified CDM model in this study involves a multi-stage approach that examines (a) the firms' decisions to innovate, (b) the intensity of innovation efforts, and (c) the impact of these efforts on firm performance outcomes. The model first estimates the probability of firms deciding to innovate, considering specific firm characteristics and sectoral attributes. This addresses the endogeneity concern, as firms that choose to innovate may already have different performance trajectories. Next, the model measures the innovation effort, conceptualized as a latent variable representing the extent of a firm's investment in innovation activities, influencing its performance. This stage helps distinguish the impact of the actual intensity from its mere presence. The final stage then models the impact of individually and combined innovation on firm performance indicators using binary response variables. These response variables capture whether firms have achieved specific outcomes, such as revenue growth or cost reduction, due to their innovation efforts.

Econometric Specifications

The core econometric specification for this analysis involves a binary response model applied to performance indicators, capturing outcomes as binary (e.g., increase in revenues due to innovation, reduction in costs due to innovation, and reduction in prices due to innovation). For each innovation type (product, process, technological, marketing, business model) and their combinations, the model estimates the marginal effects on performance outcomes for exporting and non-exporting firms. The following econometric specifications are used:

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Probit Model for Innovation Adoption: We use a probit model to estimate the probability of innovation adoption. In the model, the dependent variable is a binary indicator of whether a firm has adopted any form of innovation, and the independent variables include firm characteristics (such as size, age, and sector) and market orientation (exporting vs. non-exporting).

$$P(I_i = 1) = \Phi(\alpha_0 + \alpha_1 \text{FirmSize}_i + \alpha_2 \text{FirmAge}_i + \alpha_3 \text{Sector}_i + \alpha_4 \text{Export}_i + \epsilon_i)$$

Where Φ is the cumulative distribution function of the standard normal distribution (for probit). *Firm size* (*FirmSize*), *firm age* (*FirmAge*), the industrial sector (*Sector*), and *whether the firm is an exporter* (*Export*), are firm-specific characteristics that influence the decision to innovate.

Linear Regression for Innovation Intensity: For firms that engage in innovation, the model estimates innovation intensity as a continuous latent variable representing the firm's effort in innovation. This latent variable is calculated based on observable inputs such as R&D expenditures, frequency of new product introductions, and the number of new processes adopted. Ordinary Least Squares (OLS) are applied where possible, while instrumental variable techniques address any remaining endogeneity concerns in innovation investment.

Binary Response Models for Performance Indicators: We use binary response models (such as probit or logit models) to assess the impact of innovation on performance. In these models, the dependent variables are revenue growth, cost reduction, and price adjustment. A binary indicator is used for each performance outcome, where 1 represents a positive outcome (e.g., revenue increase due to innovation) and 0 otherwise.

$$P(Y_{ij}=1) = \Phi(\gamma_0 + \gamma_1 \text{ProductInnovation}_i + \gamma_2 \text{ProcessInnovation}_i + \gamma_3 \text{TechnologicalInnovation}_i + \gamma_4 \text{MarketingInnovation}_i + \gamma_5 \text{BusinessModelInnovation}_i + \gamma_6 \text{Export}_i + \gamma_7 \text{Sector}_i + \eta_i)$$

$Y_{ij}=1$ indicates a positive performance outcome (e.g., revenue increase, price decrease, or cost) due to innovation type j . Each innovation type (*ProductInnovation*, *TechnologyInnovation*, *ProcessInnovation*, etc.) is a binary variable indicating whether or not I have adopted that type.

Moreover, to capture the synergistic effects of complementary innovations, this study introduces interaction terms between pairs of innovation types (e.g., product and process, technological and marketing). The model tests these dual adoption effects by including interaction variables and evaluating their statistical significance and effect sizes. Additionally, sectoral dummy variables are introduced to capture the industry-specific impact of innovation in the textile, light engineering, and

automotive sectors. These dummy variables help control for unobserved sectoral characteristics that may influence innovation impact, allowing for a more nuanced understanding of how innovation outcomes differ across industries.

Addressing Sectoral and Export Heterogeneity

By including interaction terms, we account for heterogeneity in innovation effects between exporters and non-exporters across sectors. These interaction terms combine innovation types with export orientation and sectoral indicators. This enables the model to estimate differential impacts for exporting firms within each industry compared to non-exporting firms. These interactions reveal how innovation types and their combinations may yield distinct outcomes depending on a firm's market orientation and the sectoral context in which it operates.

Results and Discussion

Overall descriptive Statistics

The descriptive statistics in Table 1 provide an overview of the firms in Pakistan's textile, light engineering, and automotive sectors, detailing firm demographics, innovation adoption, and sectoral characteristics. The sample comprises 300 firms from the country's primary industrial provinces, Punjab and Sindh, which collectively house a significant portion of Pakistan's manufacturing and export-driven activities. The sample of 300 firms includes approximately 29% from textiles, 25.4% from automotive, and 43.8% from light engineering. Each sector reflects unique market dynamics; for instance, the textile sector is primarily export-oriented, while light engineering includes a mix of both exporters and non-exporters. Within this sample, 49.9% of firms are engaged in exporting, providing a balanced comparison between firms with international exposure and those focused solely on domestic markets. Firm age and size are essential characteristics influencing innovation practices and potential outcomes. In terms of age, around 35.1% of firms are classified as "young" (15 years or younger), whereas 64.8% are considered "older" (over 15 years). This age distribution may influence innovation decisions, as younger firms may be more open to experimentation while older firms may have established processes that affect their innovation strategies. Firm size also shows variation, with small firms (those with 50 or fewer employees) making up 38.13% of the sample, while larger firms (more than 50 employees) comprise 61.9%. Since size is closely linked to financial and operational capacity, more prominent firms generally allocate more resources toward innovation than smaller firms, which may focus on cost-effective innovations.

Innovation adoption is prevalent within the sample, though the extent and type vary across firms with approximately 64.9% of firms reported engaging in some form of innovation. Product Innovation is the most widely adopted type, with 47.2%

of firms introducing new or improved products. This type of innovation is prevalent in the textile sector, where product differentiation is crucial for competitiveness in export markets. Technological Innovation, adopted by 31.2% of firms, reflects investments in new technology to enhance operational capabilities. Process innovation, aimed at improving efficiency and reducing costs, is adopted by 8.4% of firms, while Marketing Innovation is also reported by 8.4% of the firms. Business Model Innovation is relatively rare, with only 4% of firms employing it, suggesting limited strategic restructuring efforts among firms in these sectors.

Sectoral differences in innovation patterns are also evident. In the export-oriented textile sector, product and Technological Innovations are prominent, driven by the need to meet international standards and adapt to global market demands. In the light engineering sector, firms focus on cost-saving process innovations that enhance efficiency. The automotive sector, facing higher capital requirements and technological barriers, displays moderate product and Technological Innovation, primarily driven by larger firms. These sector-specific dynamics highlight the influence of industry-specific factors on innovation decisions, with firms tailoring their innovation strategies to align with sectoral demands and resource availability.

Average Impact of Innovation Type & its Complementarities

The analysis reveals that firms adopting specific types of innovation outperform non-innovators across key performance metrics, including revenue growth, cost reduction, and pricing strategies. Product Innovation is a significant driver with firms introducing new or improved products reporting higher revenues. This allows firms to meet market demand better, expand their customer base, and achieve cost efficiencies in production. Technological Innovation plays a crucial role in helping firms reduce the prices of their final products. By implementing automation and advanced production techniques, firms lower input costs and enhance production efficiency, passing these savings on to customers. This benefits non-exporting firms facing intense domestic competition.

Moreover, younger firms, particularly those that are non-exporting benefit most from innovation. These firms are more flexible in adopting new technologies and strategies, enabling them to adapt quickly to market demands and establish competitive price points. In contrast, older firms with more established processes may see more limited immediate benefits from innovation. Moreover, firm size also affects the impact of innovation. Small firms that engage in Technological Innovation report higher revenues and reduced prices than non-innovating small firms. For non-exporting small firms, these price reductions improve their positioning in price-sensitive domestic markets, allowing them to reach a broader customer base and compete effectively against larger firms. More concisely, product

and Technological Innovations have the most substantial positive impact on firm performance, particularly for younger, smaller, and non-exporting firms. These insights highlight the importance of aligning innovation strategies with firm characteristics to maximize performance outcomes.

Effect of Pairwise innovation adoption on the increase in Firm Revenue

Figure 1 illustrates the synergistic effects of adopting dual (pairwise) innovations on firm revenue, comparing the impacts of different innovation combinations. The results indicate that specific pairs of innovation types yield significantly higher revenue gains than others, highlighting the synergistic potential of complementary innovation strategies. The combination of Process Innovation and Business Model Innovation and the combination of Product Innovation and Technological Innovation demonstrate the strongest positive impact on revenue growth. The combination of Process Innovation and Business Model Innovation is particularly effective in driving revenue growth. This pairing enhances operational efficiency and strategic positioning, as process improvements streamline production or service delivery, while Business Model Innovation allows firms to restructure their value propositions. Combining these innovations enable firms to optimize costs and simultaneously create new revenue channels or improve existing ones, significantly boosting overall revenue.

Similarly, combining product and Technological Innovation has a robust positive effect on revenue. Product Innovation enables firms to introduce new or improved products to meet market demand, while Technological Innovation enhances production efficiency and quality. When adopted together, these innovations allow firms to differentiate their products in the market while benefiting from cost-effective and scalable production, leading to increased sales and higher revenue. This combination is especially advantageous in competitive sectors where product quality and differentiation are crucial for revenue growth. These complementary innovation strategies, particularly these two combinations, provide firms with a significant revenue advantage over single or isolated innovation efforts. These findings highlight the importance of adopting synergistic innovation approaches to enhance market position and maximize revenue potential.

The Impact of Pairwise Adoption of Innovation on Decreases in Output Prices

Figure 2 highlights how specific innovation combinations influence pricing strategies, cost competitiveness and reduce output prices. This illustrates the value of strategic innovation pairing in enhancing market competitiveness and driving cost efficiencies.

The combination of Product and Technological Innovation is particularly impactful in reducing output prices. Product Innovation enables firms to create or

improve offerings tailored to market needs, while Technological Innovation enhances production efficiency, reduces costs, and supports scalable output. These innovations allow firms to introduce high-quality products at more competitive prices. By leveraging technological advancements, firms can optimize processes, minimize production costs, and increase economies of scale, offering more cost-effective products without compromising quality. This strategic pairing thus provides a solid basis for firms to capture market share through lower pricing strategies while maintaining profitability.

Additionally, combining Process innovation with Business Model Innovation can reduce output prices. Process Innovation improves production or operational efficiency, resulting in cost savings that can be passed on to customers. Business Model Innovation redefines value delivery, further optimizing cost structures and pricing strategies. This synergy enables firms to offer differentiated value at reduced prices, enhancing market competitiveness.

Figure 2 illustrates the potential of strategic innovation pairing to achieve cost leadership. By strategically adopting combinations like Product and Technological Innovation or Process and Business Model Innovation, firms can achieve substantial cost efficiencies, translating into lower output prices and a stronger market position. These findings emphasize the critical role of innovation synergies in creating competitive advantages and driving business success.

Impact of Different Types of Innovation on Firm Performance Across Age and Export Status

The analysis in Table 3 shows that the impact on firm performance varies based on firm age and export status. Younger non-exporting firms showed a negative effect on revenues (-0.318) and a slight negative impact on prices and cost effect. In contrast, younger exporting firms exhibited a strong negative effect on revenue (-1.502***) and price, suggesting that innovation efforts might be associated with cost increases or challenges in market adaptation for young exporters. For older firms, the effects were somewhat different: non-exporters showed a negative revenue effect (-0.588***), while the price and cost effects were relatively neutral or positive. Older exporting firms positively affected price, cost efficiency, and revenue performance, indicating more maturity in leveraging innovation for market gains.

The impact of Business Modeling Innovation varied based on firm age and market status. Young non-exporting firms showed a significant positive revenue impact (0.560***) but a negative effect on cost (-0.433***). Young exporting firms had mixed results, with negative impacts on prices and costs. Older non-exporting firms saw consistent negative effects on cost and price indicators, while older exporting firms did not experience significant benefits. These findings suggest that Business Model Innovation may require careful cost control, particularly for older non-

exporting firms. Young exporting firms, however, may benefit from Product Innovation (28.886***), though with mixed results on cost and pricing.

On the other hand, non-exporting young firms displayed significant but smaller revenue increases. Older firms, both exporters and non-exporters, often experienced adverse revenue effects from Product Innovation. This suggests that the potentially high costs and market risks of developing new products may outweigh immediate revenue benefits for more mature companies. Exporting young firms benefited greatly from product differentiation, while older firms struggled to leverage new products profitably.

Additionally, young exporting firms experienced a significant negative impact on revenue and costs from process innovation (-3.379***). Non-exporting young firms also experienced a negative impact on costs and prices. Older firms exhibited a more muted response, with relatively minor changes across the board. This suggests that adopting new processes might present initial cost challenges for young firms, especially exporters. In contrast, older firms may have already optimized their operations or may not see immediate benefits. Technological Innovation had a positive impact, particularly for young exporting firms, leading to a significant increase in revenues (2.797***), indicating that new technologies provide substantial competitive advantages in international markets. Young non-exporting firms experienced modest revenue gains, while older non-exporting firms showed a positive impact on revenues (1.043*), but variable cost effects. Older exporting firms demonstrated mixed results, with negative price effects indicating challenges in managing costs or market competition.

Moreover, while engaging in Marketing Innovation, young firms experienced a notable increase in revenue, particularly exporters (6.529**). However, this was accompanied by a negative impact on cost-effectiveness. This suggests that marketing strategies can drive sales but may require careful cost management. For older firms, the impact of Marketing Innovation was minimal or negative, indicating limited benefits in terms of revenue, price, and cost indicators. This implies that younger firms may be more adaptable to new marketing strategies and can capitalize on new market segments, while older firms might struggle to achieve similar results.

Impact of Innovation Types on Performance across size, small and large Firms

The impact of innovation differed significantly between small and big firms. Small non-exporting firms faced a substantial negative impact on revenue (-0.948***) and prices, as given in Table 4, while cost changes were relatively minor. Small exporting firms exhibited more pronounced negative revenue effects (-2.450), though the results were not statistically significant, suggesting that innovation efforts may introduce initial inefficiencies or market challenges for these firms. Large

firms, both exporters and non-exporters, experienced more muted effects, with some positive impacts on price and revenue. This disparity indicates that while large firms may have more resources and capacity to buffer innovation-related costs, small firms may face more significant challenges in reaping immediate benefits from general innovation adoption.

Business Model Innovation had mixed results for small and large firms. Small non-exporting firms saw a marginally positive revenue impact (0.151) but significant negative impact on costs (-0.294**), indicating potential challenges in controlling expenses during business model adjustments. Small exporting firms experienced neutral effects. Large non-exporting firms experienced a significant negative impact on both revenue and costs (-0.298***, -0.472***), suggesting potential inefficiencies or market incompatibility with new business models. Large exporting firms experienced relatively neutral effects, highlighting that size and market access can moderate the outcomes of business model transformations.

Moreover, Product Innovation yielded contrasting results between small and large firms. Small non-exporting firms experienced a significant negative cost impact (-3.426***), indicating high production or R&D costs related to new products, while revenue and price impacts were less pronounced. Small exporting firms showed no significant gains or losses, implying they may struggle to capitalize on new products in competitive markets. For large firms, Product Innovation outcomes were mixed, with some observing a substantial revenue gain (10.234 for exporters) but inconsistencies in cost and pricing effects. This suggests that while Product Innovation can offer revenue potential for large firms, it may lead to complexities that affect cost management.

Also, the effects of process innovation varied with firm size and market engagement. Small firms generally exhibited minor changes in revenue, price, and costs. Large non-exporting firms also experienced relatively moderate shifts with no substantial or statistically significant gains or losses. This suggests that process adjustments alone might not be transformative for either group without complementary strategies. The limited influence on performance indicates that process innovation may have a more long-term, incremental effect than immediate transformative results.

Furthermore, small firms, particularly exporters, benefited from Technological Innovation (1.783** and 1.957**), highlighting their ability to leverage technology for competitive advantage. Non-exporting small firms also saw positive but lesser impacts. Large non-exporting firms had a mixed response with moderate gains in revenue, while large exporting firms showed variable outcomes. These results suggest that small firms might achieve significant gains through Technological Innovation due to their flexibility and market responsiveness. In contrast, large firms might face more complex dynamics in fully harnessing technological advancements.

Lastly, Marketing Innovation had a robust positive revenue impact on small non-exporting firms (0.247***), demonstrating its potential to drive sales in local markets. For small exporting firms, the effects were minimal. Among large firms, non-exporting firms faced more substantial challenges with negative impacts on revenue and costs, suggesting that marketing strategies alone may be insufficient without a broader support structure. Large exporting firms experienced minor negative changes in prices and costs, indicating that market-specific marketing adjustments may be required to achieve positive results. The results highlight the importance of tailored marketing strategies for different firm sizes and market engagements.

Impact of Innovation Complementarities on the Performance of the Firms for Exporters & Non-exporters

The combination of business and market innovation yielded mixed effects for exporters and non-exporters. Exporters experienced marginal negative impacts on all performance indicators, with coefficients around -0.025 to -0.049, indicating minimal improvements or slight declines due to this innovation pairing, as shown in Table 5. In contrast, non-exporters saw positive and statistically significant effects on revenue (0.178*) and cost efficiency (0.145**), highlighting that aligning business strategies with market needs can improve performance for firms primarily focused on domestic markets.

The combination of Business and Product Innovation led to generally negative but insignificant effects for exporters, with a minor impact on performance indicators. Non-exporting firms displayed marginal results with a slight positive impact on revenue (0.051), though cost and pricing changes were negligible. This suggests that integrating business model adjustments with new products might not yield immediate, substantial gains for exporting firms. At the same time, non-exporting firms may see limited benefits in aligning business practices with Product Innovation.

Exporting firms benefitted significantly from the pairing process and business innovation, as evidenced by a strong positive effect on revenue (0.109***). Non-exporting firms saw a similar trend with a notable impact on revenue (0.194***) and cost efficiency (0.145*). This combination suggests that improvements in operational efficiency, coupled with strategic business adjustments, can drive performance gains for both market groups. Moreover, this innovation combination yielded mixed and largely negative outcomes for both exporting firms and non-exporting firms. Exporting firms experienced negative impacts on performance indicators, particularly in prices and revenue, with coefficients of -0.055 to -0.116. Non-exporters faced a more significant negative impact on revenues (-0.370***), with some negative pricing effects. These results indicate potential difficulties in aligning process improvements with market strategies, possibly due to mismatches between

operational capabilities and market demands. Exporting firms showed mixed results from combining process and Technological Innovations, with some positive effects on cost efficiency (0.274*) and negative price impacts (-0.200**). Non-exporting firms, however, saw a notable positive impact on cost efficiency (0.561***), indicating that technological upgrades within production processes can substantially enhance operational efficiency for firms with limited market exposure.

Moreover, the combination of product and market innovation had mixed results for exporters and non-exporters. Exporting firms experienced a slightly positive impact on revenue but a statistically significant negative effect on prices (-0.324*), suggesting challenges in aligning product differentiation with market expectations. Non-exporters displayed minor positive effects on revenue (0.095*), but no significant cost improvements, indicating limited but targeted market gains. This combination resulted in mixed outcomes for exporters, with a negative impact on prices (-0.391**) but neutral effects on other indicators. Non-exporters experienced a slight positive impact on revenue (0.109), though cost efficiency was negatively affected (-0.174*). This suggests that while integrating product and process innovations can support revenue, it may come at the expense of cost control.

Exporting firms generally experienced negative impacts from the pairing of product and market innovation, though results were primarily insignificant. In contrast, non-exporters experienced a robust positive effect on revenue (0.372***) and prices (0.150***), suggesting that combining product development with technological enhancements can drive market gains, particularly for firms focused on domestic markets. Also, this combination yielded mixed results, with exporters facing a significant negative impact on pricing (-0.369***) but some positive effects on cost efficiency. Non-exporters saw moderate positive effects on revenue (0.114*) and cost efficiency (0.353***), indicating that technological advancements aligned with market strategies can boost domestic firm performance. The pairing of business and Technological Innovation negatively impacted exporters, particularly in pricing (-0.260***). Non-exporters faced a similarly negative impact on revenues (-0.202***), highlighting potential challenges in aligning broad business changes with new technologies for both market segments. The results suggest that while combining these innovations may introduce operational complexity, the benefits might not be immediately apparent without careful implementation strategies.

Sectoral Analysis: Types of Innovation and the Impact on Sector-wise Firms Performance

Innovation and Firms Performance in the Textile Sector

We report the results for the textile sector in Table 6. All 87 firms in the textile sector are exporters. This suggests that international market conditions primarily influence innovation and performance dynamics in this sector. A significant proportion (74.7%) of firms in the textile sector are established, with over 15 years of operation.

The remaining 25.3% are relatively younger. This distribution suggests that older firms may have more resources and experience to engage in innovation than newer firms. A majority (93.1%) of textile firms are significant, indicating that large firms dominate the sector and are likely better positioned to invest in and benefit from innovation activities. 65.5% of textile firms report engaging in innovation, which reflects a relatively high level of innovation activity in the sector.

Out of all, 4.6% of firms have innovated in business models and process improvements, suggesting that these areas are not a primary focus, as shown in Table 6. Only 2.2% of firms have focused on Marketing Innovation, indicating that firms in the textile sector may not prioritize changes to marketing strategies. A significant 57.5% of firms have engaged in Product Innovation, the sector's most common form of innovation, highlighting its importance for competitive advantage. 31% of firms have undertaken Technological Innovations, suggesting a moderate focus on technological advancements to improve production and operations. The overall impact of innovation on revenue in the textile sector is not statistically significant (-0.358). However, it is not statistically significant (indicated by the p-value in brackets), suggesting that general innovation activities may not significantly impact revenue in the textile sector. There is also a slight negative impact on pricing (-0.024) and costs (-0.285), though again these effects not statistically significant. This indicates that innovation may not have a drastic impact on pricing or cost strategies in the textile sector.

Business Modeling Innovation had a negligible and insignificant impact of on revenue (-0.058) pricing (-0.013) and cost (-0.069) for textile exporters, suggesting that Business Modeling Innovation does not significantly influence these performance metrics. Product Innovation had a significantly positive impact on revenue (0.303***) and pricing (0.253***), suggesting that it can drive revenue growth and pricing power. However, the negative effect on cost (-0.280***) suggests it may lead to increased costs, potentially due to research, development, and production adjustments. process innovation had minimal impact on revenue, price and costs (-0.055 for revenue, -0.216 for price and -0.080 for costs), suggesting that improvements in production processes have a neutral or negligible impact on revenue and pricing strategies and that process innovation does not significantly reduce costs.

Technological Innovation significantly impacts revenue (18.666*), indicating that firms implementing new technologies see substantial revenue increases, possibly through increased efficiency or new product offerings. While the positive effect on pricing (6.018) is statistically insignificant, suggesting that Technological Innovation increases revenues, it may not necessarily result in higher prices. Technological Innovation has a significant positive effect on cost (21.439*), indicating that while it increases revenues, it may also come with higher costs, likely due to investment in new technologies. Marketing Innovation, however, shows negligible

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and insignificant impacts on revenue (-0.081), price (-0.005), and cost (-0.082), suggesting it has a limited effect on performance indicators for firms in the textile sector.

Innovation Complementarities and Firms' Performance in the Textile Sector

As reported in Table 7, the effects of complementary innovation combinations on firm performance in the textile sector varied, with some combinations showing positive results while others lead to negative impacts. The combination of business and market innovation (Business*Marketing Innovation) shows a small negative effect on revenue (-0.048), which is not statistically significant. However, it does result in a statistically significant negative effect on price (-0.029*), suggesting that aligning business strategies with market needs may reduce the ability to charge higher prices. The effect on cost is also negative (-0.062) but not statistically significant, indicating no major impact on operational costs from this combination. Business and Product Innovation (Business*Product Innovation) shows substantial negative effects on both revenue (-0.380) and cost (-0.442). While these results are not statistically significant for revenue, integrating business modeling with Product Innovation may not achieve the desired outcomes.

Additionally, the negative effect on price (-0.142) implies that this combination might lower pricing power and lead to cost increases due to inefficiencies. The combination of process and business innovation (Process*Business Modelling Innovation) stands out as one of the more successful pairings, with a statistically significant positive impact on revenue (0.092***) and cost (0.103***), suggesting that aligning process improvements with business strategy can enhance revenue and reduce costs. The price impact is negligible (-0.010), showing that the changes in business and process innovations do not significantly affect pricing strategies.

For process and market innovation (Process*Marketing Innovation), the results show a positive but statistically insignificant effect on revenue (0.206), while the effect on cost (0.266) is also positive but not significant. The price effect is negative (-0.135) and statistically insignificant, indicating that although this combination shows some promise in reducing costs, it doesn't significantly impact revenues or pricing strategies. When process and Technological Innovation (Process*Technological Innovation) are combined, revenue has a positive effect (0.217) but is not statistically significant. The combination of process and Technological Innovation (Process*Technological Innovation) yields the most significant result. The significant negative effect on cost (-2.227**) suggests that technological improvements combined with process changes can lead to substantial cost savings. However, it may not have a strong impact on revenue. The combination of product and market innovation (Product*Marketing Innovation) results in negligible effects on revenue (0.003) and price (-0.115), both statistically

insignificant. However, the significant negative effect on cost (-0.362) suggests that this pairing can lead to cost reductions, likely due to better alignment between products and market needs.

Product and process innovation (Product*Process Innovation) yields a positive but statistically insignificant effect on revenue (-0.110) and a negligible effect on price (-0.014). However, the significant positive effect on cost (0.800**) suggests that integrating product development with process innovation leads to higher operational costs, potentially due to investments in production or process improvements. The combination of product and Technological Innovation (Product*Technolglcal Innovation) leads to significant negative impacts on both revenue (-2.869) and price (-1.912), with a smaller negative effect on cost (-1.223). These results suggest that combining product and Technological Innovations may result in reduced revenue, lower prices, and higher costs, indicating that this combination is unfavourable for performance in the textile sector.

The combination of technological and market innovation (Technological*Marketing Innovation) shows a negative effect on revenue (-0.429), a positive but insignificant effect on price (0.225) and cost (0.487). This suggests that while technological and market innovations may lead to higher costs and potentially higher prices, they fail to increase revenue significantly, making this pairing less effective. Finally, business and Technological Innovation (Business Modelling*Technological Innovation) leads to minor positive effects on revenue (0.129) and price (0.061), but these effects are not statistically significant. The cost effect (0.236) is also small and insignificant, indicating that while combining business and Technological Innovations may result in minor increases in revenue and price, the overall effect on performance is not substantial.

The analysis suggests that certain innovation pairings are more effective than others in the textile sector. The combination of process and business innovation appears to be particularly beneficial, leading to increased revenue and reduced costs. Conversely, other combinations like product and Technological Innovation or business and Product Innovation, show substantial negative impacts, particularly in revenue and pricing. This suggests that while innovation is crucial, it is important—especially for older and larger exporters—to carefully consider the specific combination of innovation types and their potential synergies.

Different Types of Innovation and Innovation Complementaries and Firms' Performance in the Light Engineering Sector

In the light engineering sector, the impact of innovation varies across different types of innovation and adoption strategies. Out of 131 firms in this sector, only 18.6% export their products abroad, indicating that the majority of firms operate within

domestic markets. The sector comprises 41.2% young firms, and the remaining 58.8% are older. In terms of size, 58% of firms are small (with fewer than 50 workers), while 41.9% are large (with more than 50 workers). Regarding innovation, 63.4% of firms report engaging in some form of innovation, with 34.4% of firms adopting Technological Innovation, 47.3% pursuing Product Innovation, 7.6% engaging in process innovation, 9.92% pursuing Marketing Innovation, and a very small percentage (0.76%) adopting business modeling innovation.

The results show some significant negative effects of innovation on average, mainly driven by the adoption of process innovation and Marketing Innovation individually. For instance, firms adopting process innovation saw decreased revenues and a significant cost increase, suggesting that while process improvements may offer long-term operational benefits, they may not immediately translate into financial gains. Similarly, Marketing Innovation led to a decline in revenues and a notable cost increase, possibly due to the costs associated with implementing new marketing strategies that did not effectively boost sales. These results indicate that process and Marketing Innovation alone may not improve overall performance, especially regarding revenue generation and cost control. However, exporters in the light engineering sector could significantly reduce their prices when they adopted business modeling, process, and Marketing Innovation individually. This price reduction benefit was notably more substantial for younger firms, which suggests that younger firms may be more adaptable and better positioned to leverage these innovations to adjust their pricing strategies. The ability to lower prices might provide younger exporters with a competitive advantage, potentially helping them capture a larger share of the market.

When examining the dynamics of complementary innovation adoption, certain strategic pairings emerged as particularly effective in price reduction strategies. Specifically, combinations such as process and Technological Innovation, product and Technological Innovation, and technological and Marketing Innovation demonstrated significant potential. Across these multifaceted innovation approaches, prices consistently declined, illustrating how strategic technological advancements with other forms of innovation can systematically drive down operational costs and enhance market competitiveness. For instance, the synergistic integration of process and Technological Innovation can substantially optimize operational efficiency, enabling firms to streamline cost structures and subsequently offer more competitive pricing to consumers. Notably—in contrast to their export-oriented counterparts—appeared to generate the most significant positive effects from dual innovation adoption. This suggests that domestically focused non-exporting firms, may possess greater agility in implementing innovative strategies, potentially due to less complex market dynamics, that facilitate more targeted and precise organizational improvements. Conversely, exporters confronting intricate international market landscapes might encounter more nuanced challenges when

attempting to integrate multiple innovation streams, thereby potentially constraining the immediate realization of innovation pairings benefits.

This shows that while standalone innovations such as process and Marketing Innovations often resulted in unfavorable outcomes, certain combinations of innovations—especially those involving technology—proved advantageous, particularly in reducing prices. Exporters, particularly younger firms, could benefit significantly from adopting specific innovations like business modeling and process innovation to improve their pricing strategies. Additionally, complementary innovation pairings such as product and Technological Innovation, hold considerable potential for improving price competitiveness. However, non-exporters may derive even greater advantages from these strategies, likely due to the less complex dynamics of domestic markets, which allow for more focused and effective implementation of innovation pairings.

Different Types of Innovation and Innovation Complementaries and Firms' Performance in the Automotive Sector

Among the 76 firms surveyed, 35% in the automobile sector export their final products internationally, while the remaining firms focus on domestic markets. The sector comprises 36.84% young firms, with the remaining 63.2% being older firms. In terms of size, 38.2% of firms are small (with fewer than 50 workers), while 61.8% are significant (with more than 50 workers). In terms of innovation practices, a substantial 67.11% of firms report engagement in some form of innovation. Specifically, 9.2% have adopted business modeling innovation, 13.2% engaging in Marketing Innovation, 14.5% pursuing process innovation, 34.2% adopting Product Innovation, and 27.63% have opted for Technological Innovation approaches.

The results show that innovation synergies—the strategic combination of diverse innovation types—tend to yield more substantial benefits for non-exporting firms. Notably, certain pairings demonstrated efficacy, such as business modeling with Marketing Innovation, process innovation coupled with business modeling innovation, process with Technological Innovation, product with Technological Innovation, and marketing with Technological Innovation were particularly advantageous for non-exporting firms. This pattern suggests that non-exporters, typically more attuned to local market dynamics, may be better positioned to leverage multifaceted innovation approaches. By aligning innovations across various operational dimensions, these firms appear to enhance their overall performance and competitive standing more effectively than their export-oriented counterparts.

On average, the results indicate that innovation outcomes are predominantly driven by Product Innovation, which significantly increases revenues, and Marketing Innovation, which not only increases revenues but also considerably

reduces prices. This underscores the dual role of product in driving revenue growth and Marketing Innovation in fostering competitiveness by increasing sales and enabling firms to lower their prices effectively. Notably, older firms that adopted Marketing Innovation experienced significantly increased revenues and reduced prices, suggesting that older firms are particularly well-positioned to benefit from Marketing Innovations. Their established reputation may enable them to implement strategies that attract a broader audience while lowering prices effectively to remain competitive.

Both, small and large firms, that adopted Product Innovation experienced significant revenue increases. However, the magnitude of this effect was substantially more significant for larger firms, with revenue growth being at least tenfold greater than that observed in small firms. Similarly, firms that adopted Technological Innovation experienced considerable revenue increases coupled with cost reductions. This underscores the efficacy of technological advancements in bolstering the financial performance of automobile firms, especially in terms of cost efficiency. Interestingly, large firms that adopted Marketing Innovation were able to reduce the price of their final products significantly. This points to the fact that larger firms can implement broad marketing strategies that not only boost revenue but also enable price reductions, thereby enhancing their competitive position in the market. Conversely, non-exporters experienced more adverse effects from adopting Product Innovation, including significantly reduced revenues and increased costs. This pattern suggests that for non-exporters, Product Innovations may not always be aligned with market demands, leading to operational inefficiencies and financial setbacks when these innovations are not meticulously managed and tailored to market needs.

The adoption of complementary innovation strategies yielded significant positive outcomes. Specifically, combinations such as business modeling with marketing and process innovation with Business Modeling Innovation resulted in higher revenues and reduced costs. Additionally, synergies like process and Technological Innovation, product and Technological Innovation, and marketing and Technological Innovation significantly reduced costs for the firms that adopted them. These results highlight that combining different types of innovation can amplify the benefits, particularly in reducing costs and enhancing revenue, with certain combinations offering more efficient pathways to improved performance. These results show that the key drivers of innovation success in the automobile sector are product and marketing, which lead to significant revenue growth. However, the impact of these innovations is more pronounced for more extensive, older firms. Non-exporters in the sector face challenges with Product Innovation, which can result in reduced revenues and increased costs. However, firms that adopted complementary innovation strategies—such as combining business modeling with Marketing Innovation or product with Technological Innovation —

showed more promising results in reducing costs and boosting revenues. These insights suggest that firms in the automobile sector should adopt a holistic approach to innovation, strategically combining multiple types of innovations work together to enhance operational efficiency and market competitiveness.

Conclusion

In conclusion, our analysis reveals a nuanced understanding of how various innovation types and their combinations impact firms across different sectors. While the average results across sectors suggest some common trends, they often fail to capture the underlying heterogeneity of the effects, highlighting the importance of considering firm-specific characteristics, sectoral dynamics, and innovation synergies. In the textile sector, the effects of innovation differ significantly between larger, older firms and smaller, younger ones. Product Innovation, in isolation, primarily benefits larger and more established firms, enhancing their ability to generate revenue. Conversely, Technological Innovation predominantly supports larger firms, helping them improve operational efficiency and productivity. However, there is an apparent synergistic effect when innovation types are combined, mainly process innovation with business modeling innovation. This combination results in increased revenues and reduced costs, demonstrating that firms—especially larger ones—can achieve better performance by aligning different types of innovation. This synergy underscores the importance of integrating various innovation strategies to achieve optimal outcomes, particularly in the textile sector, where the impact of individual innovations can be limited without a complementary strategy.

In the light engineering sector, our findings underscore the critical role that export status plays in shaping the benefits derived from innovation. Younger, non-exporting firms benefit significantly from adopting business modeling, process innovation, and Marketing Innovation. These firms effectively leverage innovation to enhance operational efficiency and drive revenue growth, with benefits particularly pronounced for non-exporters. Moreover, the strategic combination of process and Technological Innovation, product and Marketing Innovation, as well as product and Technological Innovation, significantly bolsters their performance by reducing costs. These combinations illustrate how strategic innovation adoption can empower non-exporting firms to compete effectively, particularly when aligned with market demands. In contrast, for exporters in this sector, the impact of innovation are more heterogenous, with specific innovations facilitating efficiencies or boosting revenue depending on the firm's age and size.

The automobile sector presents a compelling case study: product and Marketing Innovation are vital for driving revenue growth. However, the magnitude of these effects differs by firm size. Larger firms derive greater benefits from Marketing Innovation, which enables them to reduce product prices and expand their market

share. In contrast, Technological Innovation delivers more significant cost reductions for smaller firms, which may lack the same resources or market power of their larger counterparts. This sector also illustrates the importance of innovation combinations. Notably, combining process and Technological Innovation and marketing with Technological Innovation has proven particularly beneficial for non-exporters. This further emphasizes the necessity for targeted innovation strategies that address the unique needs of non-exporting firms.

Our results suggest that specific innovation synergies have particularly positive effects across sectors. For instance, combinations like process innovation with Technological Innovation and Product Innovation with Technological Innovation consistently led to cost reductions across industries, especially for non-exporting firms. These synergies enable firms to streamline operations, minimize inefficiencies, and improve their competitive position in the market. Similarly, ****Marketing Innovation****, when paired with other types of innovation, helped firms lower their prices and strengthen their market positioning. However, its benefits were more pronounced for larger firms in specific sectors. Overall, our findings underscore the critical importance of understanding the sector-specific dynamics of innovation adoption. While the average results may provide valuable insights into general trends, they often mask the variation in impacts that different types of innovation have on firms of different sizes, ages, and export statuses. In particular, the complementary nature of various innovation strategies is essential to understanding how firms can optimize their performance through innovation. Policymakers and business leaders must recognize that innovation is not a one-size-fits-all solution. Firms must adopt strategies tailored to their specific characteristics and market contexts to truly benefit from innovation.

Thus, our analysis stresses the importance of a differentiated approach to innovation management, where firms consider the type of innovation they adopt and how different innovations can work together to drive long-term growth and competitiveness. The impact of innovation, whether positive or negative, depends on the sector, the firm's position within the sector (exporter vs. non-exporter), and the firm's size and age. Therefore, for businesses looking to remain competitive, adopting a holistic and context-specific approach to innovation will be vital to maximizing the benefits and minimizing the risks associated with innovation adoption.

Appendix

Figure 1: Examining the Impact of Pair-wise Adoption of Innovation on Increase in Firm Revenue

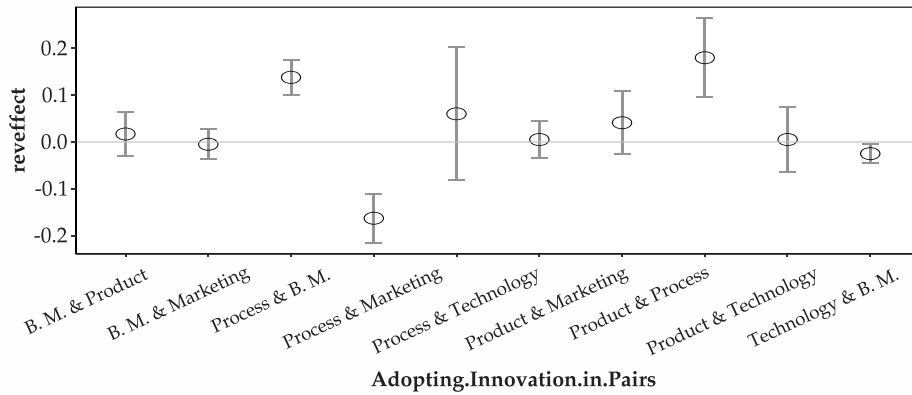
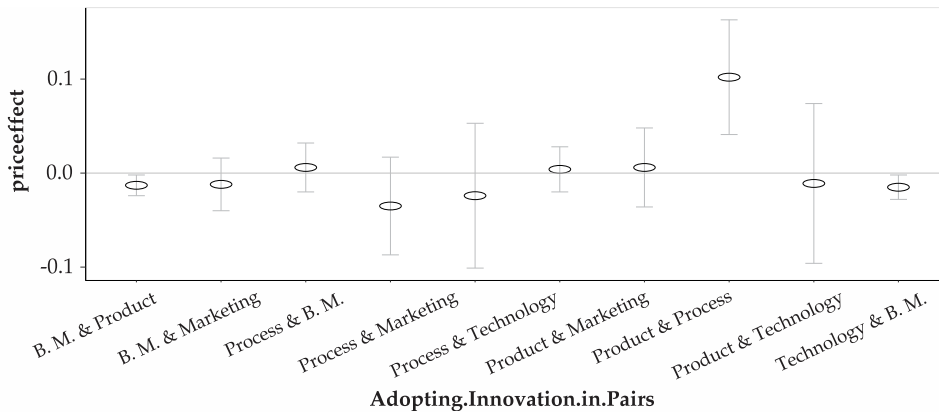


Figure 2: Examining the Impact of Pairwise Adoption of Innovation on Decreases in Output Prices



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Figure 3: Examining the Impact of Pairwise Adoption of Innovation on Decreases in Firm's Costs

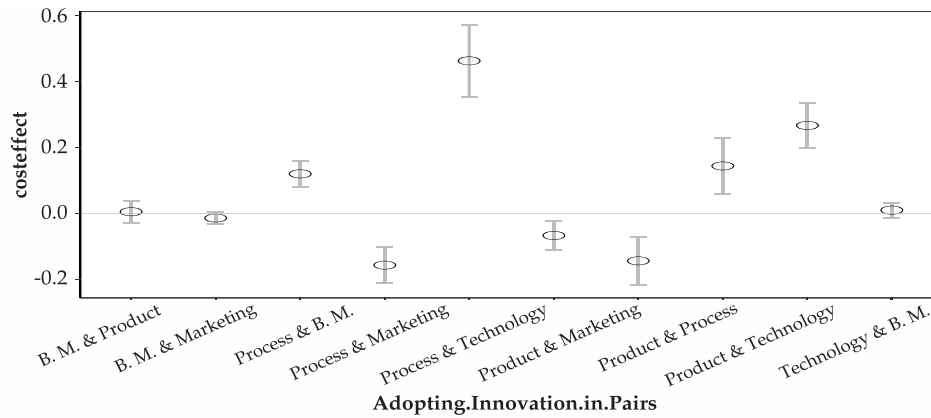


Table 1: Descriptive Statistics, by Sector

Types of Innovation	Observations	Mean	Std. dev	Min	Max
Textile Sector					
Dummy=1 if firms engage in anytype of Innovation	87	0.6551724	0.4780675	0	1
Dummy=1 if firms engage in Business Modelling innovation	87	0.045977	0.2106494	0	1
Dummy=1 if firms engage in Process Innovation	87	0.045977	0.2106494	0	1
Dummy=1 if firms engage in Product Innovation	87	0.5747126	0.4972525	0	1
Dummy=1 if Firms engage in Technological Innovation	87	0.3103448	0.4653167	0	1
Dummy=1 if Firms engage in Marketing Innovation	87	0.0229885	0.1507355	0	1
Lightengineering Sector					
Dummy=1 if firms engage in anytype of Innovation	131	0.6335878	0.4836736	0	1
Dummy=1 if firms engage in Business Modelling innovation	131	0.0076336	0.0873704	0	1
Dummy=1 if firms engage in Process Innovation	131	0.0763359	0.2665541	0	1
Dummy=1 if firms engage in Product Innovation	131	0.4732824	0.5012023	0	1
Dummy=1 if Firms engage in Technological Innovation	131	0.3435115	0.4767033	0	1
Dummy=1 if Firms engage in Marketing Innovation	131	0.0992366	0.3001272	0	1
Automobile Sector					
Dummy=1 if firms engage in anytype of Innovation	76	0.6710526	0.429527	0	1
Dummy=1 if firms engage in Business Modelling innovation	76	0.0921053	0.2910959	0	1
Dummy=1 if firms engage in Process Innovation	76	0.1447368	0.3541731	0	1
Dummy=1 if firms engage in Product Innovation	76	0.3421053	0.4775669	0	1
Dummy=1 if Firms engage in Technological Innovation	76	0.2763158	0.4501462	0	1
Dummy=1 if Firms engage in Marketing Innovation	76	0.1315789	0.3402785	0	1

Table 2: Measuring the Impact of the Type of Innovation on the Firm's Performance for Exporters & Non-exporters

Types of Innovation	Exporters			Non-exporter		
Any innovation	0.028 [0.394]	0.043 [0.289]	0.182 [0.391]	-0.287 [0.180]	-0.393** [0.190]	-0.328 [0.206]
Business Modelling Innovation	-0.032 [0.052]	0.006 [0.039]	-0.043 [0.062]	-0.083 [0.074]	-0.023 [0.054]	-0.106 [0.103]
Product Innovation	0.071 [0.489]	0.414 [0.376]	-0.227 [0.588]	-0.052 [0.493]	-0.634** [0.307]	-1.483*** [0.516]
Process Innovation	-0.084 [0.081]	0.010 [0.126]	-0.013 [0.122]	-0.016 [0.083]	-0.051 [0.104]	-0.010 [0.171]
Technological Innovation	-0.760*** [0.271]	-0.279 [0.211]	0.197 [0.325]	0.641 [0.501]	1.092** [0.521]	0.796 [0.496]
Marketing Innovation	-0.077 [0.050]	-0.009 [0.038]	-0.042 [0.056]	0.026 [0.055]	0.050 [0.084]	0.095 [0.142]

Note: The three different dependent variables of the specifications comprise dummy=1 if the firm's revenues increased due to innovation, dummy=1 if the firm's product price decreased due to innovation, and dummy=1 if the firm's cost decreased due to innovation. The primary independent variable is dummy=1 if the firm decides to innovate. Other independent variables comprise the firm's characteristics such as firm's age, age squared, number of workers employed by firm, dummy=1 if the firm exports, dummy=1 if the firm has diversified products, dummy=1 if the firm makes the technology, dummy=1 if the firm buys the technology (keeping does not invest in technology), dummy=1 if the firm is publicly owned, dummy=1 if the firm is private limited, dummy=1 if the firm is family owned (keeping proprietorship as base category). The specifications control district and sector-fixed effects for textile, surgical, light engineering, and automobile. Time-fixed effects for years 2018, 2019, 2020, and 2021 are also controlled.

Robust standard errors in brackets are clustered at a firm level.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 3: Measuring the Impact of Type of Innovation on a Firm's Performance for Exporters & Non-exporters by the age of the firm

	young firms						old firms					
	Revenues	Prices	cost-effect	Revenues	price	cost	Revenues	price	cost	Revenues	Prices	Cost effect
Types of Innovation	non-exporter			exporter			non-exporter			exporter		
Any innovation	-0.318 [0.517]	-1.502*** [0.414]	-0.368 [0.459]	-1.194 [0.841]	-0.530 [0.528]	-0.870 [0.597]	-0.588*** [0.206]	-0.224 [0.286]	-0.220 [0.339]	0.341 [0.395]	0.499 [0.327]	0.424 [0.493]
Business Modelling Innovation	0.560*** [0.093]	-0.079 [0.107]	-0.433*** [0.119]	-0.236** [0.100]	0.148 [0.167]	-0.282*** [0.103]	-0.063 [0.068]	-0.062 [0.069]	-0.302** [0.131]	-0.040 [0.062]	-0.030 [0.044]	-0.074 [0.056]
Product Innovation	6.111 [9.940]	28.886*** [7.967]	7.078 [8.829]	-45.825*** [6.160]	-1.842 [4.581]	-2.996 [4.935]	-1.856** [0.914]	-1.692** [0.699]	-2.920** [1.116]	0.281 [0.702]	0.354 [0.621]	0.302 [0.665]
Process Innovation	-0.875 [1.186]	-3.379*** [0.902]	-1.024 [1.082]	-0.101 [0.083]	0.383*** [0.033]	-0.145 [0.108]	0.053 [0.103]	0.088 [0.097]	-0.008 [0.201]	-0.124 [0.134]	-0.116 [0.128]	-0.031 [0.149]
Technological innovation	0.625 [0.975]	2.797*** [0.789]	0.643 [0.876]	-4.357*** [0.681]	0.082 [0.661]	-0.319 [0.598]	1.043* [0.597]	0.454 [0.786]	0.790 [0.814]	-0.607* [0.312]	-0.293 [0.246]	0.350 [0.386]
Marketing innovation	4.887 [3.087]	6.529** [3.080]	-4.367 [2.713]	-0.106 [0.096]	0.066 [0.106]	-0.071 [0.092]	0.107 [0.111]	0.101 [0.092]	0.003 [0.207]	-0.085 [0.061]	-0.043 [0.039]	-0.090 [0.074]

Note: The three different dependent variables of the specifications comprise dummy=1 if the firm's revenues increased due to innovation, dummy=1 if the firm's product price decreased due to innovation, and dummy=1 if

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the firm's cost decreased due to innovation. The primary independent variable is dummy=1 if the firm decides to innovate. Other independent variables comprise the firm's characteristics such as firm's age, age squared, number of workers employed by firm, dummy=1 if the firm exports, dummy=1 if the firm has diversified products, dummy=1 if the firm makes the technology, dummy=1 if the firm buys the technology (keeping does not invest in technology), dummy=1 if the firm is publicly owned, dummy=1 if the firm is private limited, dummy=1 if the firm is family owned (keeping proprietorship as base category). The specifications control district and sector-fixed effects for textile, surgical, light engineering, and automobile. Time-fixed effects for years 2018, 2019, 2020, and 2021 are also controlled.

Robust standard errors in brackets are clustered at a firm level.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 4: Measuring the Impact of Type of Innovation on a Firm's Performance for Exporters & Non-exporters by the size of the firm

Types of Innovation	Small firms						Big firms					
	Revenues	Price	Cost	Revenues	Price	Cost	Revenues	Price	Cost	Revenues	Price	Cost
	non-exporter			exporter			non-exporter			exporter		
Any innovation	-0.948*** [0.355]	-0.991** [0.403]	-0.259 [0.394]	-2.450 [1.739]	-0.570 [1.257]	0.003 [1.790]	0.219 [0.435]	-0.029 [0.489]	-0.532 [0.420]	0.918 [0.661]	0.331 [0.341]	-0.065 [0.734]
Business Modelling	0.151 [0.108]	-0.168 [0.155]	-0.294** [0.123]	-0.016 [0.190]	0.237 [0.147]	-0.088 [0.138]	-0.298*** [0.062]	-0.068 [0.072]	-0.472*** [0.073]	-0.018 [0.060]	-0.011 [0.031]	-0.044 [0.063]
Innovation Product	-0.997 [1.186]	0.857 [1.181]	-3.426*** [1.146]	-1.031 [0.827]	-0.252 [0.494]	-0.067 [0.698]	-4.217 [8.364]	0.564 [9.411]	10.234 [8.070]	0.528 [0.839]	0.782 [0.650]	-0.377 [0.569]
Process Innovation	0.123 [0.087]	-0.120 [0.107]	0.091 [0.146]	-0.013 [0.160]	0.212* [0.118]	-0.094 [0.116]	0.423 [1.009]	-0.196 [1.119]	-1.550 [0.940]	-0.111 [0.170]	-0.179 [0.132]	0.085 [0.117]
Technological innovation	1.783** [0.696]	1.957** [0.785]	0.391 [0.761]	-2.665 [2.378]	0.083 [3.471]	1.568 [4.153]	-0.387 [0.831]	0.072 [0.942]	1.066 [0.796]	-1.360 [1.341]	-0.023 [0.511]	0.112 [1.537]
Marketing innovation	0.247*** [0.065]	-0.008 [0.093]	0.076 [0.143]	0.026 [0.130]	0.073 [0.170]	0.005 [0.136]	-2.298 [1.527]	-1.059 [1.722]	-0.439 [1.943]	-0.090* [0.052]	-0.019 [0.034]	-0.044 [0.062]

Note: The three different dependent variables of the specifications comprise dummy=1 if the firm's revenues increased due to innovation, dummy=1 if the firm's product price decreased due to innovation, and dummy=1 if the firm's cost decreased due to innovation. The primary independent variable is dummy=1 if the firm decides to innovate. Other independent variables comprise the firm's characteristics such as firm's age, age squared, number of workers employed by firm, dummy=1 if the firm exports, dummy=1 if the firm has diversified products, dummy=1 if the firm makes the technology, dummy=1 if the firm buys the technology (keeping does not invest in technology), dummy=1 if the firm is publicly owned, dummy=1 if the firm is private limited, dummy=1 if the firm is family owned (keeping proprietorship as base category). The specifications control district and sector-fixed effects for textile, surgical, light engineering, and automobile. Time-fixed effects for years 2018, 2019, 2020, and 2021 are also controlled.

Robust standard errors in brackets are clustered at a firm level.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 5: Measuring the impact of Innovation Complementarities on the Firm's Performance for Exporters & Non-Exporters

Dependent Variables	Exporters				Non-exporter	
bus_market	-0.025 [0.039]	-0.049 [0.031]	-0.024 [0.045]	0.178* [0.104]	0.029 [0.061]	0.145** [0.071]
bus_prod	-0.12 [0.148]	-0.144 [0.120]	-0.093 [0.178]	0.051 [0.049]	0.003 [0.037]	-0.008 [0.064]
proc_bus	0.109*** [0.039]	-0.001 [0.023]	0.068 [0.056]	0.194*** [0.069]	0.026 [0.055]	0.145* [0.074]
process_market	-0.055 [0.095]	-0.108 [0.081]	-0.116 [0.125]	-0.370*** [0.137]	-0.150* [0.079]	0.022 [0.149]
process_tech	0.125 [0.112]	-0.200** [0.081]	0.274* [0.160]	-0.063 [0.195]	0.028 [0.100]	0.561*** [0.183]
prod_market	0.013 [0.192]	-0.324* [0.186]	-0.196 [0.263]	0.095* [0.054]	0.006 [0.026]	-0.073 [0.064]
prod_proc	0.021 [0.175]	-0.391** [0.192]	-0.009 [0.315]	0.109 [0.078]	0.015 [0.047]	-0.174* [0.096]
prod_tech	-0.043 [0.717]	-0.422 [0.541]	0.124 [0.833]	0.372*** [0.107]	0.150*** [0.048]	0.092 [0.119]
tech_market	-0.101 [0.182]	-0.369*** [0.087]	0.179 [0.116]	0.033 [0.136]	0.114* [0.066]	0.353*** [0.112]
bus_tech	-0.182 [0.156]	-0.260*** [0.082]	0.1 [0.145]	-0.202*** [0.075]	-0.028 [0.054]	-0.083 [0.091]

Note: The three different dependent variables of the specifications comprise dummy=1 if the firm's revenues increased due to innovation, dummy=1 if the firm's product price decreased due to innovation, and dummy=1 if the firm's cost decreased due to innovation. The main independent variable is dummy=1 if the firm decides to innovate. Other independent variables comprise the firm's characteristics such as the firm's age, age squared, number of workers employed by the firm, dummy=1 if the firm exports, dummy=1 if the firm has diversified products, dummy=1 if the firm makes the technology, dummy=1 if the firm buys the technology (keeping does not invest in technology), dummy=1 if the firm is publicly owned, dummy=1 if the firm is private limited, dummy=1 if the firm is family owned (keeping proprietorship as base category). The specifications control district and sector-fixed effects for textile, surgical, light engineering, and automobile. Time-fixed effects for years 2018, 2019, 2020, and 2021 are also controlled.

Robust standard errors in brackets are clustered at a firm level.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 6: Measuring the Impact of Type of Innovation on The Textile Sector's Performance

Types of Innovation	Textile Sector		
	Revenues	Price	Cost
Any innovation	-0.358 [0.551]	-0.024 [0.500]	-0.285 [0.539]
Business Modelling Innovation	-0.058	-0.013	-0.069
Product Innovation	0.303*** [0.059]	0.253*** [0.083]	-0.280*** [0.065]
Process Innovation	-0.055 [1.169]	-0.216 [0.525]	-0.080 [1.221]
Technological innovation	18.666* [9.608]	6.018 [5.932]	21.439* [11.672]
Marketing innovation	-0.081 [0.061]	-0.005 [0.033]	-0.082 [0.066]

Note: The three different dependent variables of the specifications comprise dummy=1 if the firm's revenues increased due to innovation, dummy=1 if the firm's product price decreased due to innovation, and dummy=1 if the firm's cost decreased due to innovation. The main independent variable is dummy=1 if the firm decides to

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innovate. Other independent variables comprise the firm's characteristics such as firm's age, age squared, number of workers employed by firm, dummy=1 if the firm exports, dummy=1 if the firm has diversified products, dummy=1 if the firm makes the technology, dummy=1 if the firm buys the technology (keeping does not invest in technology), dummy=1 if the firm is publicly owned, dummy=1 if the firm is private limited, dummy=1 if the firm is family owned (keeping proprietorship as base category). The specifications control district and sector-fixed effects for textile, surgical, light engineering, and automobile. Time-fixed effects for years 2018, 2019, 2020, and 2021 are also controlled.

Robust standard errors in brackets are clustered at a firm level.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 7: Measuring the Impact of Complimentary Adoption of Innovation on the Textile Sector's Performance

Complimentary Innovation	Textile Sector		
	Revenues	Price	Cost
bus_market	-0.048 [0.054]	-0.029* [0.015]	-0.062 [0.059]
bus_prod	-0.380 [0.355]	-0.142 [0.134]	-0.442 [0.391]
proc_bus	0.092*** [0.031]	-0.010 [0.013]	0.103*** [0.037]
process_market	0.206 [0.337]	-0.135 [0.230]	0.266 [0.500]
process_tech	0.217 [0.800]	0.011 [0.311]	-2.227** [1.074]
prod_market	0.003 [0.280]	-0.115 [0.136]	-0.362 [0.309]
prod_proc	-0.110 [0.263]	-0.014 [0.126]	0.800** [0.370]
prod_tech	-2.869 [3.565]	-1.912 [2.033]	-1.223 [4.044]
tech_market	-0.429 [0.670]	0.225 [0.426]	0.487 [0.844]
bus_tech	0.129 [0.645]	0.061 [0.375]	0.236 [0.742]

Note: The three different dependent variables of the specifications comprise dummy=1 if the firm's revenues increased due to innovation, dummy=1 if the firm's product price decreased due to innovation, and dummy=1 if the firm's cost decreased due to innovation. The main independent variable is dummy=1 if the firm decides to innovate. Other independent variables comprise the firm's characteristics such as firm's age, age squared, number of workers employed by firm, dummy=1 if the firm exports, dummy=1 if the firm has diversified products, dummy=1 if the firm makes the technology, dummy=1 if the firm buys the technology (keeping does not invest in technology), dummy=1 if the firm is publicly owned, dummy=1 if the firm is private limited, dummy=1 if the firm is family owned (keeping proprietorship as base category). The specifications control district and sector-fixed effects for textile, surgical, light engineering, and automobile. Time-fixed effects for years 2018, 2019, 2020, and 2021 are also controlled.

Robust standard errors in brackets are clustered at a firm level.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 8: Measuring the Impact of Type of Innovation on the Textile Sector's Performance by Age & Size

Types of Innovation	young			old			small			big		
	Revenues	Price	Cost	Revenues	Price	Cost	Revenues	Price	Cost	Revenues	Price	Cost
Any	-2.358***	-0.471	-1.920**	0.210	0.648	0.566	-1.098	-5.981	-1.098	0.305***	0.301***	-0.255***
innovation	[0.678]	[1.072]	[0.893]	[0.504]	[0.554]	[0.550]	[0.000]	[0.000]	[0.000]	[0.062]	[0.076]	[0.069]
Business	-0.316**	-0.079	-0.350**	-0.086**	-0.038*	-0.113***	-54.985	-174.953	3.946	-0.069	-0.011	-0.084
Modelling	[0.134]	[0.085]	[0.147]	[0.033]	[0.022]	[0.035]	[0.000]	[0.000]	[0.000]	[0.048]	[0.017]	[0.054]
Innovation												
Product	-0.452***	-0.049	0.106	0.296***	0.334***	-0.234***	-2.989	-7.148	1.808	0.306***	0.302***	-0.256***
Innovation	[0.141]	[0.121]	[0.163]	[0.071]	[0.092]	[0.067]	[3.010]	[8.052]	[2.058]	[0.062]	[0.076]	[0.069]
Process	-3.920	-0.045	-3.070	1.210	0.464	1.051	3.752	11.939	-0.269	0.833	-0.369	0.264
Innovation	[2.920]	[2.238]	[3.024]	[1.054]	[0.483]	[1.370]	[0.000]	[0.000]	[0.000]	[0.925]	[0.584]	[1.261]
Technological	15.711	3.251	1.987	13.133	5.287	21.462	74.343	236.546	-5.336	18.080*	4.474	21.099
innovation	[38.443]	[23.473]	[41.284]	[14.039]	[8.267]	[17.498]	[0.000]	[0.000]	[0.000]	[10.808]	[6.532]	[13.473]
Marketing	-0.048	-0.017	-0.004	-0.098	-0.023	-0.139	-0.178	-0.566	0.013	-0.105*	0.009	-0.087
innovation	[0.142]	[0.097]	[0.141]	[0.074]	[0.025]	[0.102]	[0.000]	[0.000]	[0.000]	[0.054]	[0.031]	[0.067]

Note: The three different dependent variables of the specifications comprise dummy=1 if the firm's revenues increased due to innovation, dummy=1 if the firm's product price decreased due to innovation, and dummy=1 if the firm's cost decreased due to innovation. The main independent variable is dummy=1 if the firm decides to innovate. Other independent variables comprise the firm's characteristics such as the firm's age, age squared, number of workers employed by the firm, dummy=1 if the firm exports, dummy=1 if the firm has diversified products, dummy=1 if the firm makes the technology, dummy=1 if the firm buys the technology (keeping does not invest in technology), dummy=1 if the firm is publicly owned, dummy=1 if the firm is private limited, dummy=1 if the firm is family owned (keeping proprietorship as base category). District-fixed effects and sector-fixed effects for textile, surgical, light engineering, and automobile are controlled by the specifications. Time-fixed effects for years 2018, 2019, 2020, and 2021 are also controlled.

Robust standard errors in brackets are clustered at a firm level.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 9: Measuring the Impact of the Type of Innovation on the Light Engineering Sector's Performance

Light engineering Sector			
Types of Innovation	Revenues	Price	Cost
Any innovation	-0.215	-0.006	0.560
	[0.256]	[0.284]	[0.356]
Business Modelling Innovation	-0.036	0.099	-0.122
	[0.068]	[0.127]	[0.136]
Product Innovation	0.271	0.329	0.323
	[0.510]	[0.515]	[0.697]
Process Innovation	-0.101**	0.081	-0.242***
	[0.047]	[0.169]	[0.064]
Technological innovation	1.983	9.119	4.325
	[4.263]	[5.675]	[6.462]
Marketing innovation	-0.105**	0.072	-0.243***
	[0.048]	[0.173]	[0.064]

Note: The three different dependent variables of the specifications comprise dummy=1 if the firm's revenues increased due to innovation, dummy=1 if the firm's product price decreased due to innovation, and dummy=1 if the firm's cost decreased due to innovation. The primary independent variable is dummy=1 if the firm decides to innovate. Other independent variables comprise the firm's characteristics such as firm's age, age squared, number of workers employed by firm, dummy=1 if the firm exports, dummy=1 if the firm has diversified products, dummy=1 if the firm makes the technology, dummy=1 if the firm buys the technology (keeping does not invest in technology), dummy=1 if the firm is publicly owned, dummy=1 if the firm is private limited, dummy=1 if the firm

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is family owned (keeping proprietorship as base category). The specifications control district and sector-fixed effects for textile, surgical, light engineering, and automobile. Time-fixed effects for years 2018, 2019, 2020, and 2021 are also controlled.

Robust standard errors in brackets are clustered at a firm level.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 10: Measuring the Impact of Type of Innovation on the Light Engineering Sector's Performance by Age & Size

VARIABLES	Light Engineering											
	small			big			young			old		
	Revenues	Price	Cost	Revenues	Price	Cost	Revenues	Price	Cost	Revenues	Price	Cost
Any innovation	-3.484 [1.0.919]	-2.097*** [.408]	1.6633** [6.620]	1.84 [1.014]	-1.37 [8.9]	6.3 [14.326]	4.72 [8.670]	-1.235 [11.15]	11.42 [8.698]	-0.080 [0.329]	0.325 [0.364]	0.392 [0.417]
Business Modelling Innovation	-0.010 [0.119]	0.237 [0.155]	-0.220* [0.112]	0.115 [0.093]	0.131 [0.101]	0.278 [0.176]	-0.103 [0.081]	0.430*** [0.063]	-0.134 [0.109]	-0.014 [0.065]	-0.032 [0.069]	-0.068 [0.188]
Product Innovation	1.196 [1.440]	0.712 [1.294]	0.427 [1.482]	-0.354 [0.545]	-0.490 [0.748]	0.866 [0.893]	2.3509* [1.924]	-4.066 [23.813]	10.125 [14.311]	0.165 [0.997]	-1.648 [1.012]	-0.139 [1.174]
Process Innovation	-0.001 [0.108]	0.193 [0.135]	-0.213** [0.093]	-3.686 [2.374]	-7.334** [3.060]	-5.777 [5.613]	-0.080 [0.070]	0.370*** [0.054]	-0.116 [0.090]	-0.087 [0.068]	-0.104 [0.078]	-0.309*** [0.112]
Technological innovation	0.827 [6.710]	12.382 [8.050]	-1.499 [10.026]	9.061 [10.768]	27.030* [13.722]	20.422 [15.329]	-4.340 [16.951]	-19.564 [24.271]	-44.159*** [12.920]	4.336 [5.261]	9.289 [6.433]	11.472 [8.157]
Marketing innovation	-0.003 [0.110]	0.188 [0.143]	-0.220** [0.096]	0.035 [2.113]	-2.584 [3.322]	0.809 [4.318]	-0.092 [0.072]	0.372*** [0.054]	-0.128 [0.093]	-0.089 [0.067]	-0.109 [0.075]	-0.295*** [0.112]

Note: The three different dependent variables of the specifications comprise dummy=1 if the firm's revenues increased due to innovation, dummy=1 if the firm's product price decreased due to innovation, and dummy=1 if the firm's cost decreased due to innovation. The main independent variable is dummy=1 if the firm decides to innovate. Other independent variables comprise the firm's characteristics such as firm's age, age squared, number of workers employed by firm, dummy=1 if the firm exports, dummy=1 if the firm has diversified products, dummy=1 if the firm makes the technology, dummy=1 if the firm buys the technology (keeping does not invest in technology), dummy=1 if the firm is publicly owned, dummy=1 if the firm is private limited, dummy=1 if the firm is family owned (keeping proprietorship as base category). The specifications control district-fixed effects for textile, surgical, light engineering, and automobile are controlled by the years 2018, 2019, 2020, and 2021 are also controlled.

Robust standard errors in brackets are clustered at a firm level.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 11: Measuring the Impact of Type of Innovation on The Light Engineering Sector's Performance for Exporters & Non-exporters

Types of Innovation	Light engineering Sector					
	exporter			Non-exporters		
	Revenues	Price	Cost	Revenues	Price	Cost
Any innovation	-0.109 [0.688]	0.082 [0.695]	1.163 [0.756]	-0.197 [0.358]	0.029 [0.389]	0.286 [0.493]
Business Modelling Innovation	-0.131 [0.089]	0.293** [0.106]	-0.106 [0.196]	-0.096 [0.063]	-0.150* [0.086]	-0.344*** [0.108]
Product Innovation	0.593 [1.142]	0.084 [1.074]	-1.730 [1.390]	0.168 [0.575]	0.579 [0.628]	1.076 [0.743]
Process Innovation	-0.126 [0.080]	0.315*** [0.070]	-0.214** [0.096]	-0.040 [0.067]	-0.185** [0.089]	-0.355*** [0.103]
Technological innovation	-19.219 [23.318]	50.591 [34.291]	45.270 [44.788]	-0.975 [4.924]	5.103 [6.137]	3.942 [8.052]
Marketing innovation	-0.137 [0.085]	0.321*** [0.075]	-0.209** [0.101]	-0.057 [0.064]	-0.199** [0.088]	-0.357*** [0.102]

Note: The three different dependent variables of the specifications comprise dummy=1 if the firm's revenues increased due to innovation, dummy=1 if the firm's product price decreased due to innovation, and dummy=1 if the firm's cost decreased due to innovation. The primary independent variable is dummy=1 if the firm decides to innovate. Other independent variables comprise the firm's characteristics such as firm's age, age squared, number of workers employed by firm, dummy=1 if the firm exports, dummy=1 if the firm has diversified products, dummy=1 if the firm makes the technology, dummy=1 if the firm buys the technology (keeping does not invest in technology), dummy=1 if the firm is publicly owned, dummy=1 if the firm is private limited, dummy=1 if the firm is family owned (keeping proprietorship as base category): the specifications control district and sector-fixed effects for textile, surgical, light engineering, and automobile. Time-fixed effects for years 2018, 2019, 2020, and 2021 are also controlled.

Robust standard errors in brackets are clustered at a firm level.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 12: Measuring the Impact of Innovation Complementarities on the Light Engineering Sector's Performance

Light engineering Sector			
Complimentary innovation	Revenues	Price	Cost
bus_market	[0.101] 0.110	[0.211] -0.313	[0.151] -0.424
bus_prod	-0.045 [0.197]	-0.027 [0.209]	-0.155 [0.218]
proc_bus	1.301* [0.715]	-0.125 [0.769]	2.628** [1.109]
process_market	0.781 [1.300]	-1.914 [1.525]	0.468 [1.866]
process_tech	0.172 [0.257]	2.297*** [0.320]	0.449 [0.408]
prod_market	0.047 [0.109]	-0.546*** [0.202]	0.111 [0.172]
prod_proc	-0.031 [0.093]	-0.843*** [0.122]	-0.14 [0.155]
prod_tech	1.029 [3.237]	7.640** [3.271]	4.611 [3.466]
tech_market	-0.035 [0.293]	1.466*** [0.550]	-0.231 [0.458]
bus_tech	0.200 [0.523]	0.102 [0.562]	0.373 [0.580]

Note: The three different dependent variables of the specifications comprise dummy=1 if the firm's revenues increased due to innovation, dummy=1 if the firm's product price decreased due to innovation, and dummy=1 if the firm's cost decreased due to innovation. The primary independent variable is dummy=1 if the firm decides to innovate. Other independent variables comprise the firm's characteristics such as firm's age, age squared, number of workers employed by firm, dummy=1 if the firm exports, dummy=1 if the firm has diversified products, dummy=1 if the firm makes the technology, dummy=1 if the firm buys the technology (keeping does not invest in technology), dummy=1 if the firm is publicly owned, dummy=1 if the firm is private limited, dummy=1 if the firm is family owned (keeping proprietorship as base category). District-fixed effects and sector-fixed effects for textile, surgical, light engineering, and automobile are controlled in the specification. Time-fixed effects for years 2018, 2019, 2020, and 2021 are also controlled.

Robust standard errors in brackets are clustered at a firm level.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 13: Measuring the impact of Innovation Complementarities on the Light Engineering Sector's Performance for Exporters & Non-exporters

	Light engineering Sector					
	Exporters			Non-exporter		
	Revenues	Price	Cost	Revenues	Price	Cost
bus_market	-1.516 [1.443]	-1.005 [1.656]	1.072 [1.600]	0.082 [0.506]	-0.496 [0.575]	-0.136 [0.713]
bus_prod	0.154 [0.405]	0.028 [0.595]	0.419 [0.755]	-0.299 [0.237]	0.299 [0.274]	0.079 [0.324]
proc_bus	1.267 [1.733]	1.163 [1.925]	4.686* [2.689]	1.390 [1.172]	-1.731 [1.195]	2.818 [1.728]
process_market	-0.839 [2.214]	-1.463 [1.837]	6.430* [3.134]	1.001 [2.678]	-3.356 [3.190]	-4.641* [2.705]
process_tech	-15.470 [12.050]	-9.562 [12.527]	2.841 [33.360]	22.211 [14.173]	16.113 [17.077]	34.501** [15.781]
prod_market	11.926* [6.077]	5.320 [8.141]	11.975 [7.603]	0.691 [2.966]	9.530*** [2.229]	3.094 [2.551]
prod_proc				-8.861* [5.175]	-5.407 [6.964]	-11.263 [6.986]
prod_tech	8.476 [7.148]	-0.063 [7.053]	8.446 [8.235]	-0.352 [4.216]	11.898*** [4.021]	3.701 [4.084]
tech_market	-32.122* [15.598]	-13.510 [22.074]	-27.089 [20.203]	-1.197 [7.691]	-25.046*** [5.413]	-8.251 [6.313]
bus_tech	-0.266 [1.083]	0.148 [1.390]	-1.096 [1.826]	0.864 [0.648]	-0.700 [0.685]	0.058 [0.734]

Note: The three different dependent variables of the specifications comprise dummy=1 if the firm's revenues increased due to innovation, dummy=1 if the firm's product price decreased due to innovation, and dummy=1 if the firm's cost decreased due to innovation. The primary independent variable is dummy=1 if the firm decides to innovate. Other independent variables comprise the firm's characteristics such as the firm's age, age squared, number of workers employed by firm, dummy=1 if the firm exports, dummy=1 if the firm has diversified products, dummy=1 if the firm makes the technology, dummy=1 if the firm buys the technology (keeping does not invest in technology), dummy=1 if the firm is publicly owned, dummy=1 if the firm is private limited, dummy=1 if the firm is family owned (keeping proprietorship as base category). The specifications control district and sector-fixed effects for textile, surgical, light engineering, and automobile. Time-fixed effects for years 2018, 2019, 2020, and 2021 are also controlled.

Robust standard errors in brackets are clustered at a firm level.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

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Table 14: Measuring the Impact of Type of Innovation on The Automotive Sector's Performance

Automotive Sector			
	Revenue	Price	Cost
Any innovation	-0.058 [0.585]	0.024 [0.499]	-0.324 [0.610]
Business Modelling Innovation	0.062 [0.104]	0.038 [0.059]	-0.140* [0.080]
Product Innovation	14.741*** [5.527]	-1.849 [2.506]	-4.526 [4.375]
Process Innovation	-2.088* [1.222]	-0.666 [1.101]	-0.539 [1.292]
Technological innovation	42.948 [38.364]	-18.918 [26.004]	17.938 [41.800]
Marketing innovation	0.817* [0.425]	0.682** [0.281]	-0.059 [0.483]

Table 15: Measuring the Impact of Type of Innovation on The Automotive Sector's Performance by Age & Size

Automotive Industry												
	small			big			Young			Old		
	Revenues	Price	Cost	Revenues	Price	Cost	Revenues	Price	Cost	Revenues	Price	Cost
Any innovation	2.420*** [0.780]	1.113 [0.993]	2.200** [1.019]	-0.053 [0.398]	-0.273 [0.289]	-1.155*** [0.319]	1.852 [1.279]	0.471 [1.671]	-1.752 [1.402]	-1.257* [0.660]	-0.335 [0.901]	0.156 [0.966]
Business Modelling Innovation	-2.887*** [0.773]	-0.847 [0.929]	-1.901* [0.996]	0.102 [0.126]	0.077 [0.084]	-0.151 [0.102]	0.103 [0.211]	0.112 [0.203]	0.188 [0.274]	0.193 [0.137]	0.068 [0.086]	-0.157 [0.121]
Product Innovation	2.788*** [0.898]	1.282 [1.144]	2.534** [1.174]	20.515*** [4.937]	-2.231 [3.387]	-2.783 [5.844]	6.907 [5.347]	0.768 [4.141]	-0.619 [3.011]	13.654* [6.827]	-0.388 [3.076]	-3.892 [6.621]
Process Innovation	-13.945*** [4.570]	-2.774 [4.500]	-22.08*** [1.658]	-2.536* [1.426]	-0.585 [1.198]	0.628 [1.403]	-8.926 [5.322]	-4.396 [4.238]	-20.281*** [2.908]	-4.189*** [1.092]	-1.126 [1.510]	0.435 [1.699]
Technological innovation	160.778*** [55.845]	62.066 [59.880]	301.6*** [16.712]	44.468 [37.535]	-28.810 [32.947]	3.592 [45.872]	69.401 [48.235]	10.101 [30.249]	92.686 [70.888]	5.813 [53.175]	-80.205 [51.717]	74.480 [64.588]
Marketing innovation	-22.333*** [7.341]	-7.736 [7.831]	-40.7*** [2.294]	0.710 [0.576]	0.708* [0.381]	-0.022 [0.602]	-10.325 [12.773]	4.043 [11.089]	-12.195 [19.277]	0.837* [0.457]	0.675** [0.333]	-0.099 [0.550]

Note: The three different dependent variables of the specifications comprise dummy=1 if the firm's revenues increased due to innovation, dummy=1 if the firm's product price decreased due to innovation, and dummy=1 if the firm's cost decreased due to innovation. The primary independent variable is dummy=1 if the firm decides to innovate. Other independent variables comprise the firm's characteristics such as firm's age, age squared, number of workers employed by firm, dummy=1 if the firm exports, dummy=1 if the firm has diversified products, dummy=1 if the firm makes the technology, dummy=1 if the firm buys the technology (keeping does not invest in technology), dummy=1 if the firm is publicly owned, dummy=1 if the firm is private limited, dummy=1 if the firm is family owned (keeping proprietorship as base category): the specifications control district and sector-fixed effects for textile, surgical, light engineering, and automobile. Time-fixed effects for years 2018, 2019, 2020, and 2021 are also controlled.

Robust standard errors in brackets are clustered at a firm level.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 16: Measuring the Impact of Type of Innovation on The Light Engineering Sector's Performance for Exporters & Non-exporters

VARIABLES	Automotive Sector					
	exporter			Non-exporters		
	Revenues	Price	Cost	Revenues	Price	Cost
Any innovation	-1.077 [1.764]	-2.586*** [0.123]	-0.361 [1.257]	-0.332 [0.821]	-0.116 [0.780]	-0.426 [0.842]
Business Modelling Innovation	0.396* [0.207]	0.144 [0.318]	-0.229 [0.297]	-0.190 [0.169]	-0.066 [0.068]	-0.151 [0.140]
Product Innovation	41.215 [39.982]	24.657 [38.075]	31.197 [25.794]	-0.329** [0.146]	-0.175 [0.124]	-0.451*** [0.122]
Process Innovation	-3.841 [5.245]	-2.601 [2.096]	1.688 [4.843]	-1.455 [1.811]	0.135 [1.684]	-1.508 [2.278]
Technological innovation	172.744 [947.275]	-263.765 [346.318]	-246.995 [549.010]	22.805 [51.747]	-49.810 [41.408]	60.662 [52.515]
Marketing innovation	1.363 [1.956]	1.046* [0.595]	-0.544 [1.722]	-1.065 [1.548]	0.281 [1.376]	-0.115 [1.187]

Note: The three dependent variables of the specifications comprise dummy=1 if the firm's revenues increased due to innovation, dummy=1 if the firm's product price decreased due to innovation dummy=1 if the firm's cost decreased due to innovation. The primary independent variable is dummy=1 if the firm decides to innovate. Other independent variables comprise characteristics such as the firm's age, age squared, number of workers employed by the firm, dummy=1 if the firm exports, dummy=1 if the firm has diversified products, dummy=1 if the firm makes the technology, dummy=1 if the firm buys the technology (keeping does not invest in technology), dummy=1 if the firm is publicly owned, dummy=1 if the firm is private limited, dummy=1 if the firm is family owned (keeping proprietorship as base category). District-fixed fixed effects and sector-fixed effects for textile, surgical, light engineering, and automobile are controlled by the specifications. Time-fixed effects for years 2018, 2019, 2020, and 2021 are also controlled.

Robust standard errors in brackets are clustered at firm level.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 17: Measuring the Impact of Innovation Complementarities on the Automotive Sector's Performance

	Automotive Sector		
	Revenues	Price	Cost
bus_market	0.232*** [0.066]	0.073 [0.063]	0.199** [0.075]
bus_prod	0.04 [0.066]	0.043 [0.037]	0.035 [0.068]
proc_bus	0.246*** [0.058]	0.092 [0.056]	0.184** [0.073]
process_market	-0.068 [0.138]	0.092 [0.073]	0.016 [0.097]
process_tech	0.137 [0.192]	0.114 [0.103]	0.480*** [0.140]
prod_market	0.054 [0.057]	0.025 [0.028]	0.007 [0.068]
prod_proc	0.031 [0.086]	0.017 [0.045]	-0.075 [0.098]
prod_tech	0.088 [0.117]	0.130 [0.084]	0.284** [0.121]
tech_market	0.051 [0.129]	0.085 [0.075]	0.403*** [0.115]
bus_tech	-0.270** [0.112]	-0.027 [0.088]	-0.027 [0.159]

Note: The three dependent variables of the specifications comprise dummy=1 if the firm's revenues increased due to innovation, dummy=1 if the firm's product price decreased due to innovation and dummy=1 if the firm's cost decreased due to innovation. The primary independent variable is dummy=1 if the firm decides to innovate. Other independent variables comprise the firm's characteristics such as the firm's age, age squared, number of workers employed by the firm, dummy=1 if the firm exports, dummy=1 if the firm has diversified products, dummy=1 if the firm makes the technology, dummy=1 if the firm buys the technology (keeping does not invest in technology), dummy=1 if the firm is publicly owned, dummy=1 if the firm is private limited, dummy=1 if the firm is family owned (keeping proprietorship as base category). District-fixed effects and sector-fixed effects for textile, surgical, light engineering, and automobile are controlled by the specifications. Time fixed effects for years 2018, 2019, 20,20, and 2021 are also controlled.

Robust standard errors in brackets are clustered at firm level.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 18: Measuring the impact of Innovation Complementarities on the Light Engineering Sector's Performance for Exporters & Non-exporters

	Automotive Sector					
	Exporters			Non-exporters		
	Revenues	Price	Cost	Revenues	Price	Cost
bus_market	-0.001 [0.030]	-0.040 [0.146]	0.156 [0.386]	0.197 [0.129]	0.049 [0.086]	0.119 [0.114]
bus_prod	-0.692 [0.460]	0.515 [0.562]	0.550 [1.971]	0.015 [0.048]	0.014 [0.030]	0.022 [0.060]
proc_bus	0.261 [0.254]	-0.137 [0.213]	0.091 [0.690]	0.199* [0.102]	0.055 [0.083]	0.134 [0.113]
process_market	0.183 [0.853]	-0.087 [0.329]	0.522 [0.713]	-0.261** [0.122]	0.060 [0.070]	0.082 [0.112]
process_tech	2.256 [1.747]	1.863* [0.961]	0.338 [2.778]	-0.262 [0.164]	0.094 [0.120]	0.479*** [0.151]
prod_market	-3.122 [3.219]	-2.299** [0.805]	-3.279 [3.227]	0.087 [0.052]	0.014 [0.023]	0.016 [0.038]
prod_proc	4.200 [9.199]	-0.998 [5.144]	1.000 [7.786]	0.120 [0.078]	0.011 [0.051]	-0.031 [0.067]
prod_tech	-5.060 [16.674]	-9.321 [11.238]	2.823 [18.074]	0.077 [0.218]	0.105 [0.103]	0.106 [0.165]
tech_market	-1.766* [0.937]	-1.080*** [0.374]	-1.098 [1.344]	-0.249 [0.169]	0.081 [0.080]	0.363*** [0.123]
bus_tech	-0.548*** [0.099]	-0.116 [0.320]	-0.191 [0.759]	-0.356*** [0.109]	-0.041 [0.091]	-0.012 [0.162]

Note: The three dependent variables of the specifications comprise dummy=1 if the firm's revenues increased due to innovation, dummy=1 if the firm's product price decreased due to innovation and dummy=1 if the firm's cost decreased due to innovation. The primary independent variable is dummy=1 if the firm decides to innovate. Other independent variables comprise the firm's characteristics such as firm's age, age squared, number of workers employed by firm, dummy=1 if the firm exports, dummy=1 if the firm has diversified products, dummy=1 if the firm makes the technology, dummy=1 if the firm buys the technology (keeping does not invest in technology), dummy=1 if the firm is publicly owned, dummy=1 if the firm is private limited, dummy=1 if the firm is family owned (keeping proprietorship as base category). The specifications control district and sector-fixed effects for textile, surgical, light engineering, and automobile. Time-fixed effects for years 2018, 2019, 2020, and 2021 are also controlled.

Robust standard errors in brackets are clustered at firm level.

*** p<0.01, ** p<0.05, * p<0.1

7

Keynes's Revenge: An Essay on the Dichotomy between Savings and Investment in Pakistan

Moazam Mahmood¹, Shamyla Chaudry² and Muzzna Maqsood³

Abstract

Pakistan's economy may have lost its high growth rate of 6%, driven by investment and now plods at 4%, switching to consumption as its driver of growth. The earlier 6% growth was driven by investment, whereas the latter 4% growth has been majorly consumption led. Consequently, the era of investment-led growth appears to be over, possibly irreversibly. As a result, consumption-led growth is now necessary. For this to be effective, consumption must be high for the consumption multiplier to work. Despite this, there is a persistent misconception that high investment is required, which necessitates a high savings rate. Pakistan's savings rate—approximately 12% of GDP—is comparable to that of Sub-Saharan Africa, prompting a search for alternative estimates beyond the SBP's reported 12%. Our findings indicate that savings are significantly higher than the 12% estimate; however, these domestic savings are not utilized for domestic investment due to outflows. This phenomenon can be interpreted as Keynes's revenge. Not only are savings a leakage from the aggregate demand within the domestic economy—consistent with the Keynesian model of the paradox of thrift—but also a leakage out of the domestic economy as outflows. As a result, they are lost to both domestic savings and domestic investment. To address this issue, we propose implementing a market mechanism to reduce these outflows of domestic savings.

Introduction

Isaiah Berlin's 1953 essay on the Greek parable of the "Hedgehog and the fox" is an apt metaphor for our neighborhood's economies.

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'The fox knows many things, but the hedgehog knows one big thing.'

Isaiah Berlin (1953)

Isaiah Berlin states that hedgehogs are thinkers who relate everything to a single central vision or system in terms of which they comprehend, think and feel. In contrast, foxes chase many ends that are often unrelated and even opposing.

Pakistan's growth rate has declined over the past three decades, shifting from over 6% per annum in the 1960s, 1970s, and 1980s—driven by investment—to just above 4% per annum from around 1990 onwards, driven by consumption (Ikram and Mahmood, 2022).

Earlier, Pakistan's 6% growth was driven by investment, whereas the latter 4% growth has been driven by consumption. Therefore, the days of investment-led growth are gone, perhaps irretrievably. Now, we need consumption-led growth, not investment-led growth. Consequently, we need consumption to be very high for the consumption multiplier to work. However, we persist in the misconception of needing high investment I , which requires a high savings rate S . We lament a Sub-Saharan African savings rate in Pakistan of approximately 12% of GDP.

The consequence of consumption-led growth C , is that consumption should be high, and therefore savings S , should be low. This aligns with John Maynard Keynes's model, where savings S is lost to aggregate demand Y , subsequently lowering output and growth. Therefore, instead of lamenting Pakistan's low-savings rate S , comparable to those in Sub-Saharan Africa, we should recognize the benefits of high consumption C and low savings S in the context of consumption-led growth.

We sought an estimate of savings S , beyond the SBP's 12% of GDP. Our findings indicate that savings are significantly higher than this estimate. These domestic savings S_{dom} , however are lost to domestic investment I_{dom} , due to outflows from domestic savings S_{out} . We estimate that approximately Rs 1.4 trillion (approximately \$8 billion) of domestic savings are diverted into outflows.

This calculation reveals that domestic savings are subject to a double leakage: Outflows are lost to domestic investment and also depress consumption. This phenomenon can be seen as Keynes's revenge, where Pakistan's growth cannot be driven either by investment or consumption, unless these outflows of savings are discouraged.

The remainder of the study is structured as follows: Section 2 sets out a conceptual framework to estimate savings in Pakistan; Section 3 Estimates equations for FY 2022 using this conceptual framework. Section 4 outlines the

Estimation of Outflows. Section 5 presents the estimation results and Section 6 concludes the paper.

2. A conceptual framework to estimate savings in Pakistan

A fundamental macroeconomic accounting identity posits that savings S , equal investment I , where savings are defined as income minus spending, and investment refers to physical investment, not financial investment. The identity stems from the national income equals national product identity. However, estimates from the Lahore School model indicate that investment stands at 16% of GDP (Mahmood et al., 2022) while the savings rate is estimated at 12% (SBP, 2023). This discrepancy between savings and investment highlights a dichotomy that warrants a comprehensive conceptual framework to explore in detail.

A macroeconomic framework can be employed to examine the dichotomy between savings and investment. This framework posits that the gap between domestic investment and domestic savings must be offset by a current account CA deficit. The following conceptual framework, comprising six key equations, elucidates the relationships underlying the deviation between savings and investment. Specifically, equation 7.1 states that the difference between investment I and aggregate saving S , is equal to current account CA .

$$I - S = CA \quad (7.1)$$

Aggregate saving S , comprise public savings S_{pub} , and private savings S_{priv} .

$$S = S_{pub} + S_{priv} \quad (7.2)$$

Public savings S_{pub} is the difference between taxation T and government expenditure G

$$S_{pub} = T - G \quad (7.3)$$

Private savings S_{priv} are given by output Y minus consumption C and taxation T .

$$S_{priv} = Y - C - T \quad (7.4)$$

Substituting equation 7.2 into equation 7.1 yields an expanded form where investment I minus the sum of public savings S_{pub} and private savings S_{priv} equals the current account CA .

$$I - (S_{pub} + S_{priv}) = CA \quad (7.5)$$

By expanding equation 7.5 further through substitution of equations 7.3 and 7.4, we get an expression where investment I minus the expanded term for public savings S_{pub} , which is taxation T minus government expenditure G and minus the expanded term for private savings S_{priv} , which is output Y minus consumption C minus taxation T , equals the current account CA .

$$I - \{(T-G) + (Y - C - T)\} = CA \quad (7.6)$$

This serves as a workhouse conceptual framework for estimating savings, assuming that all private savings S_{priv} , after accounting for consumption and disposable income $Y - T$, are available for domestic investment I .

However, the argument we wish to make is that not all domestic savings are available for domestic investment. Specifically, four components of domestic savings are not accessible for domestic investment: capital outflows, savings in foreign exchange, savings in gold, and savings in precious stones.

When capital flows out of the country, it is theoretically considered part of national savings but cannot be utilized for domestic investment purposes. Consequently, capital outflows reduce the proportion of private savings available for domestic investment.

Exchange rate volatility can lead individuals to hold their savings in foreign currency as cash instead rather than depositing into bank accounts. However, these foreign currency savings are not available for domestic investment purposes and do not contribute to the capital stock. Consequently, this can reduce the amount of private savings available for domestic investment in the economy.

Individuals may hold their savings in the form of precious metals and stones, which cannot be used for capital formation. These savings in high-value commodities are often not accounted for in estimates of private savings, thereby reducing the quantum of private savings available for domestic investment. Furthermore, the presence of a significant informal economy can lead to an underestimation of GNP, as well as the savings and investment, required to produce this GNP. Therefore, the share of the informal economy tends to reduce the estimated savings, reducing the funds available for investment.

This gives us an expanded equation (7), as:

$$I - (S_{pub} + S_{priv}) = (CA) + (a + b + c + d) \quad (7.7)$$

where;

(a) = Capital outflows from the country

(b) = Savings in foreign currency

(c) = Savings in the form of precious metals and stones

(d) = Informal economy

Where the investment minus saving gap $I - S$ is now equal to the current account plus capital outflows ($CA + K$), savings in foreign exchange, savings in precious metals and the impact of the informal economy. Gross National Disposable Income ($GNDI$) will be used for output Y , where $GNDI$ is equal to Gross National Income (GNI), minus current money transfers of outward remittance OR , plus total inward remittances IR to the country.

Therefore,

$$GNDI = GNI - OR + IR$$

3. Estimating these equations from our conceptual framework for FY 2022

Using observed data for FY 2022 from Pakistan, we first estimate equation 7.1.

$$I - S = CA \quad (7.1)$$

Pakistan's investment for FY 2022 is PKR 9,334 billion.

$$9,334 - S = CA$$

From equations 7.2,

$$S = S_{\text{pub}} + S_{\text{priv}} \quad (7.2)$$

and 7.3,

$$S_{\text{pub}} = T - G \quad (7.3)$$

$$\begin{aligned} S_{\text{pub}} &= 8,035.4 - 13,295.3 \\ &= -5,260 \text{ bn} \end{aligned}$$

Therefore, the public sector experiences dissaving of PKR 5,260 billion.

From equation 7.4,

$$\begin{aligned} S_{\text{priv}} &= Y - C - T \\ &= 9,796.3 \end{aligned} \quad (7.4)$$

Therefore, the private sector saves to partially compensate for the dissaving of the public sector, giving aggregate savings (S)

$$S = -5,260 + 9,796.3$$

$$S = 4,536.3 \text{ bn}$$

Putting this estimate of investment and savings into equation 7.6, gives an investment savings gap $I - S$ of:

$$9,334 - 4,536.3 = CA \quad (7.6)$$

$$CA = 4,797.7$$

This gives an estimated current account CA of PKR 4,797.7 billion. However, the observed CA is PKR 3,102 billion. Therefore, according to equation 7.6, the $I - S$ gap should be smaller, equaling PKR 3,102 billion. This implies that savings should be higher than that given by equation 7.6. The difference between our estimated CA given by the $I - S$ gap and the observed CA is PKR 1,695.7 billion.

This difference is not well explained by equation 7.6. Therefore, we use equation 7.7 to explain this.

$$I - (S_{\text{pub}} + S_{\text{priv}}) = (CA) + (a + b + c + d) \quad (7.7)$$

Table 1 estimates the investment-saving gap for FY 2022.

Table 1: Investment-Saving Gap FY 2022

Symbol	Indicator	2022 (PKR Billion)
I	Total Investment	9,334
S_{pub}	Public Saving ($T - G$)	-5,260
Y	GNDI	71,487
C	Consumption (private)	57,122
T	Taxes (current prices)	4,568
S_{priv}	Private Saving ($Y - C - T$)	9,796
S	National Saving ($S_{\text{pub}} + S_{\text{priv}}$)	4,536
$I - S$	Investment and Saving Gap	4,797
CA_{obs}	Observed Current Account deficit	3,102
$(I - S) - CA_{\text{obs}}$	$I - S$ gap and the observed CA gap	1,695

4. Estimation of Capital Outflows

The key variable to be estimated from the capital account KA is capital outflows, which are theorised to comprise four major components (Mahmood & Chaudry, 2020). These components are derived from the SBP's accounting framework for the Current Account CA and Capital Accounts KA.

The central argument for conceptualising capital outflows, based on our earlier work, posits that these outflows are determined by domestic profitability relative to foreign profitability (Mahmood & Chaudry, 2020). Specifically, if domestic profitability declines relative to foreign profitability, capital outflows are likely to increase. Conversely, if domestic profitability rises relative to foreign profitability, capital outflows are likely to decrease.

Therefore, the definition of capital outflows must commence with domestic outflows for foreign investment, which are primarily derived from the KA side. Additionally, a strong case can be made for including capital outflows from the CA side, specifically the repatriation of yields from foreign-held domestic assets (Mahmood & Chaudry, 2020). This results in four major components identified from the SBP's accounting framework:

Total net outflows from Pakistan are equal to the sum of direct investment abroad, portfolio investment abroad, net incurrence of assets and net outflows of primary income from the CA (primary income balance), where the sum of direct investment abroad, portfolio investment abroad and net incurrence of assets equals the net outflows from financial accounts (FA).

Table 2 below estimates the net outflows from FY 1990 to FY 2022 using this equation as specified in Mahmood & Chaudry (2020).

Table 2: Total net outflows FY 1990 - FY 2022(US\$ million)

Year	Direct Investment abroad (A)	Portfolio investment abroad (B)	Net acquisition of financial assets (C)	Net outflows from FA D=A+B+C	Net outflows from CA (Primary income) (E)	Total Net Outflows (D+E)
1990	12	0	-272	-260	878	618
1991	7	0	-448	-441	941	500
1992	8	0	-291	-283	1,123	840
1993	-4	0	-702	-706	1,389	683
1994	-6	0	-181	-187	1,447	1,260
1995	3	0	-140	-137	1,359	1,222
1996	-4	0	140	136	1,804	1,940
1997	-18	0	64	46	2,203	2,249
1998	29	0	-367	-338	2,188	1,850
1999	44	0	-34	10	1,803	1,813
2000	-1	549	-449	99	1,972	2,071

Year	Direct Investment abroad (A)	Portfolio investment abroad (B)	Net acquisition of financial assets (C)	Net outflows from FA D=A+B+C	Net outflows from CA (Primary income) (E)	Total Net Outflows (D+E)
2001	37	140	-291	-114	2,203	2,089
2002	2	491	236	729	2,207	2,936
2003	27	0	434	461	2,211	2,672
2004	45	-3	-546	-504	2,207	1,703
2005	66	-11	-1,235	-1180	2,386	1,206
2006	71	-22	-209	-160	2,667	2,507
2007	114	5	-758	-639	3,582	2,943
2008	75	5	32	112	3,923	4,035
2009	25	1,073	560	1,658	4,407	6,065
2010	76	65	-11	130	3,282	3,412
2011	44	7	-920	-869	3,017	2,148
2012	77	32	-9	100	3,245	3,345
2013	198	99	314	611	3,669	4,280
2014	128	-23	-211	-106	3,955	3,849
2015	73	-41	-71	-39	4,599	4,560
2016	19	100	96	215	5,347	5,562
2017	86	-1	1,180	1,265	5,048	6,313
2018	10	-48	210	172	5,282	5,454
2019	-74	-144	-67	-285	5,610	5,325
2020	-54	-115	-127	-296	5,459	5,163
2021	171	-12	1,345	1,504	4,400	5,904
2022	234	-24	26,13	2,823	5,248	8,071

Source: Mahmood & Chaudry (2020)

Table 3: Total Net outflows FY 2022 (US\$ million)

Direct Investment Abroad (A)	Portfolio investment abroad (B)	Net acquisition of financial assets (C)	Net outflows from FA D=A+B+C	Net outflows from CA (Primary income) (E)	Total Net Outflows (D+E)
234	-24	2,613	2,823	5,248	8,071

Source: Mahmood & Chaudry (2020)

This gives us the following equation:

$$\text{Total Net outflows} = \text{Net outflows from Financial Account} + \text{Net outflows from CA} \quad (7.8)$$

where,

$$\text{Net outflows from FA} = \text{Direct Investment abroad} + \text{Portfolio investment abroad} + \text{Net acquisition of financial assets} \quad (7.9)$$

The net outflows for FY 2022 are given in Table 3 where the total net outflow of US\$ 8,071 million approximately equals PKR 1,651 billion.

5. Estimated vs. Observed Gap

We will use our new conceptual framework of saving and investment combined with the conceptual framework by Mahmood & Chaudry (2020) for outflows. We incorporate total net outflows in our mum equation to approximate it to our observed CA of PKR 3,102 billion.

Therefore,

$$I - S - (\text{Total net outflow}) = CA \quad (7.10)$$

$$4,797.7 - 1,651.5 = 3,146.3$$

This is approximately equal to Pakistan's current account balance of PKR 3,102 billion for FY 2022.

The difference between the observed gap PKR 3,102 billion and the gap estimated by our equation PKR 3,146.2 billion equals PKR 44.2 billion which can be explained by cash savings in foreign exchange, savings in the form of precious metals, and informal sectors.

Private savings have been captured in Equation 7.1, where the $I - S$ gap is equal to CA has to be based on equation 7.7, where private domestic savings are supplemented by capital flight and unmeasured variables in equation 7.7 (b to d).

So domestic savings, S_{dom} , are actually:

$$S_{dom} = (S_{pub} + S_{priv}) + S_{out} \quad (7.11)$$

$$5,221 = 4,536.3 + 1,651.5$$

Where PKR 1,651.5 billion outflows are savings lost to domestic investment and domestic consumption. This is referred to as Keynes's revenge. Policy must establish a market mechanism to reduce these outflows of domestic savings.

6. Conclusion

Savings are a leakage from aggregate demand in the domestic economy. This invokes the Keynesian (1936) model of the paradox of thrift, which posits that if all individuals collectively increase savings by cutting their spending, aggregate demand will fall, thereby reducing aggregate income. Consequently, savings will also decline, creating a paradox where increasing individual savings can result in decreased aggregate savings.

Our argument extends this concept by highlighting that savings, particularly those constituting capital outflows as observed in Pakistan, give a double whammy. First, savings reduce aggregate demand. Secondly, the component of savings constituting outflows from the domestic economy are also lost to domestic investment, which is referred to here as Keynes's revenge.

Encouraging savings in developing countries through fiscal policies can be a highly effective strategy to foster economic stability and growth. To retain domestic savings and control capital outflows, policymakers should implement a range of measures. These include capital controls, tax incentives for local savings, competitive interest rates, attractive domestic investment opportunities, strengthened local financial institutions, and promotion of financial literacy. Furthermore, streamlining regulatory processes for investments, supporting local enterprises, stabilizing the local currency, and promoting long-term savings plans will also contribute to retain savings within the country.

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8

Can Online Skilling Programs Foster Employment? Evidence from Punjab

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Abstract

In this study, we evaluate the impact of an online digital skills training program offered by the Punjab Skills Development Fund (PSDF) in collaboration with Coursera, aimed at providing international-standard online learning to its beneficiaries. The analysis focuses on four key questions: (i) How does the online training program impact employment and income generation? (ii) Did the program target vulnerable groups? (iii) Which courses were most effective in improving labor market outcomes? (iv) Should the program be continued in the future? The study combines administrative data from PSDF on 13,493 trainees who enrolled in the program with data from a phone survey of 685 trainees to collect detailed information on post-program outcomes. The findings reveal that transition-to-work rates are 10 percentage points higher amongst trainees who completed the course. Additionally, non-pecuniary benefits are observed, as course completion leads to trainees reporting significantly higher confidence levels and positive changes such as finding new or online jobs, receiving pay raise, completing or starting a degree, and enrolling in other training programs. The top five most effective courses for transition-to-work include Python for Everyone, Financial Accounting, Graphic Design, Developing Android Apps with App Inventor, and Digital Image & Video Processing. A cost-benefit indicates that the program is economically feasible, as average monthly income gains by trainees suggest that the program's cost per completion can be recovered in less than a year.

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Introduction

This paper assesses the impact of an online digital skills training program offered by the Punjab Skills Development Fund (PSDF). The program aims to help vulnerable youth secure sustainable employment and income-generating opportunities. This program is offered in collaboration with Coursera, the largest provider of Massive Open Online Courses (MOOCs), with 124 million subscribers worldwide. This partnership aims to deliver international-standard online learning to its beneficiaries. Eligible candidates enroll in one of the 22 courses hosted on Coursera. These courses are offered online by renowned universities worldwide and cover five streams: IT & software, digital marketing, finance, professional development and entrepreneurship. Trainees must pay an initial enrollment fee of PKR 2,000. After enrollment, they are eligible for a PKR 5,000 stipend and a certificate from the institute offering the course. This paper assesses the impact of an online digital skills training program offered by the Punjab Skills Development Fund (PSDF). The program aims to help vulnerable youth secure sustainable employment and income-generating opportunities. This program is offered in collaboration with Coursera, the largest provider of Massive Open Online Courses (MOOCs), with 124 million subscribers worldwide. This partnership aims to deliver international-standard online learning to its beneficiaries. Eligible candidates enroll in one of the 22 courses hosted on Coursera. These courses are offered online by renowned universities worldwide and cover five streams: IT & software, digital marketing, finance, professional development and entrepreneurship. Trainees must pay an initial enrollment fee of PKR 2,000. After enrollment, they are eligible for a PKR 5,000 stipend and a certificate from the institute offering the course. These are awarded upon successful completion of the course within three months. Since the program began in 2020, three cycles have been completed.

This report evaluates the program by addressing two questions: i) Who are the participants? ii) Are the participants in this digital skills training program finding employment generating income after graduation? To address the first question, the demographic profile of the participants is assessed, focusing on gender, age, education level and the region of origin. To answer the second question, the employment status, earnings and personal development of trainees are assessed by comparing outcomes for trainees who successfully complete the training with those who do not.

The analysis used two data sources: i) administrative data collected by PSDF on 13,493 trainees enrolled in the program, and ii) a phone survey of 685 trainees, from whom detailed data on post-program outcomes were collected. These sources were used because the administrative data provided a demographic profile of past trainees, while the survey data provided information on how trainees were using the skills they learned, allowing for analysis of the program's impact.

Our analysis reveals that transition-to-work rate was 10 percentage points higher amongst trainees who completed the course, and 7 percentage points higher among unemployed trainees who completed the course. trainees who complete the course also reported non-pecuniary benefits including significantly higher confidence levels and positive changes such as finding new or online jobs, receiving pay raises, completing or starting degrees, and participating in other training programs. Analysis by course indicated varying effectiveness, with the top 5 most effective courses for transition-to-work being Python for Everyone, Financial Accounting, Graphic Design, Developing Android Apps with App Inventor, and Digital Image & Video Processing.

A cost-benefit analysis was also conducted to assess the program's economic feasibility. Key findings from this analysis indicate that average monthly income gains from program completion are approximately PKR 23,100, which can offset the program cost (per- completion) in fewer than two months. Therefore, the cost per completion can be recovered in less than a year, making this a viable investment.

The remainder of this paper is organized as follows: Section 2 details the data and methodology used for the analysis. Section 3 presents results, including the demographic profile of participants, the pecuniary and non-pecuniary benefits of the program, insights for program administration, and the cost-benefit analysis. Section 4 provides the conclusion.

Data and Methodology

We evaluate the training program using two data sources: PSDF administrative data on all trainees who signed up for the program, and survey data from a smaller sample of enrolled trainees. This section describes these two data sources and explain the survey data collection approach.

Administrative data

PSDF collected background information and program status for all trainees who signed up for the training courses. The administrative data from 13,493 trainees were analyzed to provide insights into their profiles and progress in the program. Table 1 presents the sample size and basic demographics of trainees at different stages of the program. Of the trainees who registered, less than half were able to enroll in a course. Once enrolled, approximately one in every five trainees completed the program. Trainees are more likely to be males with Matric or Intermediate degrees from urban or developed areas. Nevertheless, a substantial proportion of trainees from marginalized groups (women, less educated, from rural or less developed areas) were present at each stage.

Table 1: Profile of Trainees

	Registered	Enrolled	Completed
Total Sample (Numbers)	13,493	5,090	1,151
Females %	20.3	22.8	21.6
Less than Bachelors Education %*	77.3	76.3	78.9
Rural %**	20.7	20.1	20.9
Low and Medium HDI %***	24.8	24.8	21.9

*Education data available for cohorts 2-3 only.

**Rural classified as the least urban/most rural districts which fall in the bottom quintile in terms of the proportion of urban population as reported in The Population Census (2017).

*** Human Development Index (HDI) classification is based on district level HDI values in UNDP's National Human Development Report (2017).

Survey data

Since the administrative data were collected before and during the program, they lack information on trainees' post-program outcomes. To address this gap, a three-pronged methodological approach was adopted to collect additional data for program evaluation (see Figure 1). After analyzing the administrative data, 40 trainees from the most recent cohort (cohort 3) who passed the enrollment stage were randomly selected. These trainees were equally divided by gender and completion status. Qualitative interviews were conducted with these 40 trainees via phone to understand 1) their goals and objectives before joining the program, 2) their experience during the program, and 3) their experience after the program. Insights from these interviews informed the design of a quantitative survey administered to a larger sample of trainees. The quantitative survey sample included 1,095 trainees from all 3 cohorts who completed the program and 420 trainees from cohort 3 who did not, yielding a total sample of 1,515. To gather more information about marginalized groups, we over-sampled females and stratified the male sample by location when selecting the 420 trainees. From the 1,515 trainees selected for the quantitative survey, we successfully interviewed 685 over the phone. The response rate of 45% is typical for a non-incentivized phone survey.

Table 2 presents the profile of the surveyed trainees. By design, the sample includes a higher proportion of females among the surveyed trainees, and most trainees completed the program. Approximately 38% of the trainees had worked before the program, while 62% are currently employed, with an average monthly income of 39,800 PKR. These trainees tend to be younger, with a median age of 25.

Figure 1: Three-Pronged Methodological Approach

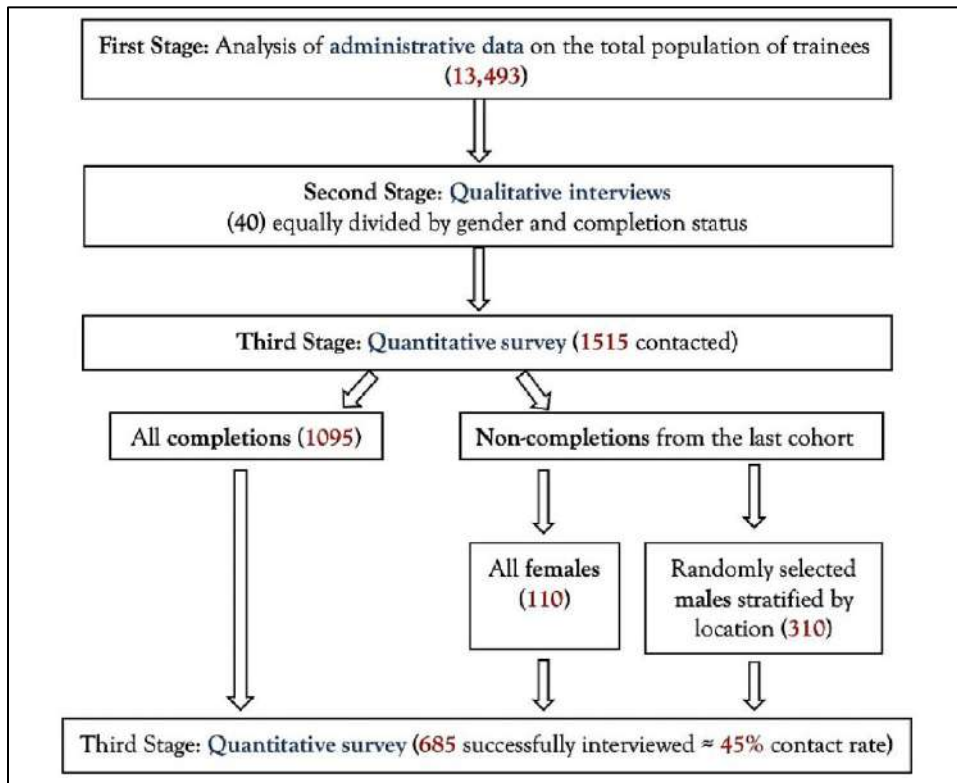


Table 2: Profile of Surveyed Trainees

	Surveyed Successfully
Total Sample (count)	685 (of 1,515)
Females %	27
Completed the course %	74.7
Working before the program %	37.9
Working now %	62.4
Average monthly income now (in thousands) PKR	39.8
Median Age (years)	25

The quantitative survey gathered detailed data on trainees' employment status, earnings, and self-confidence before and after the program. This information allowed us to examine both the financial and nonfinancial benefits of the program (Sections 3.2 and 3.3) and assess the effectiveness of different courses (Section 3.4). Additionally, we collected insights into trainees' expectations and experiences with

the training program. Based on these findings, we offer recommendations for improving the training programs in the future (Section 4).

Results

3.1 *What is the Gender, Educational, and Socioeconomic Profile of Trainees, and Does the Program Target Vulnerable Groups?*

The training programs at PSDF aim to facilitate the transition into sustainable employment and income-generating opportunities for the poor, vulnerable, and youth. In this section, we evaluate whether program targeting aligns with its stated objectives. To do so, we assess trainee status across four dimensions: gender, education, age, and geographical region. Trainee status is categorized based on their progression through the program: individuals are considered signed-up if they expressed interest in joining the program, invited if they received an invitation email to participate, enrolled if they successfully completed all registration steps on the Coursera platform, and completed if they finished all modules and secured a pass in coursework.

For all figures displaying trainee status information, we use the following color codes: navy blue for sign-ups, maroon for invited, green for enrolled, and yellow for completed.

By gender: Figure 2a presents the gender-disaggregated number of program participants at each stage of the program cycle. The figure reveals two key findings: (i) overall, approximately one in five trainees is female, and (ii) there is attrition at each step, with a higher rate among male trainees compared to females, as evidenced by a substantial decline in program participants from the sign-up stage to the completion stage.

Figure 2b displays the invite rate (the proportion of sign-ups who were invited), the enrollment rate (the proportion of invited trainees who enrolled successfully), and the completion rate (the proportion of enrolled trainees who completed the course) by gender.

Although more men express interest in signing up for the course compared to women, once enrolled, men and women are equally likely to complete it. Course completion rates are only marginally higher for males (22.9%) compared to females (21.4%), and this difference is not statistically significant (Figure 2b). This suggests that while PSDF x Coursera courses initially attract fewer women, those who overcome initial barriers and enroll successfully are serious candidates committed to completing the training program. The equal likelihood of both men and women completing the training may also indicate that the flexible scheduling and virtual

nature of these courses enable women to balance household commitments with the time required for course completion.

By education: Figure 3 presents participation statistics across three education levels: matriculation, intermediate, and bachelor's. Figure 3a displays the total number of individuals who signed up (blue bars), were invited (maroon bars), enrolled (green bars), and subsequently completed their course (yellow bars). We observe that three out of four trainees who enroll in the program report intermediate as their highest completed level of education. Figure 3b shows that the completion rate is 5 percentage points higher for trainees with an intermediate level of education (36.6%) compared to those with a bachelor's degree (31.7%). This gap may be attributed to individuals with higher education levels potentially having stable careers, which could reduce their motivation or incentive to complete the course. Additionally, their work schedules may not provide sufficient flexibility to focus on the training, or they might find the course content less relevant to their career goals, leading to lower completion rates.

Figure 2: Trainee Status by Gender

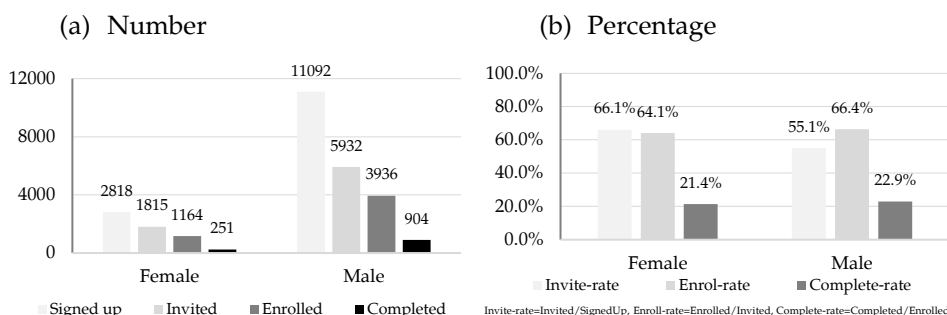
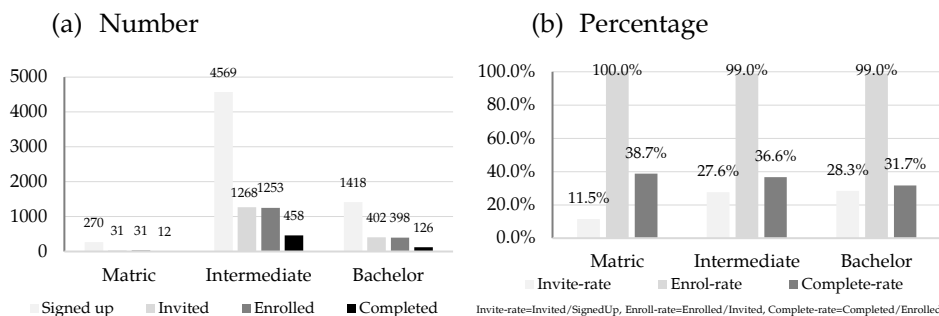


Figure 3: Trainee Status by Education

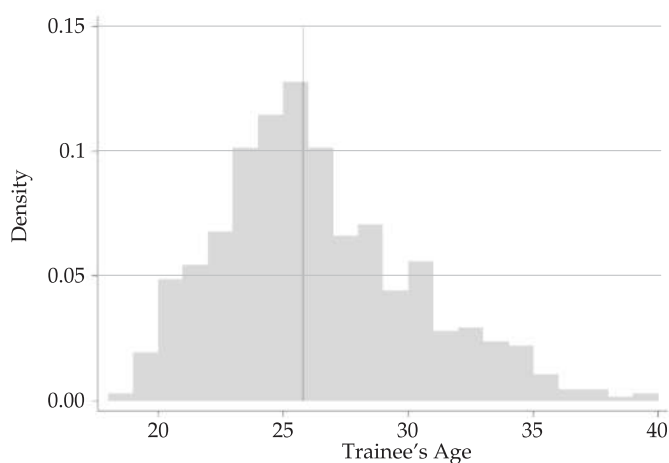


By age: Figure 4a displays the density distribution of the trainees. The median and average age of trainees is 25 years. Females are, on average, 2 years younger than

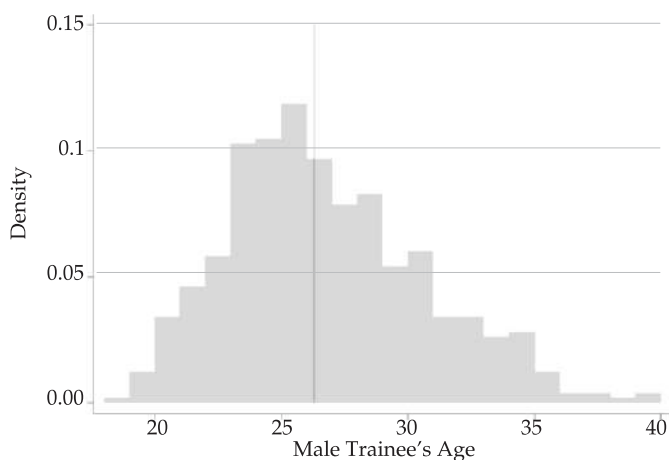
male trainees, as shown in Figures 4b and 4c. We believe this age demographic is significant because it coincides with a period when individuals are either seeking employment or planning a career change, for which they may require job-ready skills. This age group often includes individuals who have worked in entry-level positions for some time and may seek to advance their careers by acquiring new skills. Additionally, young women may face barriers to accessing formal education, leading them to pursue vocational training at a younger age as an alternative means of skill development and empowerment.

Figure 4: Age Distribution of Surveyed Trainees

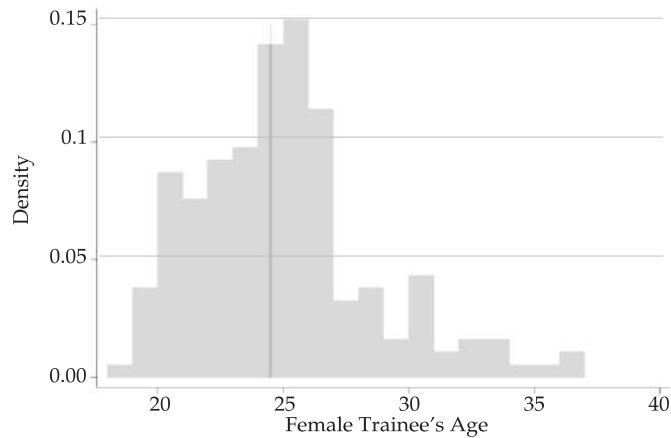
(a) Full Sample



(b) Male



(c) Female



By region

We also analyze the geographic variation in program participation. To accomplish this, we use the following three methods to categorize regions and compare patterns between them:

City districts (Lahore, Rawalpindi, Faisalabad, Gujranwala, Multan) versus other districts in Punjab.

Most urban districts (100% urban population) versus least urban districts (15–19% urban population, as defined by the 2017 Population Census). The average proportion of urban population in Punjab is 27.7%.

Districts with high versus medium and low levels of Human Development Index (HDI), based on district-level HDI values in UNDP's National Human Development Report (2017).

Even though invite rates are higher in other districts (Figure 5b), least urban districts (Figure 6b), and those with low HDI (Figure 7b), individuals from city districts, most urban districts, and high-HDI districts are more likely to enrol successfully, as their enrolment rates are higher.

Despite considerable differences in enrolment, completion rates are only marginally higher in city, most urban, and high-HDI districts versus other, least urban, and low/medium-HDI districts. These differences are not statistically significant. This means trainees from less developed areas are as likely to complete a course as trainees from developed areas in Punjab. This may indicate that other constraints or factors are more relevant for completion rates.

Figure 5: Trainee Status for City Districts versus Others

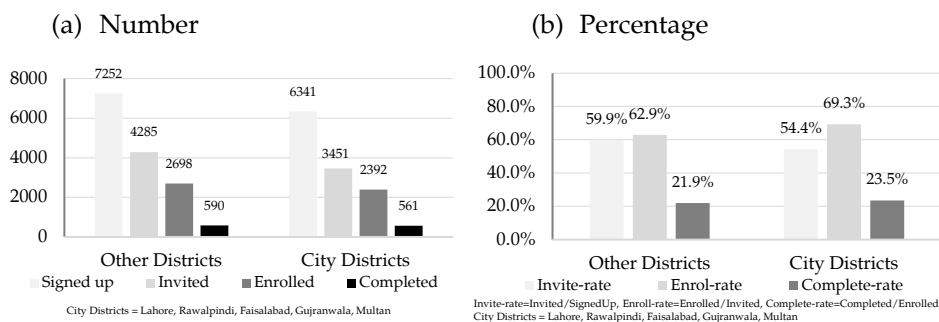


Figure 6: Trainee Status by District's Rural/Urban Classification

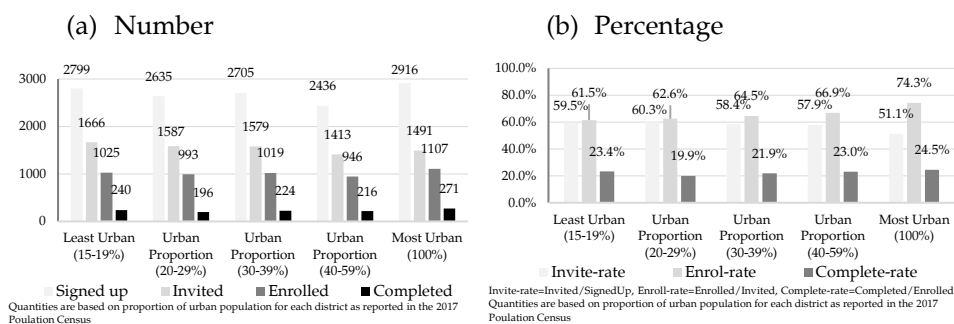
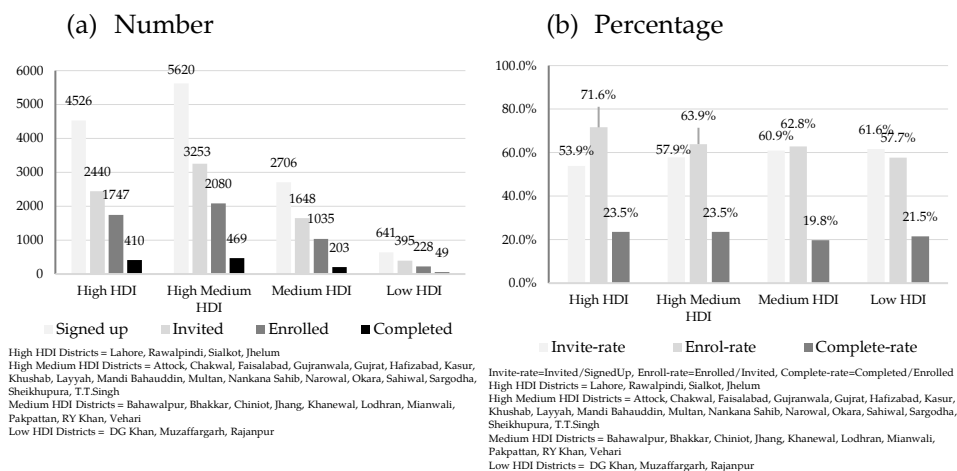


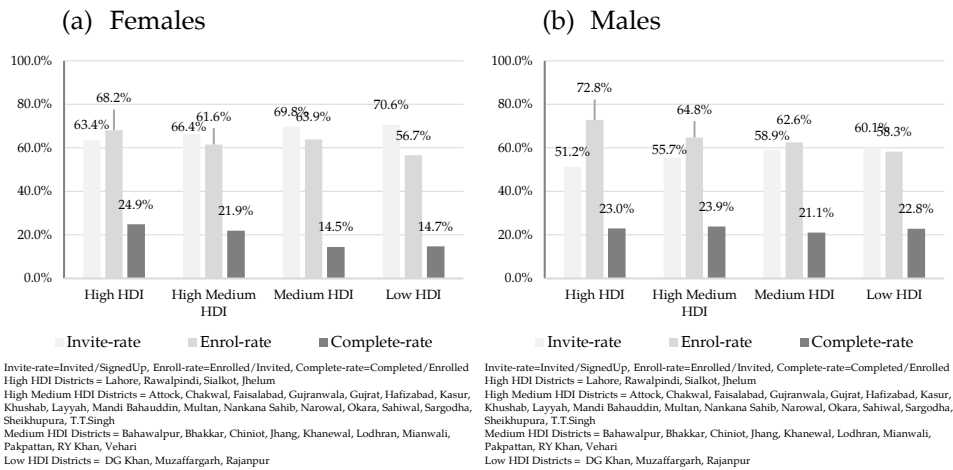
Figure 7: Trainee Status by District's Human Development Classification



While we do not observe disparities in completion rates by gender or region at an aggregate level (Figure 2), significant gender disparities emerge in low-human development index (HDI) areas. Male completion rates (22.8%) are 8 percentage points higher than those of females (14.7%; Figure 8).

Moreover, constraints to completion disproportionately affect females. A male trainee in a low-HDI district is as likely to complete the course (22.8%) as a male trainee in a high-HDI district (23%). However, female trainees in low-HDI areas (14.7%) are 10% less likely to complete the program compared to their counterparts in high-HDI regions (24.9%). This disparity aligns with structural challenges in less developed regions, such as gender gaps in educational access, financial constraints, conservative gender norms, inadequate support services for skill development, and limited employment opportunities for women. Improving completion rates in these regions may require comprehensive efforts to address intersecting socioeconomic, cultural, and structural barriers.

Figure 8: Trainee Status by District's Human Development Classification and Gender



3.2 What are the pecuniary benefits of the program on employment and in- come?

In this section, we evaluate the pecuniary benefits of program completion on trainees' employment and income. We categorize the sample into three groups: students, unemployed individuals, and those already employed before the program began. We assess the program's impact separately for each group.

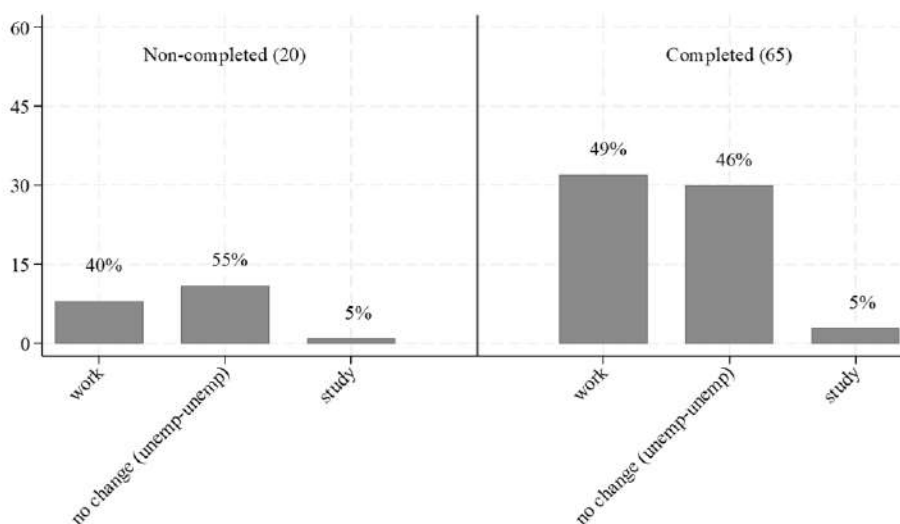
For students: 340 trainees were students when they started the program, with a completion rate of 77%. We examine whether completing the program influences students' transition to employment. Figure 9 illustrates three types of transitions:

from study to work, from study to unemployment or job search, and no change in student status. We compare these transitions based on completion status. Each bar in Figure 9 represents the total number of trainees who experienced the transition, with percentages above each bar indicating the proportion relative to completed and non-completed trainees.

The primary finding from Figure 9 is that students who completed the program had a 9 percentage point higher transition-to-work rate compared to those who did not complete it. This suggests that students who finished the program were more likely to secure employment opportunities than their non-completing peers.

A related finding from Figure 9 is that students who completed the course are more likely to transition out of study, as evidenced by the proportion of students with no status change after the program. We hypothesize that this is because students in their final years are particularly motivated to acquire skills that are in high demand by employers, which may contribute to their elevated program completion rate.

Figure 9: Transition for Student Trainees



For the unemployed: 85 trainees were unemployed before joining the program, with 65 completing it, yielding a completion rate of 76%. We examine the program's impact on their transition out of unemployment. Figure 10 illustrates three types of transitions: from unemployment to work, no transition, and from unemployment to school. We analyze the sample by completion status to assess the effect of program completion.

Figure 10: Transition for Previously Unemployed Trainees

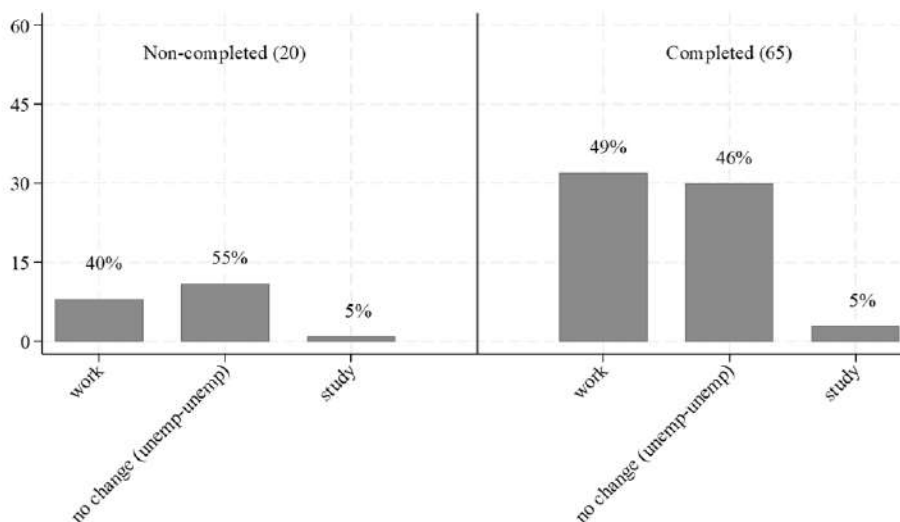
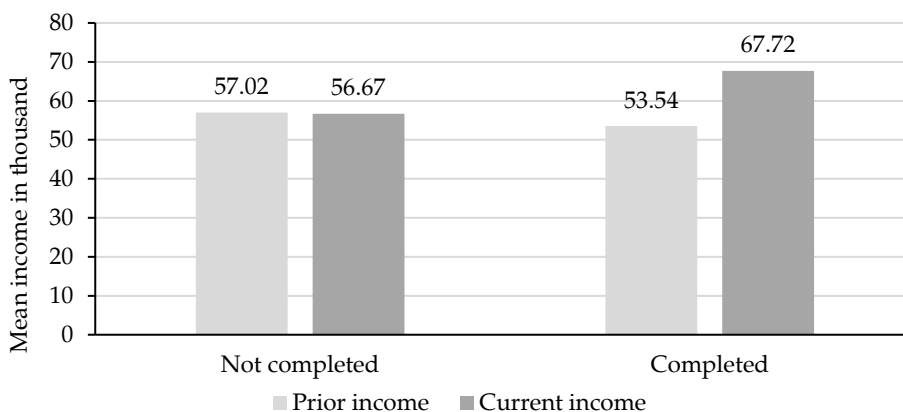


Figure 10 indicates that the transition to work after the program is 9 percentage points higher among unemployed trainees who completed the course. This suggests that program completion had substantial, positive effects on unemployed trainees' transition to employment.

For the employed: 259 trainees were employed when they started the program, with 183 completing it. We investigate whether previously employed trainees experienced any changes in income following the program. Figure 11 displays trainees' prior and current income by completion status.

Figure 11: Income Change for Previously Employed Trainees



259 trainees employed before the program, of these 183 completed while 76 did not complete the course

Trainees who completed the program had comparable prior income levels to those who did not complete, yet they now receive a substantial additional monthly income of PKR 14,000. In contrast, no discernible change in income was observed for non-completers.

Our analysis demonstrates that completing PSDF's training programs yields considerable pecuniary benefits, both in terms of employment transitions and earnings. Specifically, trainees who completed the program are more likely to secure employment or experience a notable salary increase.

3.3 What are the non-pecuniary benefits of the program on confidence, career goals and personal development?

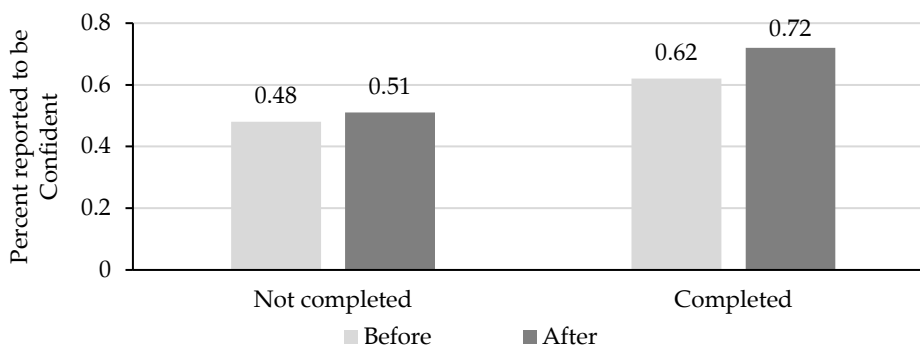
Besides the pecuniary benefits, acquiring new skills can also lead to improvements in non-pecuniary aspects, such as trainees' confidence, career goals, and personal development.

On self-report confidence: We asked trainees to report their retrospective level of confidence for completing the program before they started and their current level of confidence for completing a similar training program in the future. Figure 12 shows the self-reported confidence by completion status.

Two patterns emerge: Among trainees who completed the course, their confidence level improved. No significant change was observed for those who did not complete the program. Additionally, trainees who completed the course had a significantly higher level of confidence than others before the program began. This might suggest that interventions aimed at boosting self-confidence could improve completion rates.

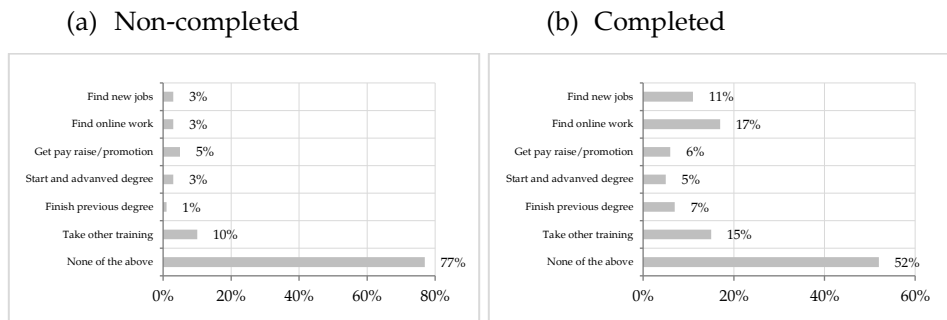
Appendix Figure A1 shows that confidence improvements were observed for both men and women who completed the course, with similar magnitudes.

Figure 12: Change in Confidence by Completion



On career goals: To understand the program impact on trainees' career goals, we ask trainees whether they have experienced various changes after the program. Figure 13 reports the results by completion status. Compared to trainees who did not complete the program, those who did are much more likely to experience positive changes such as finding new/online jobs, getting pay raise, finishing/starting a degree, and taking other training programs. Appendix Figures A2 and A3 show the disaggregated results by gender and the same results are true for both males and females.

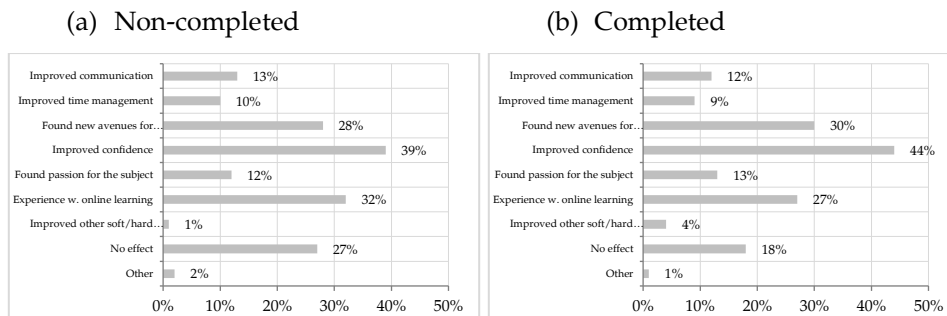
Figure 13: Impact on Career Goals



To understand the program's impact on trainees' career goals, we asked whether they experienced various changes after the program. Figure 13 reports the results by completion status. Compared to trainees who did not complete the program, those who did are more likely to experience positive changes such as finding new or online jobs, receiving a pay raise, finishing or starting a degree, and taking other training programs.

Appendix Figures A2 and A3 provide disaggregated results by gender, confirming that these outcomes hold true for both males and females.

Figure 14: Impact on Personal Development



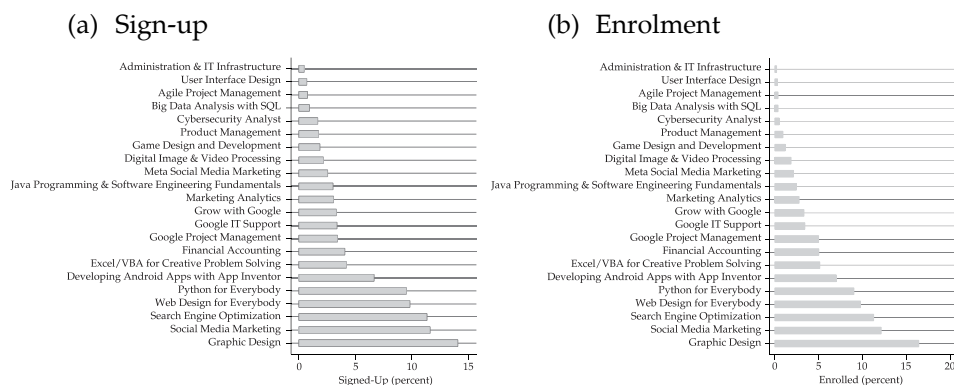
3.4 Which courses are most effective at income generation?

In this section, we explore which courses are most popular among students and which are most effective at generating income. Figure 15 illustrates the most popular courses at the sign-up, enrollment, and completion stages.

As shown in Figures 15a and 15b, the top five courses with the highest number of sign-ups and enrollments are Graphic Design, Social Media Marketing, Search Engine Optimization, Web Design for Everybody, and Python for Everybody. However, these courses do not have the highest completion rates.

Figure 15c reveals that the top five courses with the highest completion rates are Financial Accounting, Marketing Analytics, Agile Project Management, Google IT Support, and Administration & IT Infrastructure. This suggests that while certain courses may attract more initial interest, others are more effective in retaining students through to completion.

Figure 15: Most Popular Courses



(c) Completion

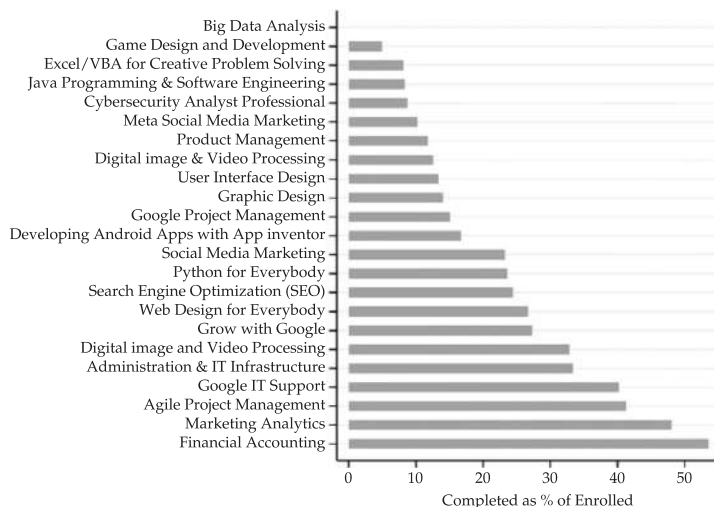
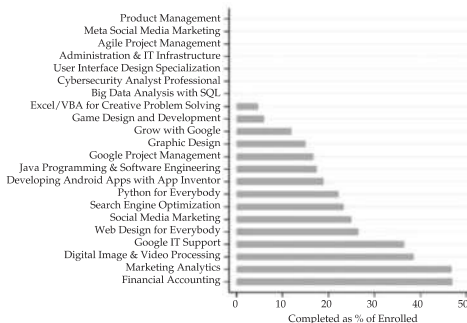


Figure 16 presents gender-disaggregated program completion rates, revealing that Financial Accounting, Marketing Analytics, and Google IT Support are among the top five courses with the highest completion rates for both male and female trainees.

Figure 16: Completion by Gender and Program Choice

(a) Female



(b) Male

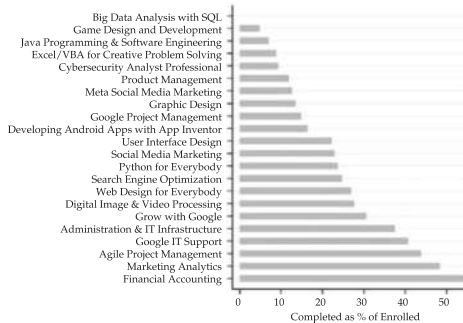
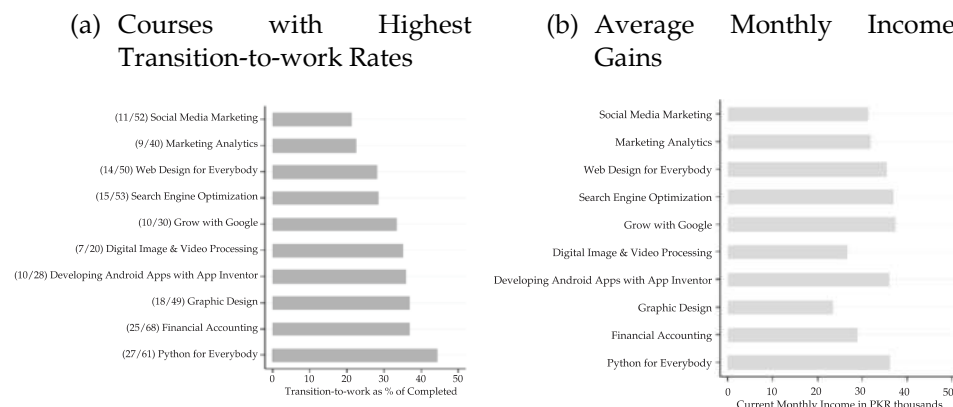


Figure 17 highlights the top ten courses with the highest transition-to-work rates after program completion (17a) and mean monthly income (17b). The top five most effective courses for transitioning to work are Python for Everyone, Financial Accounting, Graphic Design, Developing Android Apps with App Inventor, and Digital Image & Video Processing. Notably, some of these courses are also among

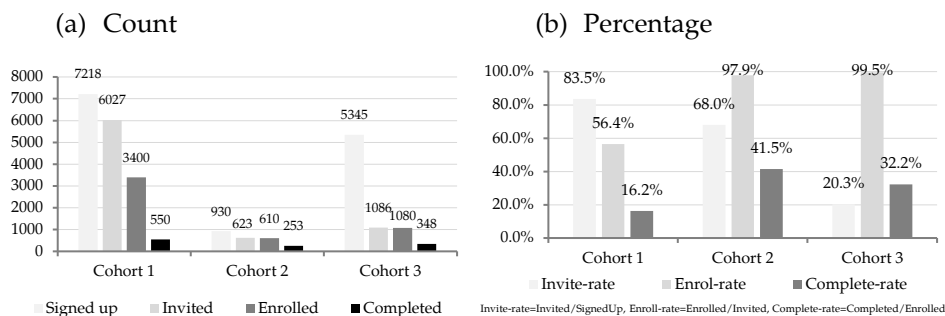
the most popular at the sign-up stage, although they often have lower completion rates. This suggests that trainees have some awareness of which skills are most effective at generating income, but acquiring these skills poses challenges.

Figure 17: Top 10 Courses



We analyzed completion rates separately for each cohort to whom the program was offered. Figure 18 shows that completion rates have doubled from 16% in the first cohort to 32% in the last cohort.

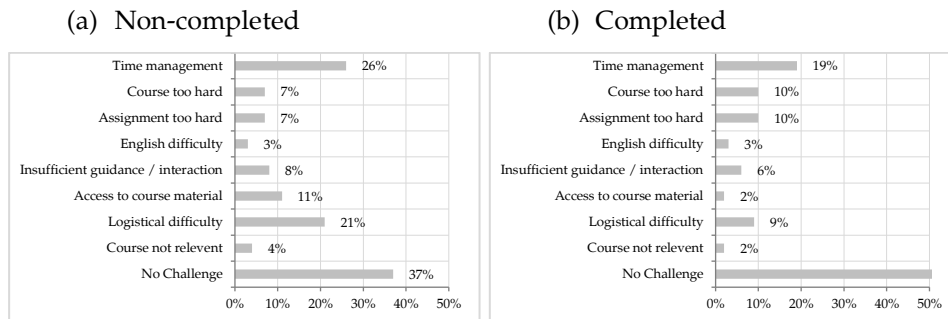
Figure 18: Trainee Status by Cohort



However, the trainee survey reveals that trainees continue to report challenges to completion. Figure 19 shows the challenges reported by trainees, categorized by completion status. Notably, time management is the most frequently cited challenge for both trainees who completed the course and those who did not. This is understandable, as balancing work, family, and other commitments can be difficult. Procrastination or ineffective planning may also contribute to the challenges in managing time. This highlights the need to integrate time management skills into

the curriculum or provide resources and support to help trainees develop these skills, such as through goal setting or positive reinforcement. Time management is a valuable lifelong skill that can benefit trainees not only during their training but also in their future careers.

Figure 19: Challenges to Completion



From a policy perspective, an important challenge cited by several trainees was the insufficient guidance or interaction with training providers. In separate focus group discussions involving at least ten trainees, participants expressed the need for continued guidance and the availability of support services to address issues related to understanding course content or navigating the platform. For instance, approximately ten percent of trainees cited logistical difficulties, course content challenges, or overly demanding assignments as significant barriers to completion. This highlights the importance of creating online forums or communities where trainees can interact with peers and seek guidance.

Additionally, there are other challenges that, although less frequently reported, are crucial and need to be addressed to improve completion rates. For example, language barriers and access to course materials are significant issues that can hinder trainees' progress.

3.5 Cost-benefit analysis

To assess the long-run viability of the online training program from PSDF's perspective, we compare its costs and benefits. Table 3 outlines the program costs and estimates the average cost per completion to be PKR 27,000 for a three-month long course. This analysis provides insight into the financial sustainability of the program and helps evaluate whether the benefits justify the investment.

Table 3: Cost per Completion

Total Licenses procured (last year)	530
Total Completions in 9 months (actual)	606
Total Completions in 12 months (Predicted)	808
License procurement cost (PKR) yearly	20,252,000
Media cost (PKR) yearly	1,087,955
Total cost (license + administrative)	21,339,954
Cost per completion (12 months)	26,410

Table 4 details the pecuniary benefits of program completion by trainee type, focusing on those who completed the program. For trainees who were previously employed, they experienced average monthly income gains of PKR 14,000, allowing them to recover the program cost in approximately two months. A significant proportion of student trainees successfully transitioned into employment, with average monthly income gains of PKR 26,500, enabling them to recover the cost in just one month. For those who were previously unemployed, the average income gains were PKR 32,500, allowing them to recover the program cost in less than one month. Overall, the average monthly income gains from program completion are approximately PKR 23,100, which can offset the per-completion cost in less than two months.

Table 4: Pecuniary Program Benefits

Trainee Type	Avg. Monthly Income gain (PKR)	Months Taken to Recover Cost
Previously employed ($N = 184$)	14,000	2
Previously student ($N = 263$)	26,500	1
Previously unemployed ($N = 65$)	32,500	<1
Total ($N = 512$)	23,100	1.1

Our comparison of program costs and pecuniary benefits for trainees reveals that the benefits outweigh the costs, making the program a viable use of PSDF resources. We highlight two key takeaways from this analysis:

The program also generates significant non-pecuniary benefits for trainees, such as improvements in self-confidence and personal development. These benefits, while not quantifiable, strengthen the case for continuing the program.

Trainees who completed the program benefited in multiple dimensions. Therefore, a crucial task for PSDF is to support trainees who struggle with the course. The next section will discuss recommendations for improving completion rates.

4. Conclusions, Recommendations and Way Forward

To further understand whether the training courses meet the demand for skills in the labor market, we engaged with industry experts from Rozee.pk, Pakistan's leading job portal. Key insights from these conversations include that over the past year, there has been a significant reduction in hiring by 30% across firms listed on Rozee.pk. However, the ICT and freelancing sectors have continued to expand, with a growing demand for skilled labor.

The top skills in demand include programming, designing, finance, and Microsoft skills, which align with those targeted by PSDF's training programs. Additionally, there is an increasing trend of professionals turning to freelancing to create additional income streams.

These findings confirm that PSDF's training programs target the right skills, enabling trainees to capitalize on the growing ICT and freelancing market despite economic challenges. The flexibility of freelancing jobs makes these digital skills particularly valuable for marginalized groups, such as women and adolescents, to enter the labor force and generate additional income.

To further enhance the effectiveness of these programs, two key challenges need to be addressed. First, improving completion rates is essential, as administrative data indicates that only one in five trainees completes the course after enrolment. Common obstacles include logistical issues with the course, lack of interaction, and time management challenges.

Second, helping trainees with skill utilization is crucial. Qualitative interviews revealed that many trainees fail to utilize their new skills for income-generating activities. Common reasons include the skills being perceived as too basic, uncertainty about how to apply them, and difficulty starting a freelancing career. Addressing these challenges will be crucial for maximizing the impact of PSDF's training initiatives.

To enhance the effectiveness of PSDF's training programs, we propose several steps to be undertaken before, during, and after the program.

Before the program begins, PSDF could conduct an online skills test for applicants to help them select courses at the right difficulty level. Our survey data reveals significant heterogeneity in trainees' background knowledge, so this assessment could address potential demotivation when courses are too basic or difficult. Additionally, inviting trainees enrolled in the same course to an in-person session could be beneficial. During this meet-and-greet, participants can connect with others interested in the same program, fostering a learning community. They

can also be encouraged to set up a WhatsApp or Facebook group to enable communication with each other throughout the program.

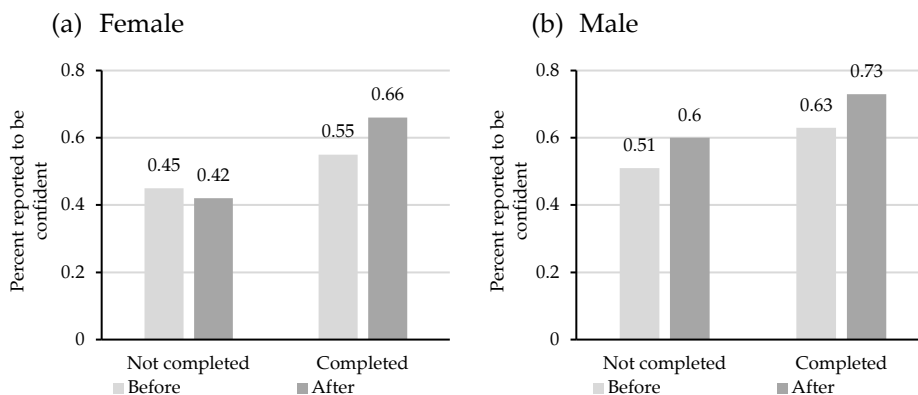
During the program, we propose introducing a mentorship program where graduate trainees guide current trainees throughout the course. Mentors can assist trainees with limited experience in online learning by helping them navigate the Coursera platform, address logistical issues, and provide tips on time management and career guidance.

After the program, we suggest offering follow-up sessions focused on skill utilization and job opportunities. These sessions could cover topics such as starting a freelancing career and provide guidance on where to find relevant job openings. Trainees, particularly women from disadvantaged backgrounds, often struggle to apply their skills without additional support. The follow-up sessions could feature successful graduates or industry experts sharing their experiences with trainees post-program. Alternatively, connecting trainees with freelancing firms could be an effective way to help them launch a new career path.

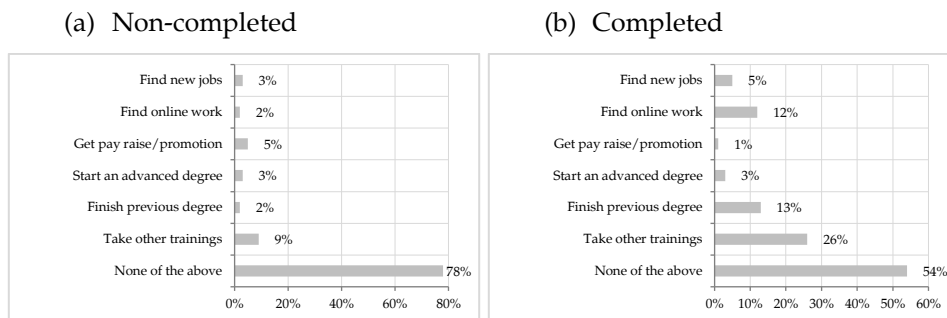
Going forward, these steps can be piloted with a smaller sample of trainees to assess their effectiveness. Some of these recommendations may be quicker to implement at relatively low costs, while others may require expertise in skills assessment. For the latter, PSDF might consider collaborating with specialized organizations that offer such services, such as Rozee.pk. This collaboration could enhance the program's effectiveness and ensure that trainees receive the support they need to succeed.

Appendix A

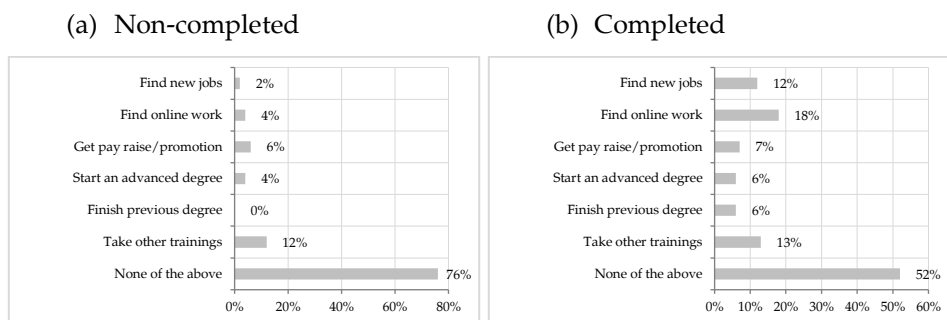
Appendix Figure A1: Confidence Change by Gender



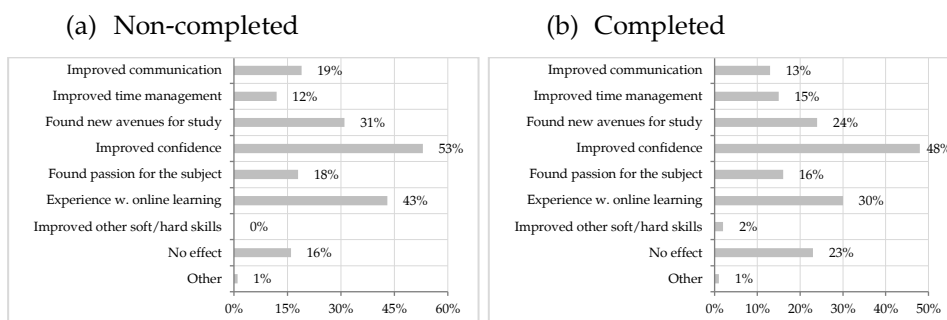
Appendix Figure A2: Impact on Career Goals for Females



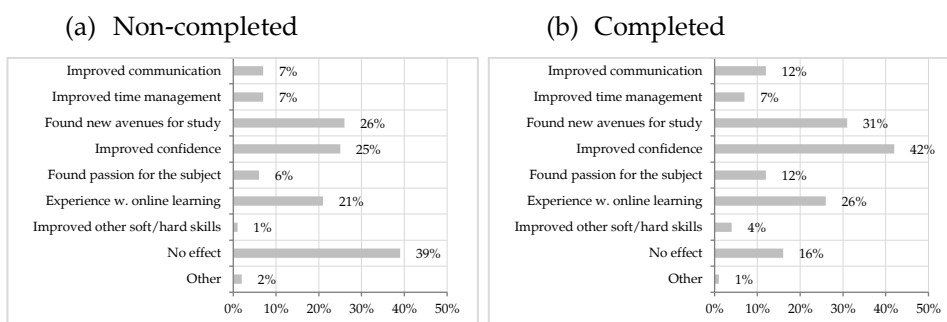
Appendix Figure A3: Impact on Career Goals for Males



Appendix Figure A4: Impact on Personal Development for Females



Appendix Figure A5: Impact on Personal Development for Males



9

Reallocation of Investment from the Public to the Private Sector

Rabia Ikram¹, Muzzna Maqsood² and Moazam Mahmood³

Abstract

Pakistan's economic growth has experienced a significant decline since the 1990s, with an average GDP growth reduction of 1.84 percentage points, coupled with a 3.11 percentage points decrease in investment growth (Ikram and Mahmood, 2022). A key factor contributing to this downturn is the decline in public investment, particularly in the electricity sector. During the 1990s, structural adjustment policies emphasized privatization, leading to the withdrawal of public investment from the electricity sector. This shift resulted in the establishment of 18 independent power plants (IPPs), based on the premise that private entities would operate more efficiently.

However, this privatization policy, particularly in the energy sector, raises critical questions about its effectiveness in reallocating resources from the public to the private sector. Using comprehensive data from sources such as the Ministry of Energy (MOE), Central Purchase Power Agency (CPPA), State of Industry Reports (SOIR), and Power Statistics, a detailed analysis reveals significant changes in the energy mix. The public-to-private electricity generation ratio shifted from 70:30 to 40:60, while the generation mix transitioned from low-cost hydel to high-cost thermal energy. Consequently, the electricity growth rate halved post-privatization (since 1994), and private sector electricity generation cost nearly doubled those of the public sector by 2023. The growing share of capacity purchase price relative to energy purchase price in total power purchase price implies a potential increase in costs for consumers. These findings challenge the efficiency hypothesis underlying privatization in Pakistan's energy sector. Policymakers are faced with two potential paths: restructuring the private sector or regaining control over electricity generation to ensure cost-effectiveness and sustainability. Addressing

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these issues is crucial for revitalizing Pakistan's energy sector and supporting broader economic recovery.

Introduction

The economic reforms of the 1990s marked a transformative period in Pakistan's policy framework, driven by structural adjustment programs introduced by the International Monetary Fund (IMF) and the World Bank. These reforms emphasized privatization, deregulation and liberalization, particularly targeting the energy sector. Public investment in electricity generation was withdrawn, and private sector participation was encouraged through the energy policies of 1994 and 1998, developed in collaboration with the World Bank and Asian Development Bank (ADB). These policies facilitated the establishment of Independent Power Plants (IPPs), assigning them electricity generation responsibilities while leaving transmission and distribution to the public sector.

The reforms of 1990's led to the unbundling of Pakistan's major public sector entity, Water and Power Distribution Authority (WAPDA), and initiated a comprehensive privatization program in the power sector. This transition was based on the expectation that private sector participation would enhance economic efficiency and improve resource allocation.

Arising from the policy shift of 1990's, this paper explores two plausible research questions:

- a) How effective has the reallocation of resources from the public to the private sector been?
- b) Does the empirical evidence support the argument that privatization has benefited the energy sector?

Literature review

We now examine the literature on the role of public goods, the declining trend in public goods, and the influence of the regulatory policy environment on the provision of public goods, in context of the two plausible questions outlined in the introduction.

The role of public goods

There is considerable consensus in the literature that public investment in both developing and developed countries drives economic growth. Studies consistently show a strong positive correlation between GDP growth and public sector investment, particularly, the scaling up of public investment in infrastructure,

construction, transport (Aschauer, 1989; Cullison, 1993; Barro, 1989; Ramirez, 2000; Papagni et al., 2021).

Further, in low-income economies where public investment in energy and infrastructure is lacking, the resulting loss of productivity levels has been detrimental to GDP growth (Straub, 2008; Briceño-Garmendia et al., 2008).

Empirical simulations further underscore the growth impact of public investment in infrastructure. Calderón and Servén (2003, 2008) demonstrated that if low-income countries halved their infrastructure gap to match middle-income countries, their annual GDP growth rates could increase by 2 percent. For sub-Saharan Africa, achieving the infrastructure level of Mauritius could boost GDP growth by 2.3 percent annually. Furthermore, catching up with infrastructure levels in advanced economies like South Korea could raise GDP growth by 2.6 percent annually. Therefore, public investment in infrastructure has a well-observed and significant impact on output growth, while constraints on such public goods can be detrimental to output growth.

The declining trend in public goods

Despite the recognized importance of public investment, a declining trend in the provisioning of public goods has been observed globally. Low-income countries face an infrastructure deficit compared to middle-income countries, with the gap widening over time (Briceño-Garmendia et al., 2008). The drop in public investment growth is not limited to low-income countries; it is also evident in advanced and emerging economies, largely due to episodes of fiscal consolidation (Breunig & Busemeyer, 2012; Väilä & Mehrotra, 2005).

The literature identifies the regulatory policy environment as a key factor influencing public sector investment in advanced, middle, and low-income countries. This environment is shaped by both internal public sector policies and external advocacy.

The role of government expenditure

The role of government expenditure in economic growth is well-recognized in public policy and growth literature. Endogenous growth models, such as those by Barro (1990), Barro and Sala-i-Martin (1992, 1995), and Mendoza (1997), emphasize the mechanisms through which fiscal policy influences investment levels, output and steady-state growth rates. Empirical studies, including Kneller et al. (1999), support these models, highlighting that productive government expenditure on health, education, and infrastructure significantly enhance growth, while non-productive spending does not.

However, pursuing fiscal discipline often reduces public investment. The literature on achieving fiscal discipline suggests that the governments' ability to allocate resources to public investment decreases as pressures for fiscal consolidation increase. In most economies, whether rich or poor, there is a tendency for discretionary government expenditures to shrink, with most of these falling under public investment expenditures (Streeck & Mertens, 2011; Breunig & Busemeyer, 2012). Additionally, policymakers typically increase spending on current expenditures during favorable economic conditions but adjust capital expenditures during downturns (Ardanaz & Izquierdo, 2017).

Martner and Tromben (2005) show that from 1998 to 2003, when Latin American countries implemented fiscal reforms, governments postponed public investment projects rather than cutting current expenditures. Similarly, Tellez et al. (2020) argue that public investment in advanced economies has been at historical lows since the 1980s, primarily due to rigid fiscal rules exerting downward pressure on public investment.

Fedelino and Hemming (2005) propose modifying traditional fiscal policy frameworks by examining fiscal indicators and targets better suited to safeguarding public investment. They conclude that public investment should be financed from public resources, with borrowing for such investments delinked from overall borrowing or public debt.

Empirical evidence from Ardanaz et al. (2021) shows that a fiscal consolidation of at least 2 percent of GDP is associated with an average 10 percent reduction in public investment in countries with no fiscal rule or with rigid fiscal rules. Conversely, under flexible fiscal rules, the negative effect of fiscal adjustments on public investment disappears. Thus, fiscal rules significantly impact GDP growth.

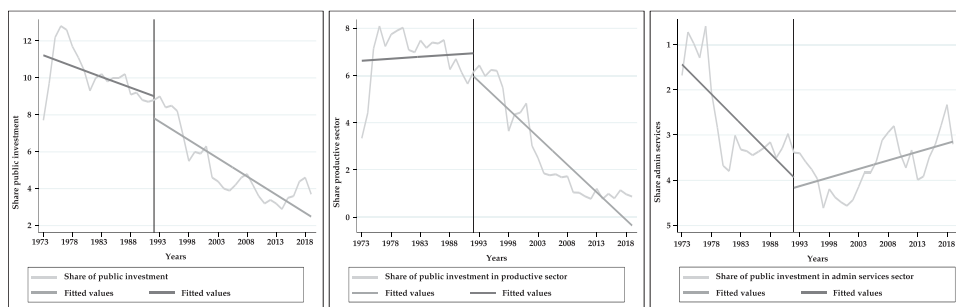
The literature demonstrates that public investment has significantly declined globally, with developing countries experiencing more severe consequences than developed ones. This decline is attributed largely to the regulatory policy environment, shaped by multilateral institutions, which negatively impacts fiscal indicators, such as development and public investment expenditures. These findings are particularly relevant to Pakistan's structural reforms in the 1990s, which shifted the energy sector from public to private sector.

The following sections will examine the decline in macroeconomic determinants of GDP growth during the 1990s, analyze the privatization policy in the energy sector, and provide a description of the data and discussion of the two research questions.

Drop in the Macro Determinants of GDP growth in Pakistan

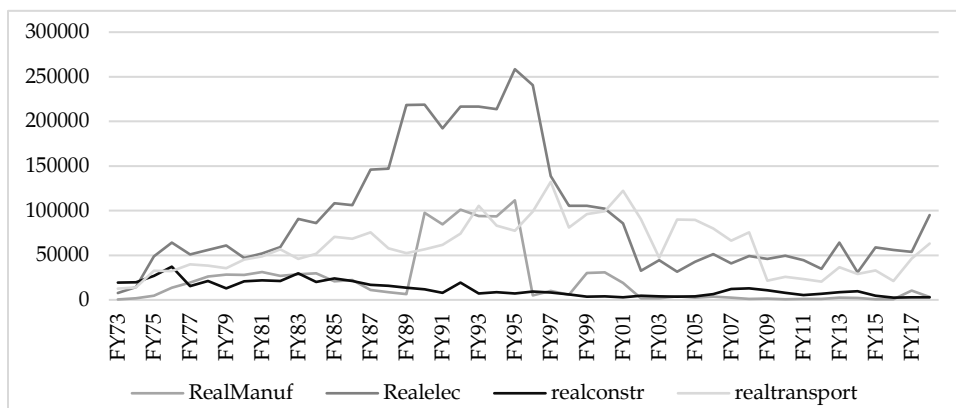
Ikram (2022) highlight that Pakistan's GDP growth dropped by an average of 1.84 percentage points, aligning with a decline in investment growth by 3.11 percentage points. This reduction is primarily attributed to a significant drop in public investment over time, while the private sector remained constant (Figure 3). The decline in public investment has been particularly pronounced in the productive sectors (Figure 1) with electricity sector experiencing the most substantial decrease (Figure 2). Figures 1 through 3 illustrate these trends.

Figure 1: Share of Public Investment in Productive sectors and Administrative and Services



a) Share of Public Investment b) Share of Public investment c) Share of Public Investment
in Productive sectors in Administrative and Services
Sector

Figure 2: Public Investments by Sector (Millions - Rs)

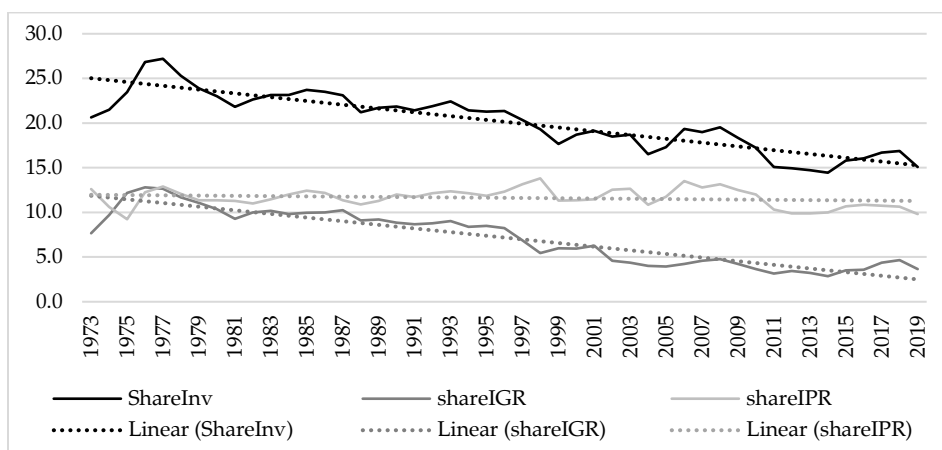


Four major productive sectors, manufacturing (RealManuf), electricity (Realelec), construction (realconstr) and transport (realtransport). were analyzed on the basis of the relative share value and fluctuations of each subsector in the

total productive sector investment. The real values of public investment in the selected subsectors are plotted in Figure 2 above.

The analysis of public investment trends in Pakistan's productive sectors reveals a consistent decline across all selected subsectors. Public investment in electricity rose until 1993, peaked that year, and then experienced a sharp decline. Similarly, public investment in transport increased until 1996 before declining. Construction showed a steady downward trend throughout the period, while manufacturing saw growth until 1994, followed by a significant drop.

Figure 3: Share Total Investment (shareInv), Share Public Investment (ShareIGR), and Share Private Investment (ShareIPR) as % of GDP



Privatization of Energy Sector

In the period leading up to the mid-1980s, Pakistan's energy requirements were met by two public sector organizations: WAPDA and KESC. These entities were responsible for generating, transmitting, and distributing electricity, primarily using hydropower (Kamal & Naqvi, 2008).

However, inefficiency, mismanagement, low productivity, and mounting debt plagued these organizations. By the mid-1980s, public sector's inability to address electricity shortages became increasingly evident.

In response, Pakistan sought assistance from the World Bank in 1987 to encourage private sector participation in the energy sector and attract private investors. In June 1988, the World Bank sanctioned a US\$150 million Private Sector Energy Development Project to support this initiative. The project aimed to mobilize the private sector resources to address power shortages and reduce widespread load shedding (Fraser, 2005).

Furthermore, Pakistan's dependency on the IMF further acted as a catalyst for significant policy changes, particularly through the Structural Adjustment Program (SAP) initiated in 1988 in cooperation with Government of Pakistan (GOP) (Anwar & Iqbal 1996; McGillivray 2003; Jafarey 1992). The program emphasized privatization of the public sector, and deregulation of economic structures and institutions. A primary focus was the power sector, with policies in the early 1990s aimed at withdrawing public investment, especially from the electricity sector. The energy policies of 1994 and 1998, developed in collaboration with the World Bank and Asian Development Bank, sought to increase private sector involvement through the establishment of Independent Power Plants (IPPs). Under these policies, IPPs were tasked slowly with electricity generation, while the public sector retained responsibility for purchasing electricity from the IPPs, and handling transmission and distribution to consumers (Parish, 2006).

These reforms led to institutional changes, including the unbundling of WAPDA. The economic efficiency hypothesis argued that privatization in the power would enhance private sector involvement and improve efficiency.

This economic efficiency associated with privatization in Pakistan's power sector hypothesis had several implications:

- 1) Private sector capacity for power generation would substitute public sector capacity.
- 2) Adding private sector capacity for power generation would increase the rate of capacity growth.
- 3) Private sector capacity would be more efficient in production costs than public sector capacity.
- 4) The gains from cheaper production costs by private sector capacity would be passed on to the consumer, enhancing welfare.
- 5) The increase in investment in more efficient private sector capacity would at least compensate for the drop in investment in less efficient public sector capacity.

While the process of privatization in the power sector has been accomplished, none of the other implications (2 to 5) have followed.

Data

The data for our analysis on the electricity sector is sourced from multiple government sources, including the Central Power Purchase Agency (CPPA), state of industry reports by the National Electric Power Regulatory Authority (NEPRA) (2006–2023) and the National Transmission and Distribution Company (NTDC).

How effective has the reallocation of resources from the public to the private sector been?

To answer the first research question, the analysis focuses on the energy sector and examines the transfer of resources from the public to the private sector. Using long-run time series data for public and private sector electricity production, Tables 1 and 2 illustrate sector-wise and source-wise generation data. These tables highlight the gradual substitution of public sector capacity by private sector capacity for power generation.

The reallocation has shifted from the public sector to the private sector and from hydropower to thermal electricity production. Total electricity generation increased tenfold from 14 GWh in 1981 to 141 GWh by 2021. Until 1995, all electricity was generated by the public sector but private generation began following investments around 1992. By 2022, private sector generation accounted for 62% of total production, compared to the public sector's 38%.

Table 1 shows a shift in Pakistan's electricity generation sources. Until 1995, hydropower accounted for 60% and thermal power for 40%, with hydropower produced by the public sector. The introduction of IPPs led to a reliance on thermal source, changing the ratio to 25% hydro and 75% thermal. This reflects a transfer of resources from the public to the private sector, aligning with privatization policies emphasizing private sector efficiency.

Does the empirical evidence support the efficiency hypothesis, privatization has been beneficial for the energy sector?

To assess the efficiency hypothesis favoring privatization, we consider three key indicators:

- i. Rate of growth of electricity generation
- ii. Cost of production of electricity
- iii. Financial implications for the GOP

The substitution of public sector investment by private sector investment in electricity generation should have raised the growth rate of total electricity generation. However, Figure 4 shows the opposite. The growth rate of total electricity generation was 8 percent before 1992 but halved to 4 percent per afterward. This decline coincides with the reduction in public investment around 1992.

Electricity generation growth dropped from 8% to 4%. Therefore, we conclude that the first argument for efficiency does not hold, as the rate of growth of electricity decreased rather than increased after private sector involvement.

Table 1: Source Wise Energy Generation (GWh)

Year	Public				Private					Public and Private total
	Hydro	Thermal	Nuclear	Total Public	Hydro (IPPs)	Thermal	Solar	Wind	Total Private	
1981-82	9526	4660	0	14186	0	0	0	0	0	14186
1982-83	11366	4554	0	15920	0	0	0	0	0	15920
1983-84	12822	4737	0	17559	0	0	0	0	0	17559
1984-85	12245	5907	0	18152	0	0	0	0	0	18152
1985-86	13804	6661	0	20465	0	0	0	0	0	20465
1986-87	15251	7058	0	22309	0	0	0	0	0	22309
1987-88	16689	9015	0	25704	0	0	0	0	0	25704
1988-89	16196	9555	0	25751	0	0	0	0	0	25751
1989-90	16925	12153	0	29078	0	0	0	0	0	29078
1990-91	18298	13653	0	31951	0	0	0	0	0	31951
1991-92	18647	16010	0	34657	0	0	0	0	0	34657
1992-93	21111	15157	0	36268	0	0	0	0	0	36268
1993-94	19436	17494	0	36930	0	0	0	0	0	36930
1994-95	22858	17158	0	40016	0	0	0	0	0	40016
1995-96	23206	18457	0	41663	0	161	0	0	161	41824
1996-97	20858	17068	0	37926	0	10740	0	0	10740	48666
1997-98	22060	15200	0	37260	0	13580	0	0	13580	50840
1998-99	22448	13769	0	36217	0	15326	0	0	15326	51543
1999-00	19288	19064	0	38352	0	17418	0	0	17418	55770
2000-01	17196	16798	1565	35559	63	22773	0	0	22836	58395
2001-02	18941	18620	1662	39223	115	21458	0	0	21573	60796
2002-03	22253	19570	1386	43209	97	20658	0	0	20755	63964
2003-04	27372	21012	1559	49943	105	18931	0	0	19036	68979
2004-05	25588	22181	2295	50064	83	23233	0	0	23316	73380
2005-06	30751	22479	2170	55400	104	26535	0	0	26639	82039
2006-07	31846	21587	1944	55377	96	32163	0	0	32259	87636
2007-08	28536	20497	2455	51488	131	34439	0	0	34570	86058
2008-09	27636	19568	1058	48262	547	35340	0	0	35887	84149
2009-10	27927	565	2095	30587	19632	38452	0	0	58084	88671
2010-11	31685	305	2930	34920	13044	42342	0	0	55386	90306
2011-12	28166	436	4413	33015	12652	43711	0	6	56369	89384
2012-13	29326	662	3668	33656	13838	40072	0	38	53948	87604
2013-14	31084	989	4431	36504	14248	43721	28	230	58227	94731
2014-15	31525	1020	5033	37578	14223	44441	231	464	59359	96937
2015-16	33151	1132	3885	38168	17294	44650	657	780	63381	101549
2016-17	31084	1016	5860	37960	19821	47316	664	1339	69140	107100
2017-18	27431	1137	8800	37368	17087	62487	665	2118	82357	119725
2018-19	31146	1432	9038	41616	13590	62571	657	3166	79984	121600
2019-20	37431	1795	9735	48961	8205	60753	662	2457	72077	121038
2020-21	37144	1922	10936	50002	7079	68896	727	2550	79252	129254
2021-22	33449	2374	18304	54127	6596	76154	0	4411	87161	141288

Notes: The Table 1 shows Source Wise Energy Generation (GWh). Energy mix has changed From Public to Private and from Hydro to Thermal. Pre 1982, there was no private energy generation. Post 1997, the private energy generation was 3/4th of total energy generation in Pakistan.

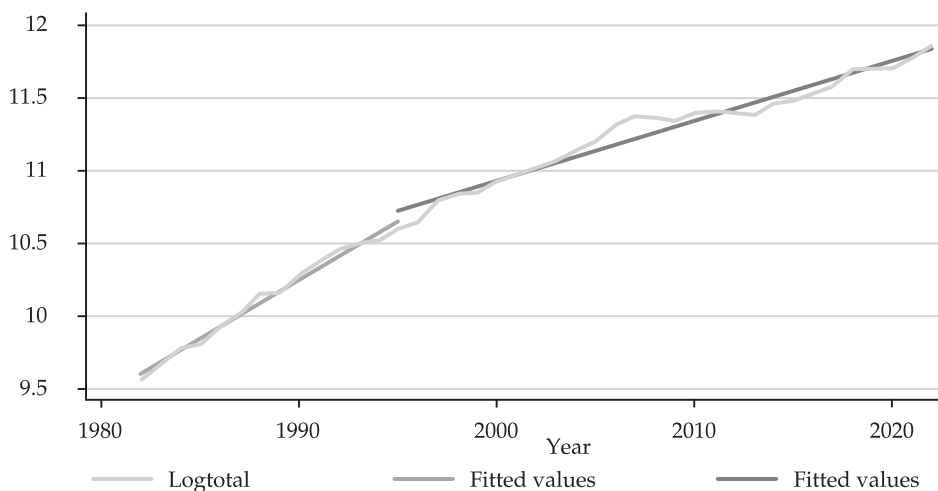
Source: NEPRA and NTDC.

Table 2: Public and Private Energy Generation (GWh)

Year	Public		Private		Total
	GWh	Percentage (%)	GWh	Percentage (%)	GWh
1981-82	14,186	100%	0	0%	14,186
1982-83	15,920	100%	0	0%	15,920
1983-84	17,559	100%	0	0%	17,559
1984-85	18,152	100%	0	0%	18,152
1985-86	20,465	100%	0	0%	20,465
1986-87	22,309	100%	0	0%	22,309
1987-88	25,704	100%	0	0%	25,704
1988-89	25,751	100%	0	0%	25,751
1989-90	29,078	100%	0	0%	29,078
1990-91	31,951	100%	0	0%	31,951
1991-92	34,657	100%	0	0%	34,657
1992-93	36,268	100%	0	0%	36,268
1993-94	36,930	100%	0	0%	36,930
1994-95	40,016	100%	0	0%	40,016
1995-96	41,663	100%	161	0%	41,824
1996-97	37,926	78%	10740	22%	48,666
1997-98	37,260	73%	13580	27%	50,840
1998-99	36,217	70%	15326	30%	51,543
1999-00	38,352	69%	17418	31%	55,770
2000-01	35,559	61%	22836	39%	58,395
2001-02	39,223	65%	21573	35%	60,796
2002-03	43,209	68%	20755	32%	63,964
2003-04	49,943	72%	19036	28%	68,979
2004-05	50,064	68%	23316	32%	73,380
2005-06	55,400	68%	26639	32%	82,039
2006-07	55,377	63%	32259	37%	87,636
2007-08	51,488	60%	34570	40%	86,058
2008-09	48,262	57%	35887	43%	84,149
2009-10	30,587	34%	58084	66%	88,671
2010-11	34,920	39%	55386	61%	90,306
2011-12	33,015	37%	56369	63%	89,384
2012-13	33,656	38%	53948	62%	87,604
2013-14	36,504	39%	58227	61%	94,731
2014-15	37,578	39%	59359	61%	96,937
2015-16	38,168	38%	63381	62%	101,549
2016-17	37,960	35%	69140	65%	107,100
2017-18	37,368	31%	82357	69%	119,725
2018-19	41,616	34%	79984	66%	121,600
2019-20	48,961	40%	72077	60%	121,038
2020-21	50,002	39%	79252	61%	129,254
2021-22	54,127	38%	87161	62%	141,288

Notes: Table 2 shows public and private source wise energy generation (GWh). In 1997 public constituted 78 % of energy generation as compared to 22 % of energy generation by the private sector. Compared to 2022 where public sector constituted 38 % of energy generation as compared to 62 % of energy generation by the private sector. This clearly exhibits that the energy mix has changed from the public to the private sector. Source: NEPRA and NTDC.

**Figure 4: Substitution of Public Sector Investment by Private Sector
Investment in Electricity Generation**



Regression Equations – log Total (Public + Private)	
Pre 1996	$\log \text{ total} = -150.77 + 0.08 \text{ year}$
Post 1996	$\log \text{ total} = -69.80 + 0.04 \text{ year}$

The cost of production of electricity

The second indicator for evaluating the efficiency hypothesis is the cost of electricity production, comparing public and private sector performance. Privatization was expected to reduce costs through economies of scale, but the data does not support this claim. Table 3 and Figure 5 provide comparative production costs for 2006–2023. In 2006, the public sector's cost of electricity generation was PKR 2 per kWh, while the private sector, operating for a decade by then, produced electricity at PKR 8 per kWh— four times higher. By 2023, public sector costs rose to PKR 17 per kWh, but private sector costs increased even more sharply to PKR 31 per kWh.

We now have a three-agent game, with possible welfare gains for consumers and public and private sector producers. However, there have been no efficiency gains which can be passed on to enhance consumer welfare. The private sector's generation costs have consistently exceeded those of the public sector, reaching nearly twice the cost by 2023. This indicates that privatization has not led to the expected cost reductions or efficiency improvements that could benefit consumers.

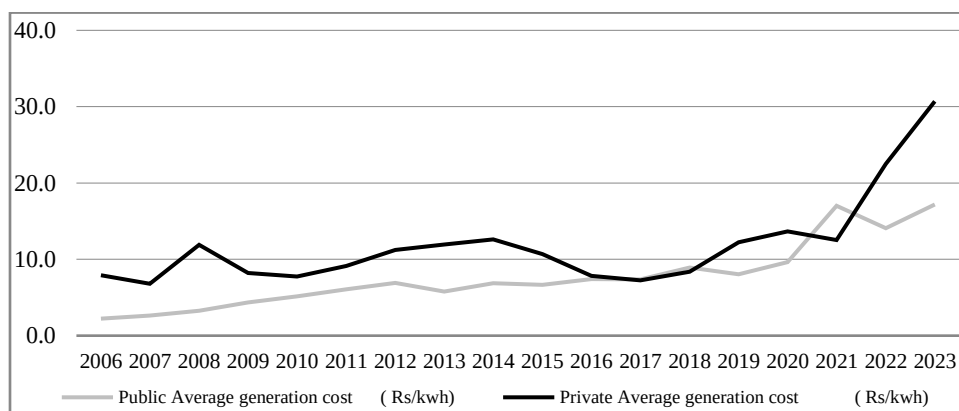
Table 3: Estimated Average Generation (Public Vs. Private)

Table 3: Estimated Average Generation cost Public vs. Private from FY 2006 to 2023		
	Public Average generation cost (Rs/kwh)	Private Average generation cost (Rs/kwh)
2006	2.2	7.9
2007	2.7	6.8
2008	3.3	11.9
2009	4.4	8.2
2010	5.2	7.7
2011	6.1	9.2
2012	6.9	11.2
2013	5.8	11.9
2014	6.9	12.6
2015	6.6	10.7
2016	7.4	7.8
2017	7.4	7.3
2018	8.9	8.4
2019	8	12.2
2020	9.7	13.7
2021	17	12.5
2022	14.1	22.5
2023	17.2	30.7

Source: Authors own calculation

Note: Table 3 shows estimated Average Generation cost Public vs. Private from FY 2006 to 2023. In 2006, the Private Sector Generation Cost was much higher than the Public sector Generation Cost. Source author's estimation based on data from State of Industry report (2006 to 2023), NEPRA, Power System Statistics (48th Edition to 38th Edition), NTDC and Electricity Marketing Data, NTDC.

Figure 5: Estimated Average Generation cost Public vs. Private from FY 2006 to 2023



Note: Figure 5 shows estimated average generation cost public vs. Private from FY 2006 to 2023. Private sector generation cost is much higher than public sector generation cost.

Source: state of Industry Report (2006 to 2023), NEPRA, power system statistics (48th edition to 38th edition), NTDC and electricity marketing data, NTDC.

Financial cost of generation to the Government of Pakistan

We now examine the third indicator to examine the financial cost to the GOP and, ultimately, to consumers, focusing on payments made to IPPs from the GOP.

Figure 6 estimates gains for public- and private-sector electricity producers from 2014 to 2025, using a methodology outlined in Box 1. The total power purchase price is divided into two components: the energy purchase price (EPP), representing production cost and capacity purchase price (CPP), which the GOP pays private producers for installed capacity, regardless of actual electricity generation. The capacity purchase price effectively serves as a guaranteed gain for private producers.

Table 4 shows that in 2014, the capacity producer price was a small fraction of the energy purchase price. However, by 2025, this capacity producer price is projected to double the purchase price, doubling the gains for private electricity producers.

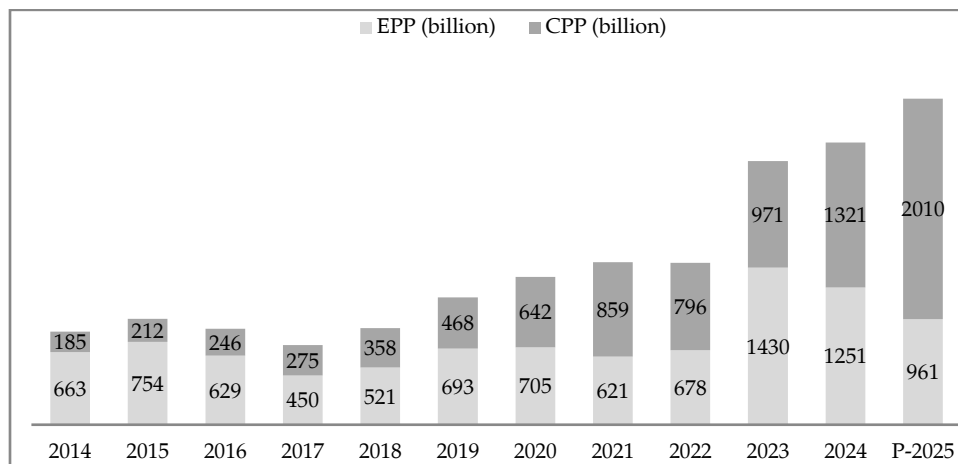
The government of Pakistan is paying high financial costs to IPPs. The share of CPP is increasing relative to the share of EPP, resulting in the government paying high-capacity charges. Consequently, consumers are burdened with higher electricity rates per unit.

Table 4 : Energy Purchase Price (EPP) Vs. Capacity Purchase Price (CPP)

Year	Energy Purchase Price EPP (billion)	Capacity Purchase Price CPP (billion)	Power Purchase Price PPP (Billion)
	A	B	A+B
2014	663	185	848
2015	754	212	966
2016	629	246	875
2017	450	275	725
2018	521	358	879
2019	693	468	1161
2020	705	642	1347
2021	621	859	1480
2022	678	796	1474
2023	1430	971	2401
2024	1251	1321	2572
P-2025	961	2010	2971

Source: Ministry of Energy, GOP

Figure 6: Energy Purchase Price, Capacity Purchase Price and Power Purchase Price



Note: Figure 6 shows PPP (Power Purchase Price) = EPP (Energy Purchase Price) + CPP (Capacity Purchase Price). The share of CPP is increasing relative to the share of EPP, resulting in a sharp increase in the PPP.
Source: Ministry of Energy, GOP

Box 1: Components of capacity purchase price (CPP) and energy purchase price (EPP).

The CPP comprises:

- Project Debt payments (inclusive of interest and principal).
- Return on Equity over the project life.
- Fixed element of the Operating and Maintenance Cost.
- Insurance Cost for the plant.
- Foreign Exchange Risk Insurance Cost (FERI), which is the cost of hedging the loans against foreign exchange risk.

The EPP comprises:

- Fuel Cost, which is set by the Government of Pakistan and is above the world oil prices by an amount of a surcharge.
- Variable element of the operating and maintenance cost.

$$\text{Power Purchase Price} = \text{Energy Purchase Price} + \text{Capacity Purchase Price}$$

Note: definition from Power Purchase Price Forecast, Central Power Purchasing Agency (CPPA), Pakistan

Conclusion and Policy Recommendations

There are two parts to the private efficiency argument. Firstly, the more efficient private sector should be allowed to substitute for the less efficient public sector, enabling cheaper costs of production and welfare gains for consumers. This has not happened in power generation in Pakistan. The private sector electricity generation costs have been much higher, burdening the consumers with high electricity prices, resulting in welfare losses. Consequently, the efficiency hypothesis supporting privatization appears ineffective in Pakistan's energy sector, highlighting a need for reform. The government faces two potential paths: restructuring the private sector or regaining control over the electricity sector under public ownership.

Secondly, the private efficiency argument posits that public investment crowds out private investment. However, this has not happened in Pakistan. Public investment dropped post-1992, but private investment failed to substitute for this drop, reducing aggregate investment and GDP growth. Instead of crowding out, public investment appears to have crowded in private investment (Ikram, 2022).

This investment behavior can be explained by the regulatory policy environment developed since the 1990s. It was strongly influenced by multilateral advice, particularly from the IMF under loan agreements to address fiscal deficits. These policies mis-sequenced reforms like opening the capital account prematurely, leading to the advent of increased capital outflows. This undermined private investment's ability to compensate for reduced public investment.

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10

Pakistan's "Export or Perish" Challenge – Institutional Dimensions

Jamshed Y. Uppal¹

Abstract

The paper analyzes the underlying reasons for the country's recurrent balance of payment crises using the framework of institutional economics and systems theory. It addresses the institutional challenges in expanding exports in the long term. A systems approach shows how the institutions are embedded in belief systems and mental models (social and cultural values and norms). Some mitigating factors that can weaken the balancing feedback loop are discussed. The analysis indicates that the elites and the belief systems encapsulated in culture and social values play a critical role in institutional change. Therefore, strategies to break out of the vicious cycle, balance of payment crisis-IMF bailouts, need to pivot on these two dimensions. There is a need to develop long-term strategies which would incorporate measures to strengthen economic, political, and social institutions.

Introduction

As Pakistan recovers from a near-default experience and initiates another IMF program, an opportunity arises to restore macroeconomic stability and address persistent structural imbalances. Given the country's continued reliance on imports, there is a compelling rationale for adopting an export-led growth strategy, encapsulated in the phrase "export or perish." While extensive analysis exists on economic policies needed to boost exports, this paper adopts a broader approach by examining the institutional challenges and referencing established research from New Institutional Economics and Dynamic Social Systems.

In discussions of Pakistan's complex economic challenges, limited attention has been paid to the country's political, economic, and social institutions, with solutions

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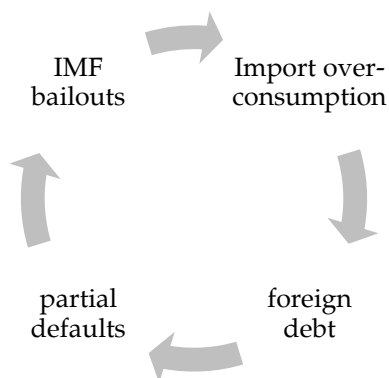
often focused on the short term. For sustainable, long-term progress, insights from institutional economics and complex systems theory offer coherent and complementary frameworks for addressing structural change.

The following section describes the dynamics of the recurring foreign exchange crises, attributing their origins to a consistently high propensity for imports, which underscores the necessity of expanding exports. Adopting a top-down approach, Sections 3 and 4 present analytical frameworks from new institutional economics and social dynamic systems models to analyze institutional change. Political and economic institutions directly influence export policies, while political failures, governance challenges, and corruption significantly hinder the adoption of effective export expansion strategies. Additionally, the cultural and social environment, by shaping belief systems, can either facilitate or impede institutional change. Section 5 explores how specific trade growth issues—such as exchange rate policy, export financing, global competitiveness, participation in global value chains, and the impact of cultural proximity on international trade—are embedded within political and economic institutions. Section 6 addresses the nexus between exports, foreign direct investment and capital flows. The final section provides a summary and conclusion.

A Vicious Cycle

Pakistan's economy appears trapped in a *vicious cycle* of import-overconsumption, financed by foreign debts, leading to periodic balance-of-payments crises, partial defaults, and repeated reliance on IMF bailouts as illustrated in Figure 1.

Figure 1: Vicious Cycle of BOP Crises



The most recent external financing caused severe economic strain, as the IMF program initiated in 2019 faltered, resulting in stalled economic growth, rising inflation, and pushing large segments of the population below the poverty line. Most

notably, Pakistan's external account came under severe pressures due to stagnant exports, high import dependency and a drop in faced significant pressure due to stagnant exports, high import dependency and a decline in foreign direct investment. This culminated in a near-default situation, which was averted only by an emergency stand-by arrangement with the IMF in mid-2023.

The country's recurrent BOP crisis suggests a systemic failure arising rooted in deep structural and institutional factors. The IMF programs primarily aim to rationalize fiscal and monetary policies, expand the tax base by incorporating retail, agriculture, and export sectors and eliminate exemptions and subsidies. The importance of adopting a market-determined foreign exchange rate has been repeatedly emphasized. Although these measures and program conditionalities have been attempted in previous programs, Pakistan has not succeeded in breaking this vicious cycle. The implementation of necessary structural reforms has remained elusive and politically challenging. Therefore, it is essential to examine whether the roots of these economic crises are deeply embedded in the political and cultural realms. To better understand the foundations of this chronic economic malaise, insights can be drawn from disciplines at the intersection of economics, politics, and culture. In this regard, New Institutional Economics and Dynamic Social Systems offer valuable perspectives.

Roots of Import Dependence

The country's dependence on imports has persisted due to several strong underlying factors (Uppal, 2023).

- a) The country is heavily reliant on imports for essentials and necessities, such as energy. Even domestically produced goods have a significant indirect import content. This dependence is likely to increase in the future (Mangla and Uppal, 2014; and Uppal and Khalid, 2019).
- b) There is a strong consumers preference for foreign products, driven by the convergence of lifestyles across countries as a result of globalization.
- c) Foreign products embody technology, providing a competitive advantage to local producers in both domestic and international markets.
- d) Foreign Direct Investment (FDI) requires profit repatriation or debt servicing at a later stage, thereby increasing demand for foreign exchange.

An Asian Development Bank (ADB, 2023), working paper analyzes Pakistan's recurring balance-of-payments crisis using data from 1980 to 2017 and long-term estimates of import and export income elasticities. The empirical evidence suggests that Pakistan's BOP constrains its economic growth rate to an estimated 3.8%. The authors conclude that, "in the current structural and product specialization circumstances, if Pakistan's economy is to grow faster than 3.8% in the medium-

term, external imbalances will occur.” This growth constraint at a relatively low level is driven by a high income-elasticity of imports, estimated at 0.8, meaning a 1.0% increase in GDP leads to a 0.8% increase in imports. “On the other hand, stagnating value of exports since 2012 and slowing remittance growth since 2014 are likely further shifting the BOP equilibrium growth rate downwards.”

Given Pakistan’s persistent high propensity to import, shifting to an export-led growth strategy is widely viewed as the most viable path forward, encapsulated in the slogan *export or perish*. It remains to be seen how such a shift in economic policies will unfold within the institutional context. For this reason, we now turn to relevant concepts from New Institutional Economics, Dynamic Social Systems and Cultural Economics.

New Institutional Economics

According to the New Institutional Economics (NIE) literature, institutions are created to reduce uncertainty by structuring the environment and generating predictable behavior, thereby constraining members to adhere to both formal and informal rules. These structures, known as institutions, emerge from ongoing social interactions and are shaped by the dominant beliefs within a society. Beliefs systems influence how individuals’ perceptions of reality and their responses; however, the beliefs held by those in power (*dominant beliefs*), have a greater impact on institutional development. Thus, belief systems provide “both a positive model of the way the system works and a normative model of how it should work”; North (2005, 2).

Institutions generally evolve incrementally but can also change episodically, as influential actors revise their perception of reality and institutional performance according to their subjective criteria, which usually relate to generating economic benefits for themselves and their social groups. Significant change often occurs when new actors acquire legitimacy, influence and power. Institutional change is far from quick or easy. The rate of institutional change depends on the degree of competition among organizations and their entrepreneurs.

Systems Approach

Another relevant field for understanding institutional emergence and change is the Science of Complexity. Complex Social Dynamic Systems or Complex Adaptive Systems (CAS) have contributed to the development of complexity economics, which views the economy as a network of evolving, interacting agents. In this framework, the adaptive behavior of the economy results from the individual adaptations of its agents. Although the behavior of individual actors is unpredictable, certain repeating and persistent behavioral patterns emerge over time, providing stability and allowing for the anticipation of likely actions. These

stable patterns eventually create structures that influence and constrain behavior. Some of these structures are formalized as organizations, regulations and legislation, while others remain s informal as customs and social norms. In Complexity Science, such structures are called attractors and boundaries, whereas in social sciences, they are referred to as institutions.

The theories of institutional economics and of complex systems reach very similar conclusions about how institutional structures shape relatively persistent patterns of behavior.

As institutions emerge in a society, they establish 'the rules of the game' governing personal interactions between agents as well as interactions among organizations, firms and government. Institutional structures shape the competitive environment in an economy. A major benefit to the economy is the reduction of transaction costs and the creation of positive externalities, such as enabling specialization of production. Institutions build the incentive structure for economic units, for example, relating to investment, innovation, defining and protecting property rights. Effective institutions are essential for a market economy to operate efficiently; market exchanges are regulated and governed not only by laws and regulations but also by local customs and norms.

Figure 2: Systems Iceberg Model

Events	FX Crisis
Patterns	Vicious Cycle – BOP crisis
Structures	1) Organizations: Corporations, governments, schools 2) Policies: laws, regulations, taxes 3) Rituals: customs, norms, habits
Paradigms	Attitudes, beliefs, morals, values underpin the structure

A valuable tool to conceptualize and map the institutional structure in an economy is the Systems Iceberg Model. It differentiates between what is directly

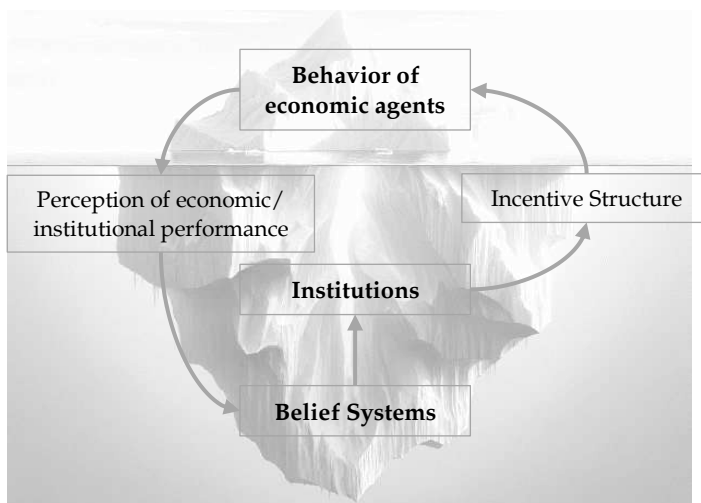
observable (the events and patterns that these events follow, thus above water) and what remains unobservable but drives these patterns, consisting of structures or institutions and their underlying mental models or paradigms. These mental models or paradigms, also called society's belief systems, shape people's perception of reality and drive their responses. A simple Systems Iceberg Model is shown in Figure 2.

The model shows at the tip of the iceberg events, such as the BOP crises, observed from time to time. Below these, persistent patterns of behavior, which repeat in a similar manner (recurrent IMF bailouts), are also detectable. Beneath the surface lie systems structures that are not easily visible. These structures can be physical (infrastructure, terrain, roads, etc.), but more importantly include formal and informal institutions encompassing organizations, policies (laws, regulations, tax code, etc.) and rituals (customs, norms, habits, etc.). At the deepest level, underpinning the structures are mental models that include attitudes, beliefs, morals and values.

The dynamics of institutional change

Based on Jenal (2019), Figure 3 replaces the terms Patterns, Structures and Paradigms from the general iceberg model with the parallel concepts used in New Institutional Economics: behavior of economic actors, institutional frameworks, and belief systems. The figure also introduces arrows to illustrate the theoretical causality proposed by North (2005).

Figure 3: Dynamics of institutional change per Jenal (2019)



North posits that institutional change is driven by powerful and dominant actors, who assess the performance of economic agents according to their own criteria. Change can also occur when new actors acquire influence and power, rather than through existing power structures revising their perceptions. As influential actors evaluate institutional performance and adjust their perceptions and belief systems, institutional change occurs through a feedback loop. Beliefs shape the structure and evolution of institutions, which in turn influence the behavior of economic actors through incentive structures, thereby affecting economic performance.

Factors that mitigate institutional change

Several factors mitigate the feedback loop and slow down the process of institutional change. First, the way we perceive and evaluate institutional performance is shaped by our prior belief system, which are anchored in earlier experiences and entrenched in the cultural and social environment. This makes it difficult to think outside the box and creates a balancing loop that hinders institutional change and may even lead to institutional stagnation.

Secondly, since change agents are typically influential and powerful actors, even if economic performance is suboptimal from a societal perspective, decision makers may not perceive it as such; their belief systems can render them blind to these shortcomings. For example, powerful elites may fail to comprehend the hardships faced by the impoverished because they cannot relate to their reality. This phenomenon, known as elite capture, is well-documented phenomenon where a small powerful group evaluates the system according to its own class interests rather than broader societal needs.

A third factor that may mitigate the balancing feedback is that belief systems can become entrenched within ideological boundaries, making it much harder to revise perceptions of institutional performance or reevaluate institutions. For example, if a society is ideologically committed to socialism, it will be very difficult to question the performance of publicly owned enterprises, as doing so may seem to challenge the ideology's foundation and hinder change even when evidence supports it. In Pakistan, any discussion about opening relations with its neighbor, is thus severely constrained.

Fourth, institutional change also depends on the adaptive efficiency of institutions and the legal and regulatory framework in which they operate. Formal institutions may change relatively faster, though the process is political and subject to negotiations that can considerable time. Social norms, on the other hand, tend to evolve more slowly. The overall speed of change varies across societies; some cultures are more open to change, while others are more conservative or resistant. However, social and cultural change can be accelerated, especially when political

and civic leaders raise awareness about the need for reform. The power structures within society and the internal structure of institutions also influence the pace of adaptation and change. According to North, institutional change is primarily driven by elites with influence and power. Thus, powerful groups or classes make decisions about institutions, policies, rules and regulations, thereby defining the incentive system for businesses and individuals. The challenge is to align the interests of decision makers with those of society at large, which can be achieved by creating a more democratic and pluralistic society that allows broader participation in decision-making through informed, fact-based discussions. Conversely, when a small group holds power, they are likely to resist institutional change, as the existing system disproportionately benefits them at the expense of the majority.

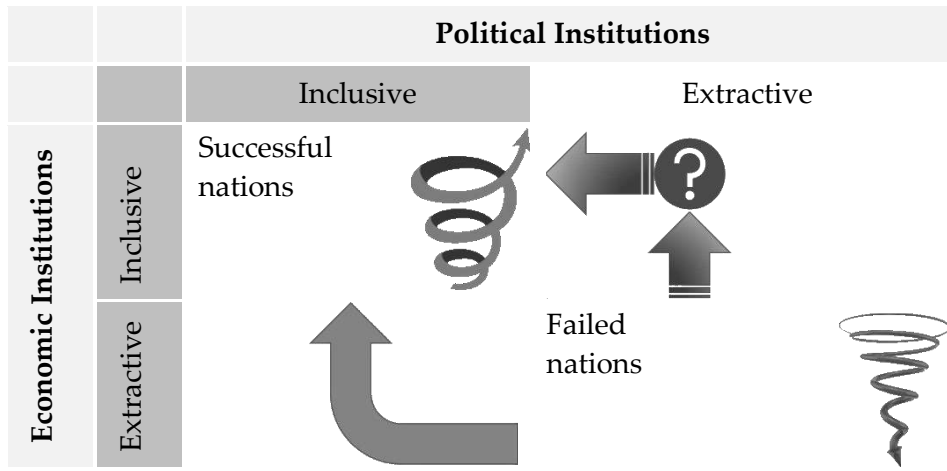
These larger dynamics that mitigate institutional change have been termed by Acemoglu and Robinson in their book *Why Nations Fail* as the vicious and the virtuous circles (Acemoglu and Robinson, 2013).

Extractive vs. Inclusive Institutions

One way of looking at the role institutions play in advancing or hindering economic progress is to characterize them as to whether they are extractive or inclusive in nature.

In their seminal work *Why Nations Fail*, Acemoglu and Robinson argue what determines whether a nation progresses or not is grounded in its institutions; it depends on whether its political and economic institutions are extractive or inclusive. Inclusive institutions are pluralistic, participatory and provide incentives for people to be innovative and engage in business. They create an environment for markets to function, which includes secure property rights and a just system of law and order. These institutions provide public services that ensure a level playing field, allowing people to conduct economic exchange and contract. Most importantly, the institutions permit the entry of new businesses. Extractive institutions, on the other hand, concentrate power in the hands of an elite who restricts opportunities, safeguards oligarchical power to extract value and benefit themselves to the detriment of innovation and emergence of new industries. The creative-destructive process at the heart of economic progress is thus disrupted. Their theoretical framework is depicted in Figure 4.

Figure 4: Institutional Landscape-Acemoglu and Robinson



The interplay between political and economic institutions can set in motion either a virtuous or a vicious cycle. Successful nations are those where both political and economic institutions are inclusive, generating a virtuous cycle. In this cycle, inclusive political institutions enable inclusive economic institutions because they involve pluralistic decision-making, making them resilient to attempts by interest groups to capture political and economic power through extractive institutions. An example of the virtuous circle is the rule of law, which according to Acemoglu and Robinson, "is not imaginable under absolutist political institutions. It is a creation of pluralist political institutions and of the broad coalitions that support such pluralism;" (Acemoglu and Robinson, 2013). Inclusive economic institutions, in turn, reinforce inclusive political institutions creating a self-reinforcing cycle that supports sustained development and stability.

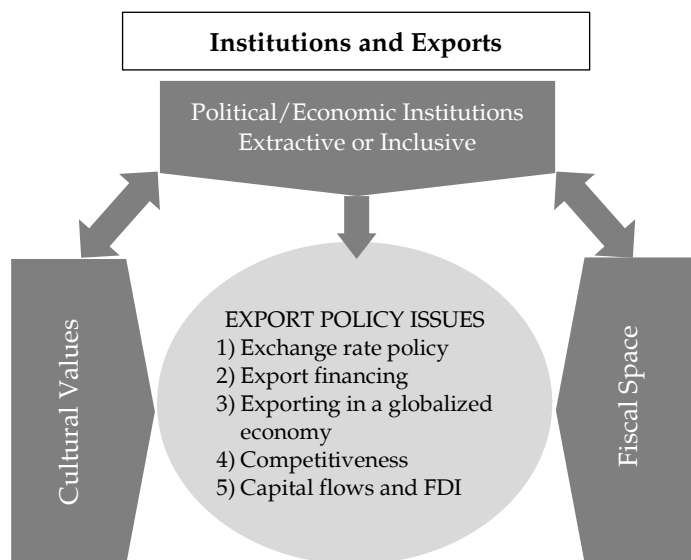
Extractive political and economic institutions, conversely, generate a vicious circle in which each reinforces the other, enhancing their resilience. Elites in power benefit from extractive economic institutions and sustain their dominance through extractive political institutions. Consequently, there is little incentive to reform institutions or make them more inclusive. Although these vicious cycles may occasionally be disrupted due to internal conflicts, extractive institutions remain vulnerable to infighting. However, as the authors emphasize, "The essence of the iron law of oligarchy this particular facet of the vicious cycle is that new leaders overthrowing old ones with promises of radical change bring nothing but more of the same;" Acemoglu and Robinson (2013)².

² The "iron law of oligarchy" states that all forms of organization, regardless of how democratic they may be at the start, will eventually and inevitably develop oligarchic tendencies, thus making true democracy practically and theoretically impossible, especially in large groups and complex organizations.

According to Acemoglu and Robinson, while institutional change is possible, it is often difficult due to powerful balancing feedback loops that impart stability to the existing institutional landscape, reinforcing either a vicious or virtuous cycle. This stability does not mean change is impossible; the authors provide numerous historical examples of countries transforming their institutions from extractive to inclusive.

In terms of the sequence of change, their analysis suggests that it is generally easier to move from exclusive to inclusive political institutions first, which can then pave the way for inclusive economic institutions. The alternative path—developing inclusive economic institutions before inclusive political institutions, as proposed by the modernization hypothesis³—is more challenging, tend to resist reforms and maintain extractive economic arrangements.

Figure 5: Institutions and Export Policies



Acemoglu and Robinson (2013) conclude: “Despite the vicious circle, extractive institutions can be replaced by inclusive ones. But it is neither automatic nor easy. A confluence of factors, in particular a critical juncture coupled with a broad coalition of those pushing for reform or other propitious existing institutions, it often necessary for a nation to make strides toward more inclusive institutions. Some luck is key, because history always and folds in the contingent way.”

³ The modernization hypothesis is a theory that suggests that a country's economic development can lead to political and social change, and that more economically developed countries are more likely to be democracies, Gwynne (2009).

Institutions and Exports

Having laid out a generalized framework describing how institutional factors influence economic policy making and performance, we can now turn to their role in issues related to export promotion strategies. A country's political and economic institutions directly impact major export policy areas such as exchange rate policy, export financing, exporting in a globalized world, export competitiveness, capital flows and foreign direct investment. This analytical framework is illustrated in Figure 5.

Exchange Rate Policy

At the macro level, as the first step in encouraging exports and curtailing domestic consumption of imported products, foreign exchange policy needs to reflect the expected demand for hard currencies. This implies that the foreign exchange rate should be closely aligned with the market determined rate.

On the contrary, there is empirical evidence that the Pakistani rupee suffers from *chronic overvaluation* (Ahmed, 2009); Makhoulouf and Mughal, 2013; Javaid, 2009; Jalil, 2020; Lopez et al., 2007). Pakistan's economy seems to be afflicted by Dutch Disease, as the country has been receiving inflows of hard currencies from sources other than exports of goods and services, such as workers' remittances and foreign aid. On average, workers' remittances have been almost as large as exports, which is a major cause of the rupee's overvaluation and, consequently, the loss of competitiveness in Pakistan's export sector. Imports are encouraged while exports are penalized. This leads to an increase in the share of the non-tradable sectors in the economy, such as real estate, and capital flight out of the country.

The failure to rationalize foreign exchange policy in line with scholarly analysis and policy recommendations can be understood through the institutional framework. First, the persistent overvaluation of the rupee not only disadvantages the exporters but also shortchanges ex-patriate workers and their families, who see the value of their remittances eroded. Conversely, the main beneficiaries of this policy are urban elites and upper middle-class consumers, who enjoy cheaper imported goods, energy and luxuries. This group, rather than exporters or expatriate workers, holds significant influence and power, and thus has little incentive to support policy change. Second, at the level of belief systems, the notion of a *strong rupee* has become a symbol of national pride and a perceived indicator of government economic performance, even though it undermines the export sector.

Financing for Export Promotion

Finance plays a key role in facilitating international trade, since working capital cycles are longer than in domestic trade. The export sector is also more exposed to

credit risk and defaults from foreign customers. A lack of access to trade finance is a significant non-tariff barrier to trade (Asian Development Bank, 2023; World Trade Organization, 2016).

To expand in the international markets and remain competitive, exporters need to invest in physical capital and technology, particularly for higher value-added products. Over time, production processes have become more capital-intensive, involving large-scale automation and robotics to ensure high quality. Therefore, lack of access to finance can severely constrain exporters from investing in plants, machinery and human capital needed to grow and compete.

The State Bank of Pakistan (SBP) has two major programs: the Export Finance Scheme (EFS) and the Long-Term Finance Facility for Plant & Machinery (LTFF). The first provides short-term working capital loans, while the second offers long-term loans for investment in machinery and equipment.

A study by Defever, Riaño and Varela (2020) evaluates the impact of the two SBP facilities—EFS and LTFF—on firm-level export performance. The study shows that firms benefiting from these financing facilities are substantially larger, export a large share of products, and are concentrated in traditional sectors such as clothing, textiles and apparel. While the schemes have helped expand exports of individual firms (*intensive margin*), neither scheme has helped increase the range of products being exported nor the number of destination countries (*extensive margin*). The impact of the facilities has been weaker in Pakistan compared to similar schemes in other countries. From a simple *back-of-the-envelope* cost-benefit analysis, the authors conclude that “Our evaluation indicates that from a fiscal standpoint, EFS and LTFF offer an expensive way to increase tax revenues because they offer loans to firms at negative real interest rates.” A similar study by Zia (2008) finds that approximately half of the subsidized credit appears to have gone to large and financially unconstrained firms.

The empirical evidence suggests that trade promotion policies are driven by influential groups rather than by economic merit. Malik and Duncan (2022) find that sectors exposed to politically powerful businesses have disproportionately benefitted over the last 20 years through a complex mix of tariff and non-tariff measures. Pakistan has one of the most protectionist trade policies in the world, creating an anti-export bias (World Bank, 2021) which may also reflect the extent of elite capture of the state.

Achieving Global Competitiveness

The share of Pakistan’s exports in GDP has been declining. One major underlying factor is the decreasing relative competitiveness of the country’s exports. There is also a relatively low entry rate into the export sector, coupled with a high failure rate

among new entrants attempting to upscale their business. As a result, there has been little diversification or sophistication in exports.

A World Bank (2021) report notes that the economy has become more inward-oriented, which carries consequences for the country's foreign exchange, employment, and productivity growth. The report identifies three main causes of Pakistan's stagnant exports. First, protectionist policies aimed at import substitution create an anti-export bias, incentivizing domestic firms to prioritize local markets over export markets. Second, support services for exporters, particularly long-term finance and market intelligence, have been inadequate. Third, low productivity of Pakistani firms is a major factor underlying their unfavorable competitiveness.

As per international business literature (Porter, 1998), achieving competitiveness in global markets generally follows from first becoming competitive in local markets. Porter's main thesis is that "companies achieve competitive advantage through acts of innovation. Their capacity and push to innovate is affected by four broad attributes of a nation, attributes that constitute the *diamond* of national advantage: (i) Factor conditions, (ii) Demand conditions, (iii) Related and supporting industries, (iv) Firm strategy, structure, and rivalry. These four attributes create the national environment in which companies are born and learn how to compete," Porter (1990). The competitive advantage thus gained locally is then leveraged to enter foreign markets. This local completeness arising out of productivity, innovation and efficiency is achievable only in a competitive economic environment, which often conflicts with protectionist policies. Based on Porter's analysis, "government should act as a catalyst and challenger—but not get involved directly in competition. Companies should create pressures for innovation; seek out the toughest competitors and most-demanding customers; improve the whole national diamond; and use alliances only selectively," Porter (1990). He also notes that "as the basis of competition has shifted more and more to the creation and assimilation of knowledge, the role of the nation has grown."

A competitive business and economic environment needs to be embedded within a competitive social and cultural environment. The issue of a competitive environment, therefore, circles back to mental models and belief systems. It implies building societal values that favor equal opportunity, innovation and creativity, create merit-based incentive systems for individuals as well as for businesses; and protect property, individual freedom, and rights within a fair and just legal framework.

Becoming a Part of Global Value Chains

In a globalized world, supply chains have become complex and cross national boundaries. Increasingly, firms participate in international trade by becoming links in global value chains (GVC). Public policy can play a critical role in facilitating local

firms' engagement with these global networks, such as by reducing import duties and other indirect costs involved in international trade, thereby improving the ease of doing business.

According to a joint report of the Asian Development Bank and Islamic Development Bank Institute (ADB/IDB, 2022) Pakistan has the lowest GVC participation rates in the world. The report recommends the following measures to adopt a more outward oriented trade strategy: (i) incentivize exports of products that rely heavily on processing abroad; (ii) build up human capital appropriately to match the opportunities provided by GVCs in the export of services; (iii) provide institutional support to groups that might be adversely affected by opening up to GVCs; and (iv) continue to pursue new trade agreements to lower trade barriers, exchange information, and establish mutual trust.

In the globalized trading environment, multinational corporations are key to accessing global value-chains. Strategic alliances with multinational corporations can also be instrumental in gaining market intelligence, trade financing and investments to bring technology and to increase productivity (Lovo and Varela, 2020).

However, Pakistan has become increasingly inward-oriented since the turn of the century, which hampers its ability to integrate effectively into global supply chains (World Bank, 2021). The inward orientation is also reflected in cultural orientation and international relations, which have developed an anti-Western sentiment. To successfully promote exports, government policies must recognize and address these broader cultural and political factors influencing international trade.

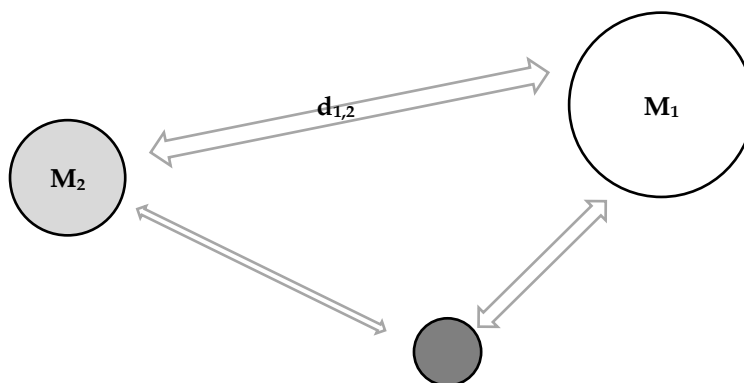
Cultural Closeness and Trade Potential

In international economics, the *gravity model* of trade (Figure 6)—first developed by Isard (1954)—has consistently proven robust in empirical testing (Carrère et al., 2020). This model explains that the volume of trade between countries is positively related to the product of their economic sizes and negatively related to the geographical distance separating them.⁴ Salinas (2021) highlights the need to reduce the *effective geographic distance* between trade partners by improving transportation logistics, easing trade barriers, enhancing trade facilitation, and leveraging communication technologies. The study also identifies four economy-wide factors—

⁴ The basic model for trade between two countries (i and j) takes the form $F_{i,j} = g \cdot \frac{M_i M_j}{D_{ij}}$, where g is a constant, F stands for trade flow, D stands for the distance and M stands for the economic weights of the countries i, j . Most scholars consider the distance in the model to be the effective rather than geographical distance, reflecting frictions impeding bilateral trade.

governance, education attainment, infrastructure quality, and open trade policies (*horizontal policies*)—as essential drivers for fostering diverse, complex, and higher-value-added non-commodity exports.

Figure 6: Gravity Model of Trade



Other scholars have suggested that psychic or cultural distance plays a greater role than geographic distance in explaining bilateral trade patterns (Håkanson, 2014); Horner et al., 1970; Vahlne and Wiedersheim, 1973). This perspective highlights how differences in societal norms and customs shape cultural closeness, which can either facilitate or impede trade between countries.

For policymakers, this implies the need to assess whether their country is culturally drifting away from key trade partners or becoming increasingly isolated, as such cultural gaps can pose substantial barriers to expanding trade. Cultural factors end to exert a stronger influence on trade in knowledge-intensive products and services-sectors that hold considerable promise for growth and diversification.

Foreign Direct Investment and Exports

A fundamental characteristic of foreign direct investment (FDI) is that it entails an obligation to repatriate foreign exchange later as debt servicing and/or profits. Therefore, the litmus test of FDI should be whether it increases the country's FX earnings by expanding exports; the rate of return on FDI in foreign currency should be the key criterion. Typically, FDI brings an additional infusion of foreign exchange into the economy, as it is usually accompanied by imports of plant, machinery, and other services denominated in foreign currency.

The economic logic would therefore suggest that the FDI funded projects need to be carefully evaluated in terms of their export-building capacity. On the contrary, there seems to be an unqualified enthusiasm for FDI in private as well as official circles. Bringing FDI in has become a yardstick of the success of government's

economic policies. Such mental attitudes and beliefs seemed to be shaping the public policy towards FDI.

Following the internationalization theories—such as the OLI eclectic paradigm (Dunning, 1977, 1980, 1988) and the Uppsala model (Johansson and Vahlne, 1977, 1990)—FDI represents a stage in a foreign firm's decision to invest in physical facilities abroad. It emerges as mutual trust and business relationships deepen between the foreign firm and its local partners. Therefore, it is crucial to consider FDI from the foreign investor's perspective and understand the factors influencing their decisions.

Within the field of international business, the construct of psychic distance (and similar constructs, such as national cultural distance, institutional distance, and sociocultural distance), has been considered a potential predictor variable for a broad range of management decisions including FDI market selection (Davidson, 1980; Dow et al., 2009).

Cultural factors also play a prominent role in forming perceptions of a “friendly business environment” and country risk, which influence FDI flows. Unfortunately, Pakistan's perception among the international business and investor community has deteriorated over the last several decades, damaging its country brand. Negative perceptions have been fueled by rising terrorism, increasing Islamization of the society, and anti-West attitudes. Increasingly, credit rating agencies and country risk assessment agencies incorporate cultural and social factors into their analysis (Leavy, 1984).

Capital Flows – a Two-Way Street

Capital flows are another area where analyzing the institutional landscape, rooted in belief systems and cultural values, can provide valuable insights. Capital flight out of the country is often portrayed as the villain in political rhetoric and public discourse, which is reflected in regulatory controls on the flow of capital.

However, the issue is complex and involves economic trade-offs. First, there is an inherent contradiction in trying to attract foreign capital while simultaneously making it harder to move that capital out of the country. For liquidity reasons, a foreign investors' primary concern is their ability to repatriate capital when needed. Therefore, restrictions on capital outflows are likely to have a negative impact on foreign direct investment.

Capital flight can take many forms, such as over-invoicing, under-invoicing, smuggling, and use of cryptocurrencies, in addition to illicit financial flows. Multinational corporations may also move capital out by manipulating transfer prices and exploiting loopholes in tax codes.

It is important to recognize that firms and individuals have legitimate economic reasons to transfer capital abroad, including portfolio rebalancing, seeking safety, expanding business internationally, and maintaining funds overseas for operational purposes. Likewise, foreign investors are motivated to invest in local markets to optimize their risk-return profiles through foreign portfolio investment.

A balanced approach is needed to target money laundering and illicit gains while protecting the country's tax base, avoiding unintended harm to the investment climate. Coercive measures to restrict capital flows are likely to be counterproductive (Arezki et al., 2013). A prudent approach involves fostering a stable macroeconomic environment and allowing market-determined FX rates through sound policies. Political risk affects both domestic and foreign investors and is a major driver of the capital flight to safety. Ensuring long-term political stability and a reliable legal environment should be a priority. Conversely, if the country's policies are driven by entrenched anti-capital belief systems among political elites, the results will be counterproductive.

Summary and Conclusion

This paper analyzes the underlying causes of the country's recurrent balance of payments crises—a vicious cycle—within the framework of institutional economics and systems theory. It highlights the challenges faced in expanding exports over the long term and emphasizes the need for long-term strategies that strengthen economic, political, and social institutions.

The systems approach shows how institutions are embedded in belief systems and mental models (social and cultural values and norms). Institutions influence the behavior of economic agents through incentive systems. Economic outcomes are then evaluated by these agents who may revise their prior beliefs and, if influential, bring about institutional change. This creates a balancing feedback loop capable of correcting the system's course. However, several factors can weaken this corrective mechanism: (i) agents of change tend to be powerful and influential groups whose perceptions and interests dominate; (ii) their perceptions are bounded by prior beliefs and ideologies; and (iii) the adaptive capacity of institutions themselves. Thus, elites and the belief systems embedded in culture and social values play a critical role in institutional change. Strategies to break out of the vicious cycle of balance of payments crises and IMF bailouts must therefore focus on these two dimensions.

The first question to consider is how economic policies and strategies are developed. Political failure, governance challenges, and corruption often result in elite capture by vested interests, leading to policies that do not align with the public good. Evidence suggests that such elite capture is central to Pakistan's economic difficulties. Alavi (1972) highlighted the oligarchical control Pakistan's state by a

bureaucratic-military complex. More recently, Ahmed (2023) provided empirical evidence of political and bureaucratic capture in public sector resource allocation in Baluchistan. Similarly, Ahmed (2017) discusses state capture and extractive behavior of Pakistan elite.

Elite capture in Pakistan is highlighted in the World Bank's (2020) Systematic Country Diagnostic Report. Another World Bank (2022) report notes that, "... [these elite groups] have not supported policies that could have addressed factor market failures, as this would have diluted their own economic power and their grip over state resources." The report concludes that, "the effectiveness of reforms crucially depends on alleviating public governance environment constraints and ensuring incentive compatibility."

The second dimension of the problem lies in the belief systems embedded in the cultural and social environment. Sound policies are more likely to emerge when they are evidence-based, developed through informed dialogue, and free from ideology or beliefs lacking rational basis. Rational public policies, implemented within a stable political and economic environment, are essential for export growth. The influence of cultural factors on export performance cannot be overemphasized.

Economic progress is driven by innovation, risk-taking, and entrepreneurship-qualities that flourish in cultures that actively encourage, reward, and celebrate them. In today's globalized economy, cultural affinity with export markets and a deep understanding of customer expectations regarding quality and service have become critical competitive advantages. Success in global markets begins with building strong competitiveness at home, which can then be leveraged for international expansion. Export competitiveness—rooted in productivity, innovation and efficiency—is best cultivated within a dynamic and competitive domestic environment. With global supply chains growing increasingly complex and crossing multiple borders, integration into global value chains (GVCs) is essential. Broader economic factors—such as governance, high educational attainment, robust infrastructure, and open trade policies—play a vital role in enabling countries to diversify their exports and move towards higher-value, non-commodity products.

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Explaining Agricultural Growth in Pakistan

Anum Ellahi¹

Abstract

Agriculture sector is the second-largest contributor to Pakistan's GDP, accounting for 24%. This research paper examines agricultural growth in Pakistan from 1990 to 2020. Using the Cobb Douglas production function (Capital and Labor) the paper determines the dominant factors influencing agricultural growth. Agricultural growth has shown consistent growth from 1990 to 2020. The study finds that agriculture credit, fertilizer usage, labor and water availability have a significant and positive impact on agricultural output. These findings are further reinforced by per hectare production analysis, which reveals that agriculture credit per hectare, fertilizer usage per hectare, labor per hectare and water availability per hectare have a positive and statistically significant relationship with agricultural output per hectare. When comparing these results to elasticities, the paper concludes that only agricultural credit and water appear to have a significant and positive relationship with agricultural output.

Introduction:

The agriculture sector is a cornerstone of development in many developing countries. It serves as a primary source of employment, especially in rural areas, providing livelihoods and food security for a significant portion of the population. Beyond its role in food production, the success and growth of the agriculture sector contribute significantly to the national economy. A thriving agricultural sector fuels economic development by driving growth in manufacturing and services sectors. Understanding the factors that drive agricultural growth is crucial, particularly for countries like Pakistan, which heavily rely on this sector. By analyzing these factors, policymakers and researchers can develop strategies to enhance agricultural

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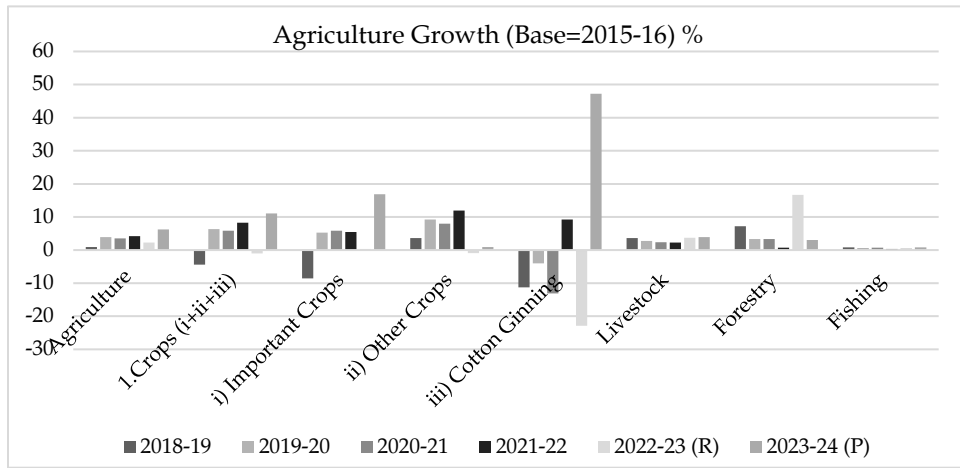
productivity, improve rural livelihoods, and contribute to overall economic development.

The significant role of agriculture in socio-economic development is evident in many countries. Early literature often focused on the passive linkage between agriculture and other sectors. For instance, Ranis and Fei (1961) posited that agriculture serves as a secondary factor in economic growth while the industrial sector is the primary driver of growth (Rosenstein-Rodan, 1943; Lewis, 1954). However, more recent perspectives, such as Subramaniam and Reed, (2009) emphasize the critical role of agriculture in rural populations' food security, livelihoods, and employment. Agriculture directly impacts the national economy and positively influences other sectors, improving the lives of many. By providing employment, reducing poverty and enhancing standards of living, agriculture fosters economic growth and development. Its linkages with other sectors further solidify its importance, as it supplies raw materials to industries, generates demand for industrial products, and contributes to urban development.

Pakistan, being an agrarian economy, derives a significant portion of its economic growth from agriculture. According to Punjab Bureau of Statistics (2023-24), this sector contributes 24% to the country's GDP, making it the largest sector of the economy. It provides direct and indirect employment to 37.4 million people. The Economic Survey (2023-24) further highlights the sector's importance, stating that it sustains the livelihoods of 68% of the population. With a population of 241.5 million in 2023, with 147.75 million people reside in rural areas, heavily reliant on agriculture. The Punjab Bureau of Statistics (2023) estimates that agriculture directly or indirectly contributes to 70% of export earnings (Pakistan Economic Survey 2023-24).

In the last fiscal year, Pakistan's agriculture sector productivity increased from 2.27% to 6.25%. Pakistan is the fourth-largest cultivator and supplier of rice, wheat, and cotton. Rice is one of the country's primary export crops (Pakistan Economic Survey 2023-24).

Figure 1: Agriculture Sector Performance



Source: Pakistan Economic Survey 2022-23

Despite the recent increase in agricultural productivity, Pakistan's agricultural sector has faced challenges in previous years, leading to a slowdown in overall growth. This slowdown can be attributed to poor total factor productivity, meaning that the output is not increasing proportionally to the inputs used. As Ahmad et.al (2013) pointed out, numerous challenges are impacting the sector's productivity and sustainability. Several factors contribute to these challenges including, water scarcity due to growing population, (Kahlowan & Majeed, 2003), rise in inflation, load shedding, high diesel prices, lack of crop insurance, inadequate post-harvest technologies and poor agricultural policies (Pakistan Economic Survey 2023-24; Sadaf et al., 2005; Shah & Farooq, 2000).

This paper aims to identify the key factors that driving real agricultural growth in Pakistan through time series analysis. Specifically, the paper seeks to determine the relative contributions of land, labour, and capital to agricultural growth. The paper is structured as follows: Section 2 reviews existing literature, Section 3 details the data, model and methodology. Section 4 presents the results, and Section 5 concludes with a discussion of the findings.

Literature Review

A substantial body of literature has explored the importance of agriculture and the factors driving its growth. Baig et al., (2016) argue that labor is a primary factor influencing agricultural growth. Increasing the labour force employed in agriculture can significantly enhance output, particularly when applied to a fixed land area, leading to improved labor productivity. Agricultural output is frequently measured

through total factor productivity (TFP). Human Capital significantly impacts TFP growth in Pakistan's agriculture sector. Literature suggests that human capital has the highest impact on agriculture in Pakistan, with an elasticity coefficient of 0.54, (Sabir & Ahmed 2008). According to Kemal et.al (2002), technical change and efficiency play a crucial role in radically enhancing labour productivity. Their study revealed that compared to neighbouring countries (India, Bangladesh, Sri Lanka, Malaysia and Korea), Pakistan's lower investment in technological development hindered labour productivity and consequently, agricultural growth. Similar results were found by Hamid and Ahmad (2009) who used data from 1972-1973 to 2006-2007 for Pakistan. Employing the Cobb-Douglas production function, their research explored the variations in agricultural value added. The study concluded that labor employed in agriculture, along with capital stock, has a positive and significant impact on value added in agriculture.

The availability of agricultural land is a prerequisite for agricultural production. The area under cultivation, along with the amount fertilizer used, positively impacts agricultural output. Awan and Mustafa (2013) found a positive and significant relationship between agricultural output and cropped area. However, Ahmad and Heng (2012) suggest that cropped area alone is not a significant determinant of agricultural productivity; rather, the combination of cropped area and fertilizer usage contributes to increased productivity in Pakistan. Hamid and Ahmad (2009) further emphasize the importance of intermediary inputs, technology, and human resources in agricultural value addition. Intermediate inputs such as fertilizers, high yielding seeds, and pesticides play a crucial role in improving agricultural productivity (Chandio et al., 2016; Ahmed et al., 2015; Awan & Mustafa, 2013; Waqar et al., 2008; Iqbal et al., 2003; Sohail et al., 1991 & Zuberi, 1990). Further research by Sabir and Ahmed (2003) in Pakistan found that fertilizer subsidies, when implemented effectively to ensure better quality and availability of fertilizers, have a negligible negative impact on total factor productivity. In other words, such subsidies can be beneficial. Additionally, Ali and Iqbal (2005) point out that the use of modern machinery, coupled with pesticides, fertilizers and high-yielding seed varieties, contribute significantly to the value-added growth in Pakistan's agriculture and overall GDP growth. However, this advancement in agricultural technology may come at a cost. Abbas et al. (2005) highlight a potential decline in labor absorptive capacity, particularly for those with basic education or lacking formal education. The implication is that while modern inputs can boost agricultural output and economic growth, policymakers need to consider potential consequences for employment, particularly among less-educated segments of the rural population.

Water availability is another critical factor of production in agriculture. Historically a water-surplus country, Pakistan now faces severe water scarcity. Khan et al. (2013) identify water scarcity as a major threat to agriculture productivity. The

Indus River, supplying 90% of Pakistan's agricultural agriculture, is becoming increasingly unreliable due to a growing population projected to reach 250 million by 2025. Kahlown and Majeed (2003) confirm that Pakistan's water resources are under immense pressure.

However, there are glimmers of hope. The Asian Development Bank (2023) recently approved a \$180 million loan to improve Pakistan's water and waste management system, aiming to increase water availability in the coming years. Rehman et.al (2019) found has negative and significant impact of water availability on agricultural GDP, highlighting the importance of water resource management for sustained agricultural growth.

Awan and Mustafa (2013) found a positive and significant relationship between water availability and agricultural output, indicating that increased water availability can positively impact agricultural productivity. This finding aligns with numerous other studies that highlight the importance of water for agriculture. Chandio et al. (2016), Ahmed et al. (2015), Waqar et al. (2008), Iqbal et al. (2003), Sohail et al. (1991) and Zuberi (1990) have all shown that water has a significant and positive impact on agricultural output.

Access to credit and information is crucial for agricultural growth. Hayat et al. (2019) highlight the dual role of credit, both financial and informational, in enhancing agricultural productivity. Financial credit enables farmers to purchase essential inputs like fertilizers and machinery, while informational credit empowers them with knowledge about advanced farming techniques. Given the significant role of agriculture in providing livelihoods, employment and poverty reduction (Abbas et al., 2005) access to credit is crucial. The study demonstrates the positive impact of micro credit on income generation and poverty reduction. The impact of credit can vary based on farm size. Anriquez and Valdes (2006) found that both formal and informal credit are positively correlated with land ownership. However, for small farmers, the impact of credit on agricultural productivity was negative and statistically significant; potentially due to over-borrowing. Parikh and Shah (1994), emphasize the importance of credit per hectare, highlighting its significant and positive impact on agricultural output efficiency. The study reveals that young farmers with access to micro credit, larger assets, proximity to markets, and better education and technology perform more efficiently. Rehman et.al (2019) stress the combined impact of credit disbursement, fertilizer usage, and improved seed on agriculture growth rates. This underscores the importance of a multi-pronged approach to agricultural development.

In the past few years, rising food prices have pushed a significant number of people below the poverty line. As agriculture plays a crucial role in poverty alleviation, commodity prices significantly influence the sector. Ahmad and Heng (2012) argue that lower prices and higher agriculture output are essential for

economic growth. However, Awan & Mustafa (2013) highlight that increased prices can mitigate the impact of increased agricultural output. The affordability of improved seeds can boost crop production, which can then be sold at higher prices. Therefore, a combination of lower input prices and higher selling prices can contribute to increased agricultural productivity.

Methodology

The paper aims to examine and explain the basic factors that influence agricultural output using the Cobb-Douglas production function. The factors considered include land, labour and capital. Land is represented by the cropped area in millions, and capital by agricultural credit and fertilizer usage. Labour is labour force employed in agriculture sector in millions. Agricultural credit is measured in million rupees, while fertilizer usage is measured in thousand nutrient tonnes and then converted to million rupees. The price variable represents the procurement price of wheat in rupees per 40 kg. Secondary data from the Pakistan Economic Survey 2023-24 was used for the period 1990-2020. The availability and recording of data in the Economic Survey constrained the study's timeframe.

Cobb-Douglas production function

$$Y = F(A, K, L)$$

$$Y = F(K, L, H_2O)$$

$$Y = F(\text{Credit}, \text{Fertilizer}, \text{Labour}, H_2O)$$

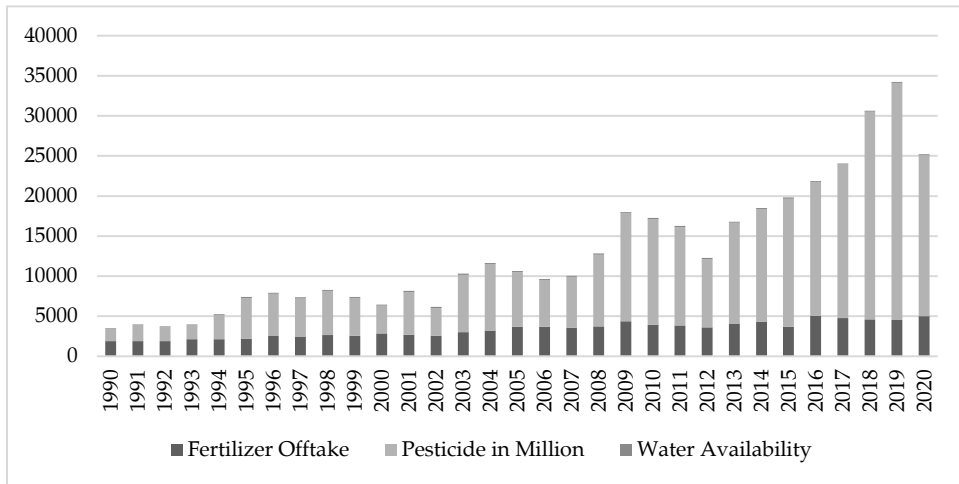
Econometric Model:

$$\text{AgricultureOutput} = \beta_0 + \beta_1 \text{AgricultureCredit}_t + \beta_2 \text{CroppedArea}_t + \beta_3 \text{FertilizerOfftake}_t + \beta_4 \text{Labour}_t + \beta_5 \text{Pesticide}_t + \beta_6 \text{Water Availability}_t + \beta_7 \text{Price}_t + \varepsilon_t$$

Graphical Representation

Figure 2 illustrates the intermediate input contributions of fertilizer, pesticide and water. It is evident that pesticide usage has been consistently increasing, followed by fertilizer usage in Pakistan. In contrast, water usage has not shown a significant increase, aligning with the literature that suggests water availability is a constraint.

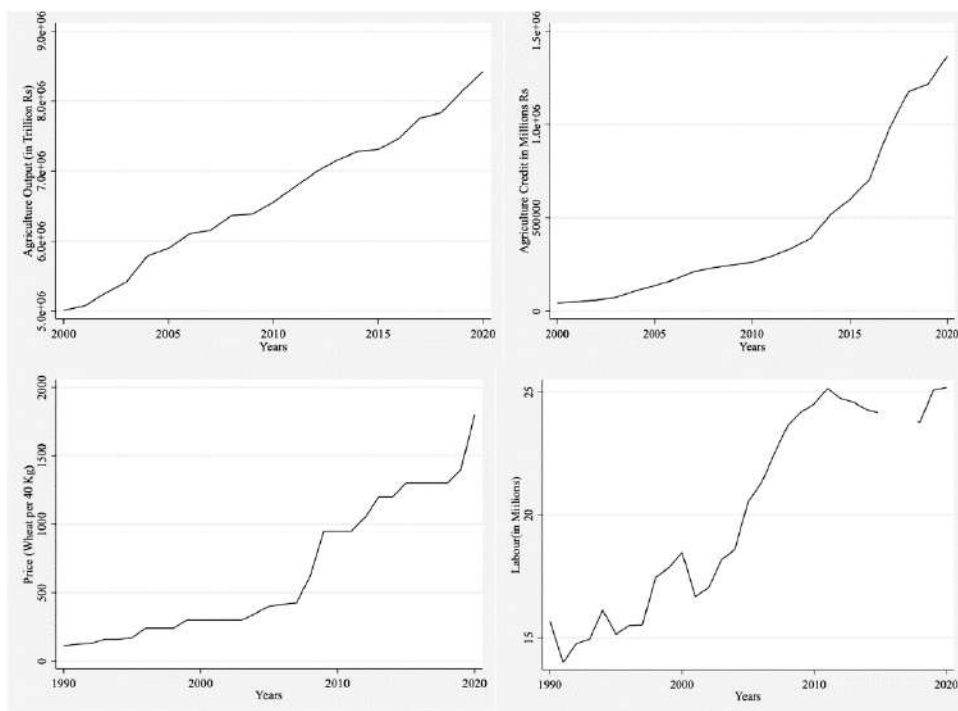
Figure 2: Intermediate Contribution



Source: (Pakistan Economic Survey 2022-23).

Figure 3 illustrates the time trends of various variables. The data shows an increasing trend in agricultural output over the years. Similarly, agricultural credit has also increased, indicating a rise in credit disbursement to farmers, which can improve their financial position. The price of wheat has also been gradually increasing. Regarding labor force participation, the trend shows an upward trajectory. This could be attributed to either a growing population or the agriculture sector's capacity to absorb a larger labor force, especially in rural areas where agriculture often provides the primary employment opportunity.

Figure 3: Time Trends



Source: (Pakistan Economic Survey 2022-23).

Results

This section discusses the econometric results. Table 1 presents the results of a simple time series OLS regression. The first regression shows that agriculture credit, fertilizer offtake, labor, and water availability have a significant and positive impact on Pakistan agricultural output. As the literature suggests, the combination of input factors and is crucial for productivity, and the results indicate that cropped area has a significant but negative impact on growth. Additionally, price negatively affects output. In regressions 2 and 3, the paper removes cropped area, price and pesticides from the analysis. The results consistently show that agricultural credit, fertilizer offtake, labor and water availability remain significant and positively associated with agricultural output. The R-squared values of all models are above 0.9, indicating a high degree of model fit.

Table 1: Dependent Variable - Agriculture Output in Millions

VARIABLES	OLS1	OLS2	OLS3	OLS4
AgricultureCredit	0.917** (0.327)	0.857*** (0.249)	0.564** (0.259)	0.309** (0.242)
CroppedArea	-215,275** (91,854)	-214,362** (88,657)		
FertilizerOfftake	621.6** (218.8)	604.7*** (205.1)	429.8** (175.8)	455.5** (180.3)
Labour	85,319** (33,746)	85,136** (32,795)	68,388* (36,588)	57,476* (31,869)
Pesticide	-5.180 (12.13)			
WaterAvailability	37,287** (13,370)	37,763*** (13,106)	37,772** (14,034)	35,656** (14,648)
Price	-925.9*** (305.6)	-921.8*** (283.7)	-473.0* (233.5)	
Constant	-2.010e+06 (1.900e+06)	-2.068e+06 (1.824e+06)	-6.238e+06*** (1.543e+06)	-5.608e+06*** (1.556e+06)
Observations	28	28	28	28
R-squared	0.933	0.933	0.916	0.910

Robust standard errors in parentheses

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 2 the presents the growth rates of various variables over the period. Agriculture has shown a remarkable growth rate of 9.91% for over three decades, indicating consistent and stable growth in the sector. This is a positive sign for Pakistan, an agro-based economy, as it suggests future prosperity. This consistent growth in agriculture can be associated with credit disbursement by the government, which has grown at a rate of 17.5%. In contrast, water availability has shown a very slow growth rate of only 0.3%, potentially limiting agricultural growth. The price of wheat has been growing at a rate of 10.5%, which is higher than the growth rate of agriculture. This could contribute to the negative impact of price on agricultural output, as discussed earlier. Interestingly, labor participation in agriculture has shown negative growth, suggesting that over the past three decades, labor may have found alternative employment opportunities outside the agricultural sector.

Table 2: Descriptives - Growth

Variable	Obs	Mean	Std. Dev.	Min	Max
AgriGrowth	30	9.91	19.54	-.721	106.18
ACRGrowth	30	17.563	17.026	-13.034	68.967
CAGrowth	30	.377	2.399	-4.818	5.009
RainfallGrowth	30	5.303	34.595	-33.425	89.947
FertGrowth	30	3.778	10.371	-14.289	36.245
PetrolGrowth	30	-6.725	23.089	-61.022	46.855
ElectGrowth	30	2.371	8.347	-19.217	13.871
LabourGrowth	27	-1.725	20.304	-100	12.5
PestGrowth	30	13.726	34.371	-35.328	107.99
WAGrowth	30	.333	1.833	-4.703	2.654
PriceGrowth	30	10.535	14.636	0	52

Source: Authors calculations

Table 3 presents the elasticities from the OLS model. Across all four regressions agriculture credit shows a positive and significant elasticity. A 1% increase in agriculture credit leads to a 0.3% increase in the agricultural output. Similarly, water availability exhibits a significant and positive elasticity. A 1% increase in water availability leads to more than an 8% increase in the agricultural output, a consistent finding across all calculations. In contrast, the remaining variables, including cropped area, fertilizer, labour, pesticides and price, were found to be insignificant for Pakistan.

Table 3: Dependent Variable: Natural Log of Agriculture Output

VARIABLES	OLS1	OLS2	OLS3	OLS4
LnAgricultureCredit	0.395** (0.176)	0.387** (0.176)	0.392** (0.176)	0.320* (0.172)
LnCroppedArea	-1.592 (2.216)	-1.651 (2.081)		
LnFertilizerOfftake	1.452 (0.852)	1.326 (0.788)	1.009 (0.733)	0.907 (0.716)
LnLabour	-0.759 (1.089)	-0.588 (0.829)	-0.570 (0.811)	-0.790 (0.731)
LnPesticide	-0.0746 (0.223)			
LnWaterAvailability	8.292*** (1.648)	8.305*** (1.647)	8.582*** (1.755)	8.469*** (1.736)
LnPrice	-0.220 (0.284)	-0.268 (0.192)	-0.222 (0.201)	
Constant	-33.63*** (6.495)	-33.29*** (5.830)	-37.64*** (5.392)	-36.12*** (5.430)

VARIABLES	OLS1	OLS2	OLS3	OLS4
Observations	28	28	28	28
R-squared	0.928	0.927	0.925	0.923
<i>Robust</i>	<i>standard</i>	<i>errors</i>	<i>in</i>	<i>parentheses</i>
*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$				

to further strengthen the research findings, the paper conducts a per-hectare analysis, with results presented in Table 4. This analysis reveals a significant and positive impact of credit per hectare on output per hectare. Similarly, fertilizer and water per hectare also exhibit a significant and positive relationship with output per hectare. Additionally, labor per hectare is found to positively influence per-hectare productivity. These findings from the per-hectare analysis corroborate the results obtained from the simple OLS regression.

Table 4: Dependent Variable: Agriculture Output Per Hectare

VARIABLES	OLS1	OLS2	OLS3
ACRperHectare	0.852** (0.343)	0.755*** (0.261)	0.611** (0.273)
FertperHectare	778.1*** (181.7)	756.1*** (168.2)	752.1*** (151.7)
LabourperHectare	72,043** (34,253)	71,767** (33,689)	66,041* (32,456)
PestperHectare	-7.870 (14.01)		
WaterperHectare	27,208** (12,816)	27,533** (12,670)	25,966** (13,182)
Price	-40.71*** (13.53)	-40.49*** (12.63)	
Constant	-253,215*** (66,413)	-253,797*** (65,397)	-193,325** (71,566)
Observations	28	28	28
R-squared	0.923	0.923	0.906

Robust standard errors in parentheses

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Discussion and Conclusion:

The findings of the paper align with existing literature on the factors influencing agricultural output. Agricultural credit, fertilizer usage, and water availability emerge as key drivers of agricultural growth in Pakistan. The positive impact of agricultural credit on output is consistent with Parikh and Shah (1994) and Hayat et al. (2019), who emphasize the crucial role of financial resources in boosting agricultural productivity. The positive correlation between fertilizer usage and agricultural output is further supported by studies like Chandio et al. (2016), Ahmed

et al. (2015), Awan & Mustafa (2013), Waqar et al. (2008), Iqbal et al. (2003), Sohail et al. (1991), and Zuberi (1990).

This paper further supports existing literature regarding the positive and significant impact of labour and water on agriculture. Labor is considered a primary factor influencing agricultural output, especially in developing countries (Kakar, Kiani & Baig, 2016). Similarly, Hamid and Ahmad (2009) found that labor and capital stock positively impact agricultural value-added. Awan and Mustafa (2013) also observed a positive and significant relationship between water availability and agricultural output.

The study demonstrates that agricultural credit, labor, water availability, and fertilizer significant contributors to agricultural growth in Pakistan. These variables effectively explain the observed upward trend in agricultural output.

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12

Poverty Alleviation through Benazir Income Support Programme: An Overview

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Abstract

Reducing poverty is one of the sustainable development goals of the United Nations (UN). Concerns regarding poverty in Pakistan have intensified following a surge in inflation during the fiscal year 2023-2024, following erratic inflation trends after Covid-19 and the 2022 floods. In this context, the Benazir Income Support Programme (BISP), a large social safety net, has played a significant role in cushioning the economy against poverty. This study analyzes the impact of BISP's unconditional cash transfer program on poverty alleviation. Literature indicates that these transfers positively affect health, social well-being, women empowerment, household wealth and political participation. However, these benefits often diminish time due to several factors discussed herein. A comparison with India's social safety programs informs recommendations for improvement. This study suggests that BISP could increase its impact by raising stipends and expanding coverage, alongside re-evaluating beneficiary eligibility. Encouraging beneficiaries' participation in formal financial platforms could stimulate savings and broader financial activity. Investments in human capital, particularly through enhanced youth employment programs, could accelerate long-term poverty eradication while BISP is active.

Introduction

Globally, unequal development exacerbates disparities between rich and poor, deepening social conflict, and inequality. The UN established poverty reduction as a key sustainable development objective in 2015. Although historical data indicates

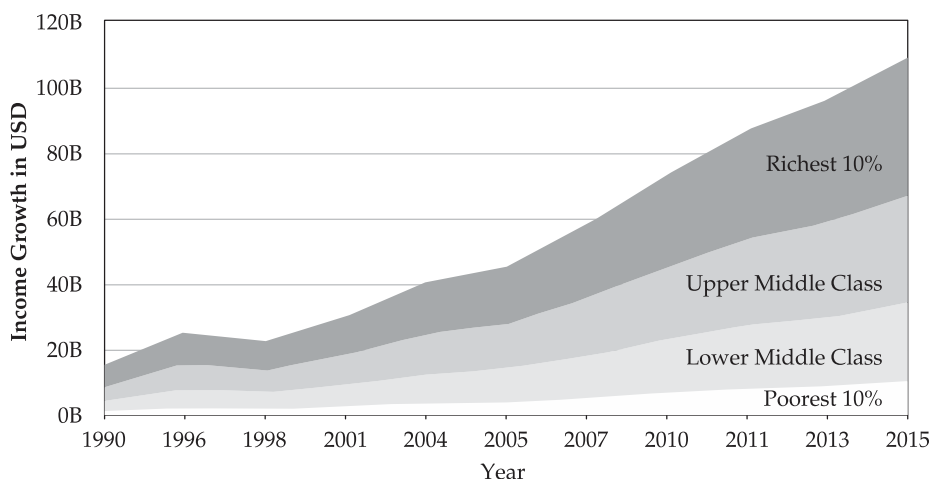
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a decrease in Pakistan's poverty rate from 61.6% in 1998–1999 to 21.5% in 2018–19 (PIDE, 2021), 40% of the population remains impoverished (World Bank, 2024). Concerns have heightened due to spikes in food and transportation costs, driving consumer price inflation to a record 35.37 percent in March 2023 (Pakistan Bureau of Statistics, 2023), followed by sustained price increases rendering necessities unaffordable (Monthly Economic Update and Outlook, March 2024).

In Pakistan the rate poverty reduction has not been consistent. Figure 1 illustrates that over the past 20 years, there has been minimal change in the income levels of the poorest groups. According to the World Bank, nearly 47 million people were lifted out of poverty between 2001 and 2018. Unfortunately, two million people fell into poverty as a result of the Covid-19 pandemic (World Bank 2021a), and an additional 8.4 to 9.1 million were affected by the 2022 floods (World Bank 2022b). Recently, data presented by World Bank representatives at the conference titled "Time for a Brighter Future: Time to Decide" indicated that the poverty rate increased from 34.2 percent in 2022 to 39.4 percent in 2023, resulting in an additional 12.5 million people living in poverty (Ibrahim, 2023).

Figure 1: Income Distribution in Pakistan, sourced from: "Evaluation: Benazir Income Support Program (BISP)" by Khan (2021).



The increase in poverty rates in Pakistan can be attributed to inflation, lackluster economic output, and a limited export base, preventing the economy from capitalizing on its abundant resources. Additionally, with 1.4 million more people entering the labor market annually, the total labor force reached 74.41 million in 2022–2023. Of these, 67.23 million were employed, resulting in a total employed population of 7.18 million and an unemployment rate of 9.6%. This figure is only a

preliminary estimate, as job mobility is low across the country, particularly in smaller cities and rural areas.

While economic growth is often seen as a determinant of poverty reduction, Pakistan's economic activity during the first half of the fiscal year 2024—primarily driven by robust agricultural output—has not been sufficient to lower poverty levels. Although this growth aids the recovery of other industries, rising debt and depleting foreign exchange reserves contribute significantly to persistent macroeconomic risks and inadequate poverty alleviation.

The current state of human development indicators in Pakistan

With a Human Development Index (HDI) score of 0.540, Pakistan ranks 164th out of 193 countries, placing it in the "low" human development category according to the 2023-2024 Human Development Report titled "Breaking the Gridlock: Reimagining Cooperation in a Polarized World," released in March 2024 by the United Nations Development Programme (UNDP).

Improvements in the Human Capital Index (HCI) in Pakistan have been achieved by investments in wealthier households, rather than targeting the poorest segments of the population (Agha & Williams, 2016). According to the World Bank (2020a), a child born in Pakistan is expected to achieve only 59% of their potential productivity as an adult due to limited access to quality education and healthcare. This disparity highlights significant gaps in human capital development, particularly among marginalized groups.

Pakistan ranks 135th out of 166 countries on the Gender Inequality Index (GII), maintaining the same position as the previous year (UNDP, 2024). Societal and cultural norms continue to restrict women's participation in the labor force, limit their educational attainment and literacy, and reduce access to healthcare, making female-headed households particularly vulnerable. According to the Global Nutrition Report (2024), Pakistan is "on course" to meet its two targets for maternal, infant, and young child nutrition (MIYCN). However, progress in improving the health of women of childbearing age remains limited, with 41.3% of women aged 15 to 49 suffering from anemia. Additionally, there is insufficient data to evaluate Pakistan's progress toward achieving the low birth weight target. Encouragingly, 47.8% of infants aged 0 to 5 months are exclusively breastfed, indicating that Pakistan is on track to meet its breastfeeding goal. While significant strides have been made in reducing stunting, 37.6% of children under five remain stunted—well above the Asia-Pacific region's average of 21.8% (Global Nutrition Report, 2024).

The role social safety nets and the beginning of BISP

Historically, Pakistan's social protection initiatives have primarily focused on formal sector social security. Notable programs include the Employees' Social Security Scheme (1970), the Workers' Welfare Funds (1971), the Government Servants' Pensions-cum-Gratuity Scheme (1954), the Public Sector Benevolent Fund and Group Insurance Scheme (1969), and the Employees' Old Age Benefits Institution (1976). However, these programs are exclusively available to workers in the formal sector, despite the fact that the majority of employment in Pakistan lies within the informal sector, which predominantly comprises individuals in the lowest income quintiles. Consequently, a large portion of the workforce—vulnerable and impoverished individuals—remains excluded from such protections. This limited coverage significantly undermines the outreach and effectiveness of these social safety net initiatives.

The two primary social safety programs currently operating in Pakistan are Pakistan Bait-U-Mal (PBM), established in 1991, and Zakat & Ushr, founded in 1980. Guided by the Ministry of Religious Affairs, local Zakat committees identify the most vulnerable and marginalized Muslims through informal channels including discussions with local authorities. The PBM oversees the primary government-run cash distribution program, formerly known as the Food Support Program (FSP). It provides a fixed amount of financial assistance and operates under the Ministry of Social Welfare and Special Education.

However, the financial crisis (2008) exposed significant shortcomings in both PBM and Zakat & Ushr, highlighting issues such as poor coverage, lack of accountability, and insufficient transparency within their bureaucratic and administrative processes. Both programs relied on manual cash delivery methods, which proved inefficient and time-consuming. Additionally, most benefits were one-time payments, resulting in recipients not receiving ongoing, reliable assistance.

The Benazir Income Support Programme (BISP) was introduced in 2008 as a response to the declining purchasing power of low-income households, providing an unconditional cash transfer (UCT) of PKR 1,000 per month. This initiative demonstrated the government's commitment to establishing a safety net program grounded in international best practices and leveraging technology to enhance accountability, efficiency, and transparency. Although BISP reached 1.74 million individuals in its inaugural year, it fell short of its initial target of assisting 3 million of Pakistan's poorest families. In 2010, BISP was formalized as an organization through the BISP Act, with a mandate to "reduce poverty and promote equitable redistribution of wealth; formulate and implement comprehensive policies and targeted programs for the uplift of underprivileged and vulnerable people." Over time, the funding and scope of BISP Kafaalat have expanded, reflecting a policy shift from short-term solutions to long-term safety nets (Guven et al., 2024).

The Benazir Income Support Programme (BISP) operates through six regional offices located in the provincial capitals of Azad Jammu Kashmir and Gilgit Baltistan, alongside 385 Tehsil offices, which function similarly to local parish councils, and 33 divisional offices across the country. Its headquarters are situated in Islamabad, the federal capital of Pakistan. The program is overseen by a board that includes non-government members, a secretary, and cabinet members from the ministries of finance, economics, and foreign affairs, in addition to a nominated chairman and executive committee members (BISP, 2023).

Small, regular, and consistent financial transfers to impoverished households help them escape poverty in the long run by promoting investment in human capital, such as health and education, while also alleviating immediate hardship (Loeser et al. 2021). Over time, the government significantly expanded the funding and scope of BISP; increasing its reach from 1.74 million households in 2008 to 9.3 million households in 2023 (BISP annual report FY 2022-2023). Currently, BISP beneficiaries are distributed across all provinces and regions of Pakistan. However, notable regional disparities in coverage indicate potential exclusion errors.

Reliable data for identifying vulnerable and deserving individuals was lacking when the BISP launched the UCT program in 2008 (Durrani, 2014). In the absence of such data, lawmakers were responsible for identifying eligible individuals, a process referred to as Phase 1 targeting. Parliamentarians received an equal number of application forms for this purpose, regardless of party affiliation. NADRA subsequently verified these forms. To enhance the program's efficacy and transparency, BISP adopted the World Bank's poverty scorecard (PSC), which identifies the most impoverished households using Proxy Means Testing. A 2009 poverty census was conducted in association with the World Bank, collecting comprehensive socioeconomic and demographic data from 27 million households. To evaluate eligibility for cash assistance, BISP analyzes survey data to generate welfare scores based on 23 verifiable variables in the PMT algorithm. The welfare score ranges from 0 (the poorest) to 100 (the richest).

Cash Disbursement Mechanism of BISP

The BISP has diligently developed a payment disbursement system that ensures access to cash for economically disadvantaged women while promoting transparency. Initially, payments were distributed via Pakistan Post from 2008 to 2012. Although Pakistan Post delivered stipends directly to recipients, this method had several drawbacks, including a manual system, deductions by postmen, the financial illiteracy of beneficiaries, and limited control over the cash after disbursement due to potential transfers to male household members. Consequently, administrative challenges restricted beneficiary outreach when financial grants were provided through this traditional approach. Nevertheless, the extensive nationwide branch network of Pakistan Post played a significant role in BISP's initial cash

payments, particularly in areas where over 700 union councils—or roughly 6,700 in total—lacked access to banks or bank branches.

In 2010, BISP underwent a significant transformation with the adoption of digital social cash payments. This shift was made possible by the 2008 Branchless Banking Regulations of the State Bank of Pakistan, which established a framework for banks to collaborate directly with BISP or through mobile carriers to distribute grants via mobile banking. This innovation allowed BISP to extend its reach to unbanked individuals in rural areas. Consequently, BISP partnered with several financial institutions, including United Bank, Summit Bank, and Alfalah Bank, as well as mobile operators, including Telenor/Easypaisa and Ufone, to facilitate digital payments for beneficiaries. Female recipients collected these payments from various payment locations such as banks, retail shops, ATMs, or point-of-sale (POS) systems. Initially piloted in five regions, mobile phone banking began transitioning to debit (ATM) cards in 2014. The Pakistan Telecommunication Authority (PTA) played a crucial role in regulating mobile transactions in areas where mobile banking was implemented as a digital platform for distributing electronic funds (BISP, 2019).

Payment disbursement transitioned to debit cards until 2016, allowing women the flexibility to collect cash at designated touch points. However, this system was not without challenges, as approximately 90% of recipients were illiterate and required assistance from others to navigate the use of their debit cards. Additionally, high card replacement rates—exceeding 20%—were observed, likely due to issues such as password loss or theft and loss of the cards themselves.

In 2016, the BISP launched the biometric verification system (BVS), a card-less payment method, designed to streamline the disbursement process. Under this system, payments are made directly to beneficiaries at designated ATMs and points of sale (POS) after live biometric verification against the national database. Between 2016 and 2019, all beneficiaries were gradually transitioned to the BVS system. To utilize digital currency, BISP required women to obtain their computerized national identity cards and register their biometric data with NADRA, leading to the removal of fraudulent beneficiaries from the program. Even women who traditionally adhered to purdah left their homes to have their biometric data captured and photographs taken in order to access digital social cash. This technology was implemented with the organization's goal of promoting social inclusion and empowering women. Additionally, possessing biometric identity cards enabled women to participate in national elections.

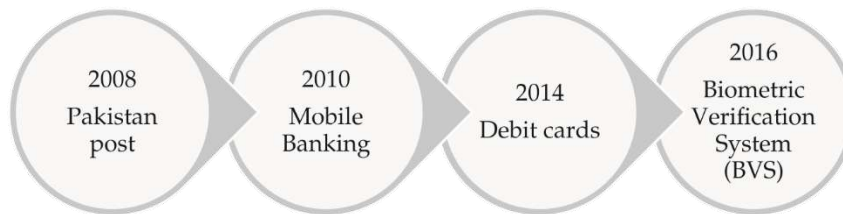
It was found that beneficiaries were provided with limited purpose accounts by banks and cell operators (in the mobile banking space), restricting their ability to withdraw only BISP payments. This indicated that the type of accounts offered had limited functionality, preventing access to other banking services such as credit,

fund transfers, savings deposits, and payment processing. Although these low-value mobile accounts constrained banks' income sources, they still generated "float balance" from the substantial volume of payments processed by BISP. Additionally, banks received monthly commission fees and achieved economies of scale due to the high transaction volumes associated with BISP disbursements. Consequently, this created a compelling business incentive for financial institutions to engage with the program.

BISP has implemented various payment distribution methods, which currently include the following categories:

- i. Money Orders
- ii. Smart Card System
- iii. Mobile Banking System
- iv. Debit Card System
- v. Biometric Verification System

Figure 2: Evolution of BISP payment technology (source: Authors' own work)



However, the impact of biometric payment systems, a more recent initiative, on women's lives may require further time to fully materialize. The availability of both debit cards and biometric verification system provides women with options for accessing their payments, potentially leading to greater empowerment.

Beneficiaries verify their identities at payment locations under the new system by presenting fingerprints that are compared to the national ID database. This system replaces the previous method, which required debit cards and PIN entries. Since fingerprints are essential for authentication, beneficiaries must appear in person to receive payments; previously, many women would send male family members or neighbors to withdraw cash on their behalf. While many beneficiaries formerly used ATMs, most of these machines are not equipped for biometric verification and are therefore excluded from the new system. Instead, the majority of beneficiaries now collect their benefits through agents operating biometric scanners at point-of-sale (PoS) locations. The implications of the transition to BVS

encompass both the immediate effects of the biometric technology itself and changes in who collects funds and how they do so.

In 2011, the BISP also established the National Socio-Economic Registry (NSER), a comprehensive data repository that contains information about the socioeconomic status of households (HH) participating in the data collection process. For the first time, in 2010, door-to-door data was collected from 27 million families across the country. During its implementation phase, NSER served as a platform for all social protection programs—both public and private—to enhance overall targeting efficiency. This dataset has been utilized by BISP and other social assistance programs for the past decade. To improve targeting effectiveness, BISP decided to upgrade the NSER survey questionnaire and methodology in 2016, resulting in an updated registration database. This decision aimed to recertify existing beneficiaries, include new ones, and serve as a foundation for other social protection initiatives. The updated data is now shared with various national and international organizations for research and program design purposes, in accordance with data sharing protocols.

The Unconditional Cash Transfer Program (BENAZIR KAF AALAT PROGRAMME)

The flagship initiative of BISP is the Unconditional Cash Transfers (UCT) program, branded as the "Benazir Kafaalat Programme," which was inaugurated in 2008. Since its inception, the UCT program has undergone remarkable expansion, evolving into the largest cash transfer program in Pakistan's history. The program's immediate objective was to shield economically marginalized households, especially women, from the detrimental effects of inflation, food insecurity, and sluggish economic growth by providing financial assistance. Its broader, long-term aspirations include fostering women's empowerment and addressing entrenched and chronic poverty, aligning with the Sustainable Development Goals (SDGs). At present, approximately 9.3 million families benefit from BISP through the Benazir Kafaalat program (BISP Annual Report FY 2022-2023).

By 2024, eighty transgender individuals have been incorporated as beneficiaries under the BISP, receiving PKR 7,000 in Kafaalat payments for the first time. Furthermore, in 2022, the government introduced a targeted petroleum subsidy of PKR 2,000 under the same program to alleviate economic pressures on vulnerable populations. This targeted petroleum subsidy aims to protect households from escalating fuel prices in the economy. Between July and December of FY2023, PKR 16.35 billion was distributed to about 8.67 million recipients under this initiative. Additionally, the program's Board approved a policy to extend support specifically for transgender people. BISP has also allocated PKR 69 billion to assist 2.76 million families affected by the 2022 floods. Furthermore, a wheat seed subsidy was

approved to support impoverished farmers, with PKR 2.94 billion disbursed to 122,687 farmers by 31st March 2023.

The BISP Kafaalat programme also has a 'Next of Kin' policy in effect to provide ongoing financial support to the families of deceased recipients. This policy allows the legal heirs of the deceased beneficiaries to become program recipients through a structured appeals process. In the event of a beneficiary's death, their family must submit the necessary documentation to the nearest BISP Tehsil Office, including the deceased's CNIC, a CNIC cancellation certificate from NADRA, a death certificate from the union council, and the CNICs of any surviving family members. Payments are subsequently disbursed to the next-of-kin as specified by the BISP policy after processing.

In addition to its regular initiatives, BISP manages the distribution of emergency programs under shock response initiatives. These include the Harnai Earthquake Relief Program, the Emergency Cash Assistance Program for Affected Parties of Covid-19 (Phase I & II), the Special Relief Package for populations living along the LOC in Azad Jammu & Kashmir, and the Emergency Relief Package for Tirah Valley in Khyber District, KPK. Among these efforts, 2.76 million families affected by the 2022 floods received payments totaling PKR 69 billion from BISP.

Criteria of eligibility for the Benazir Kafaalat Programme:

Beneficiaries of the "Benazir Kafaalat Programme" are identified and selected through the National Socio Economic Registry (NSER) survey and the scientific Proxy Means Test (PMT). The PMT assesses the household's welfare level on a scale from 0 to 100. The BISP Board determines the PMT cut-off score for eligibility based on the available budgetary constraints. Cash support is provided to all households that fall within the approved PMT cut-off score through the Benazir Kafaalat Program. In its 52nd meeting, which took place on September 23, 2021, the BISP Board approved the current PMT cut-off score of 32. However, a higher PMT cut-off score of 37 is required for eligibility for households that include a member with disabilities.

The BISP Board recently approved a policy to include transgender individuals in the Benazir Kafaalat Program, enabling them to receive financial assistance. To be eligible, transgender individuals must obtain CNICs from NADRA, explicitly stating their gender identity. A survey conducted at Benazir Registration Centers, established in every BISP Tehsil Office, is mandatory. However, the PMT cut-off restrictions are relaxed, allowing all transgender individuals who complete the survey to apply for inclusion in the program. Following data validation and verification by NADRA, transgender individuals are officially recognized as beneficiaries and can begin receiving financial aid from BISP partner banks. Benazir Kafaalat financial assistance is disbursed to eligible beneficiaries after Biometric

Verification System (BVS) through two partner banks: HBL in Punjab, Sindh, and Baluchistan, and Bank Alfalah in KP, GB, and AJK.

Conditional Cash Transfer Programs

A number of conditional cash transfer programs are integral components of the BISP program. One such program is the Benazir Taleemi Wazaif, which aims to provide basic education to families enrolled in the BISP Kafalat program. Initially launched as a pilot in five districts in 2012, the Waseela-e-Taleem Programme has since expanded to encompass secondary and postsecondary education as of 2021. For male students in primary school, the quarterly stipend is PKR 1,500, while female students receive PKR 2,000. At the upper secondary level, the stipends are PKR 4,000 for female students and PKR 3,550 for male students. Additionally, the Benazir Undergraduate Scholarship initiated in the academic year 2019-2020, covers tuition fees and provides a stipend of PKR 40,000 per year for programs at 135 public sector universities. To date, PKR 29.254 billion has been allocated for eligible students.

All applicants from low-income families are encouraged to apply for undergraduate programs at public universities. Selection will be based on need and merit, i.e., specifically considering the student's CGPA and family income (up to PKR 45,000). In addition to tuition fees, other incidental charges such as registration fees, examination fees, and library fees are covered. Each scholarship awardee also receives a monthly living stipend of PKR 4,000. Importantly, fifty percent of the scholarships are reserved for female students, with an additional 2 % allocated for individuals with disabilities. So far, 102,003 students have been awarded scholarships across three batches under this initiative.

The Pakistani government has recognized the importance of nutrition-sensitive social safety nets in promoting healthy diets and improving access to nutrient-rich food for impoverished populations. In August 2020, the "Benazir Nashonuma" Conditional Cash Transfer (CCT) program was launched to enhance the use of nutrition and health services among beneficiaries. Its primary goals are to prevent low birth weight, reduce anemia and micronutrient deficiencies, improve weight gain in expectant mothers, and prevent stunting in children under two years old. The Benazir Nashonuma Programme (BNP) is being implemented through a partnership between the World Food Programme (WFP) and the Benazir Income Support Programme (BISP), Pakistan's largest safety net.

The goal of the conditional cash transfer program Benazir Nashonuma is to encourage participants to utilize nutrition and health services more frequently. The main objectives of this intervention are:

- a) To prevent stunting in children under two years of age

- b) To promote improved weight gain among pregnant women during their pregnancy
- c) To reduce micronutrient deficiencies and anemia
- d) To enhance awareness of nutrition, maternal health, and early child health
- e) To decrease the burden of disease through better utilization of available nutrition and health services
- f) To prevent low birth weight

According to the Benazir Nashonuma initiative, pregnant and lactating women (PLW) and their children of under-2-years of age receive additional funding of PKR 2,000 quarterly for a boy child and PKR 2,500 quarterly for girl child from BISP. In exchange, expectant mothers are required to attend routine prenatal health examinations and educational seminars, consume specialized nutritious food (SNF), and ensure their children receive regular checkups and vaccinations.

The Nashonuma Program is currently operational in 158 districts across Pakistan, supported by a network of 512 Nashonuma Centers, including mobile sites. As of 2024, BISP has provided nutrition and health services to approximately 1,025,271 women and children under this initiative. This total includes 503,918 children and 521,353 PLW who have benefited from the program. According to official sources, these recipients have received care from over 488 Nashonuma Centers nationwide.

Table 1: BISP programs

Program type	Program name	Launch Year	Target Beneficiaries	Number of beneficiaries	Total amount disbursed (PKR)
Unconditional cash transfer	Benazir Kafaalat	2008	Families	8.96 million (2022-23)	128.9 billion (July-March FY2023)
	Targeted Petroleum Subsidy	2022	Families	8.67 million (July-December FY2023)	16.35 billion (July-December FY2023)
	Flood Relief Programme	2022	Families	2.76 million	69 billion (July-December FY2023)
	Subsidy for Wheat Seed Rabi	2023	Families	122 687 (until 31 st March 2023)	2.94 billion (until 31 st March 2023)
	Transgender Policy		Transgender people	80 (to date)	7000 (to date)
	Indexation of Cash Transfer		Families		9000 (for the April-June FY2023 quarter)

Program type	Program name	Launch Year	Target Beneficiaries	Number of beneficiaries	Total amount disbursed (PKR)
Conditional cash transfer	Benazir Taleemi Wazaif (Education Programme)	Primary education – 2012 Secondary education – 2021 Higher secondary education – 2021	Males and females	11.8 million (to date)	63.3 billion
	Benazir Nashonuma (Health & Nutrition Programme)	2020	Women and Children	375 150 (July-March FY2023)	1.26 billion (July-March FY2023)
	Benazir Undergraduate Scholarship Project	FY2019-2020	Males and females (with 50% scholarships reserved for females)	92000 (until the end of FY2022)	29.254 billion (to date)

Source: Authors' own research

Table 2: Funds transfer by BISP

Funds transfer to cash grants (PKR billions)					
Year	Released	Conditional cash transfer	Unconditional cash transfer	Total (conditional + unconditional)	Number of beneficiaries (millions)
2008-09	15.32	0.04	15.81	15.85	1.76
2009-10	39.94	2.89	31.94	34.83	2.58
2010-11	34.42	5.30	29.66	34.96	3.10
2011-12	49.53	4.28	41.60	45.88	3.68
2012-13	50.10	3.17	43.30	46.47	3.75
2013-14	69.62	1.20	65.11	66.31	3.64
2014-15	91.78	0.45	88.59	89.04	5.05
2015-16	102.00	1.88	96.65	98.53	5.21
2016-17	111.50	2.27	102.10	104.37	5.46
2017-18	107.00	3.20	99.00	102.20	5.63
2018-19	116.50	4.01	104.60	108.61	5.78
2019-20	243.71	3.70	228.67	232.37	9.10
2020-21	194.29	5.57	169.40	174.97	7.06
2021-22	235.63	25.35	193.74	219.09	7.74
2022-23	312.39	23.48	241.94	265.42	9.00
Total	1773.73	86.79	1552.11	1638.90	

Source: World Bank and BISP website

Program effectiveness

BISP cash transfers have demonstrably improved women's empowerment in beneficiary households, evidenced by increased mobility, political participation, and decision-making abilities. This positive impact on women's empowerment holds true regardless of whether debit cards or biometric payment methods are used. While the financial assistance provided through BISP has encouraged male household members to involve women in decision-making processes and has facilitated women's social mobility, challenges persist, preventing women from making independent decisions. Biased behavior from men continues to impede women's ability to gain bargaining power within the household (Iqbal et al., 2022). Paradoxically, the 2017–18 Demographic Health Survey indicates that working women experienced higher rates of domestic abuse compared to women outside the labor force.

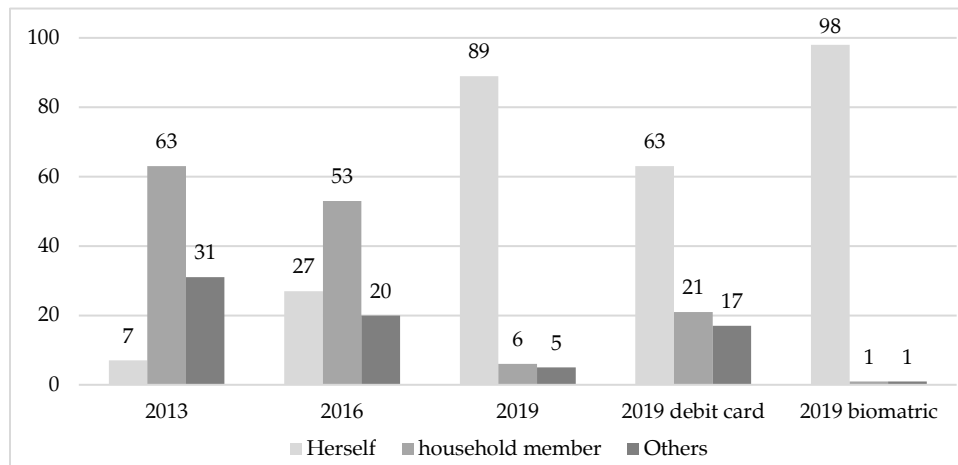
Iqbal et al., (2022) found that financial aid through BISP led to an 8% decrease in positive attitudes toward marital abuse among clients. However, this aid had a negligible impact on the frequency of emotional or physical violence. While payment methods (debit cards or biometric payments) did not significantly differ, biometric payments may lead to greater female empowerment. This could be because the impact of biometric payment, a more recent initiative, may take time to materialize, and both payment instruments allow women to retrieve their own payments. Additionally, compared to non-benefiting households, women's visits to local markets saw an overall welfare improvement of 7% during 2011–2016, increasing to 11% during 2011–2019. The effect on trips to health facilities significantly increased from 10% (2011–2016) to 12% (2011–2019).

Two possible explanations for the greater impact in 2019 compared to previous years are as follows: First, an increase in the cash stipend over time may have contributed to women's empowerment by providing them with more financial resources and opportunities to manage their finances independently. Second, the introduction of biometric payment methods in 2016 has enabled women to access cash on their own, further empowering them. Additionally, literature indicates that BISP faced minimal challenges when transitioning beneficiaries from debit cards to biometric payments in tribal areas with strong cultural norms, such as the FATA region and district Kohistan. It is noteworthy that women's status in these areas is particularly poor, limiting their access to education, employment, and mobility. However, the financial stipend has helped overcome some cultural restrictions, allowing women to collect cash independently.

According to beneficiaries, control over cash among beneficiaries improved significantly over time in 2013, rising from 63% in 2013 to 89% in 2019. Remarkably, individuals receiving cash through biometric payments in 2019 exhibited greater financial autonomy compared to those using debit cards.

According to the ID4D report by the World Bank Group in 2022, the average amount that beneficiaries took home was not significantly altered by the introduction of BVS. While some beneficiaries did receive higher cash amounts due to the transition from debit card to fingerprint authentication, this was counterbalanced by an increased reliance on human retail agents, which led to additional payments that offset any potential benefits.

Figure 3: Control over BISP cash transfer among beneficiaries (% distribution)



Source: Estimated from various rounds of the BISP's Impact Evaluation Panel Survey

Research indicates that the UCT program has significantly influenced food consumption among beneficiaries, increasing monthly food consumption per adult equivalent by PKR 69, primarily due to enhanced access to higher-quality protein (GoP, 2020a). Nayab & Farooq (2020), further highlight that BISP alone contributes an increase of PKR 81 in food consumption. The food security index for BISP cash transfer recipients improves on average as their food consumption rises (Ghulam Mustafa, 2022). Beneficiaries closer to the threshold point exhibit comparatively greater levels of food security, and the daily calorie intake is positively and significantly impacted by the BISP transfer. ideal bandwidths. Long-term effects suggest that BISP cash transfers boost calorie intake by 13% to 30% compared to non-beneficiary households. Overall, the BISP cash transfer program appears to be an effective social assistance initiative that ensures household food and dietary requirements over the long term.

The BISP has a positive effect on women's empowerment, according to UNDP and UN Women (2023). These effects include increasing women's freedom of movement within their community, their involvement in household decision-making, their ability to decide how to use the transfer, their participation in political

processes (including voting) and reducing the number of women who experience certain forms of gender-based violence, such as husbands' controlling behavior (African-Asian Rural Development Organization, 2021). BISP significantly increases voting participation across all regions of Pakistan (Guven et al., 2024). Conversely, as poverty declines, so does women's empowerment (Patoli & Lal, 2024).

Initially, until 2015, BISP beneficiary households faced significant deprivations in housing quality, particularly in sanitation, cooking fuel and flooring (O'leary et al., 2015). Recent literature indicates that these households have improved their living standards due to BISP cash transfers, enabling them to invest in clean toilets and other assets, such as computers (Nawaz & Hussain, 2024). This improvement may be linked to the UCT program's ability to increase savings; however, these savings are often accumulated informally and do not stimulate financial sector activity (Churchill et al., 2024). Consequently, despite the circulation of cash, substantial long-term improvements in national poverty reduction do not appear evident.

According to Nawaz & Hussain (2024), beneficiary households experienced greater economic welfare, indicating that BISP cash transfers are pivotal in poverty alleviation. The study also found that the ownership of livestock among recipient households increased significantly as a result of BISP cash transfers, reflecting a noteworthy improvement in this area of their economic activity. Over time, this increase in livestock assets may enhance household income and contribute to economic stability.

Children from families receiving UCTs through BISP are now eligible for elementary, intermediate, and higher secondary education under the extended Benazir Taleemi Wazaif (BTW) program. Impact studies indicate notable improvements in reducing grade repetition and increasing school enrollment, with a more significant effect on female students compared to males (Guven et al., 2024). The initiative has successfully enhanced school enrollment, attendance, and graduation, particularly benefiting female students.

BISP cash transfers have been found to negatively and significantly impact social cohesion. One explanation for this is that the monthly payment of Rs. 2,000 is insufficient for beneficiaries to participate in social events such as children's birthday celebrations and marriage ceremonies, which are important for communal harmony.

Historical data indicates a 19 percentage point decrease in poverty among BISP beneficiaries up until 2014, with Balochistan showing the most significant improvement (Impact evaluation report, 2015). The percentage of beneficiaries reporting that they had to pay a "fee" to receive their transfer dropped from 35% to 17%, likely due to a shift to the BISP Debit Card scheme in 2014 which reduced

leakage. By 2016, BISP contributed to a 7% reduction in poverty based on the Food Energy Intake (FEI) poverty line, a 3% decline in poverty gap according to the Cost of Basic Needs (CBN) poverty line, and a 10 % increase in school enrollment (Impact evaluation report, 2016). The recent impact evaluation report of 2019 highlights impressive poverty reduction with real improvements in welfare due to BISP, however the effects appear to diminish for current beneficiaries.

Cause of diminishing benefits of BISP

The BISP was designed to support the poorest 20 percent of the population but welfare gains since its inception have led to a diminishing to produce further gains for current beneficiaries. This reduction in effectiveness may be attributed to the presence of some wealthier beneficiaries who continue to receive support without significant improvements in their well-being (Nawaz & Hussain, 2024).

The BISP cash transfer's actual value has decreased by 9% since 2011 due to high inflation, despite efforts to raise the nominal value of the transfer regularly (Guyen et al., 2024). This decline in real value may contribute to the limited effect on poverty alleviation. When BISP was first introduced in 2008, the monthly payment was PKR 1,000 (or PKR 3,000 quarterly), which remained unchanged until 2018, despite economic changes and inflation. In 2018, the benefit level was increased by 66% to PKR 5,000 quarterly (PKR 1,667 per month). . However, the adequacy of this benefit—measured as a proportion of the lowest quintile households' average monthly consumption—declined from 9.8% in 2008 to 4.2 percent in 2017, with only a slight increase to 6.6% in 2018. Nayab and Farooq (2020), concluded that this increase was insufficient; for BISP UCT to effectively reduce poverty, the benefit value should account for at least 15% of these households' total consumption.

Beneficiaries in FATA and Khyber Pakhtunkhwa receive the fewest payments, and the infrequency of payments burdens them. These regional disparities in benefits create obstacles to national level poverty reduction efforts. Consequently, high poverty gaps persist in Balochistan, Gilgit Baltistan and FATA. Conversely, a positive impact on the proportion of beneficiaries who personally save money has been observed, but this effect is limited to beneficiaries in Punjab and Sindh.

The Benazir Income Support Programme (BISP) UCT program has minimal impact on both financial and multidimensional poverty due to its meager stipend. The total amount beneficiaries receive contributes only 5.3% to household expenditures (GoP, 2020a; Nayab & Farooq, 2020). Despite efforts to alleviate poverty, the program's limited financial adequacy restricts its effectiveness in significantly improving the economic well-being of households.

The 2015 impact evaluation report highlighted that 49% of girls and 64% of boys were enrolled in school, illustrating a persistent gender gap. In 2016, there was a 10%

increase in enrollment among children aged 5-12, surpassing the global average. BISP contributed to a decrease in the Multidimensional Poverty Index (MPI) measure of school attendance deprivation, which fell from 56% in 2013 to 49% in 2016. The Conditional Cash Transfer (CCT) for education has led to impressive gains, including lower grade repetition rates and higher enrollment rates, with both boys and girls benefiting. However, the impact diminishes as boys age (Uddin, 2021). One reason for this diminishing effect is that members of the beneficiary households may lack motivation to invest adequately in human capital for employment. Therefore, new programs should focus on youth skills relevant to the market. Combining these skills with interest-free loans could help impoverished families become less reliant on handouts and create sustainable livelihoods, especially since only 4-5% of the recipients' households' members are over 60.

Figure 4: Change in the real and nominal value of BISP UCT program sourced from World Bank Group report- “The evolution of Benazir Income Support Programme’s Delivery Systems”

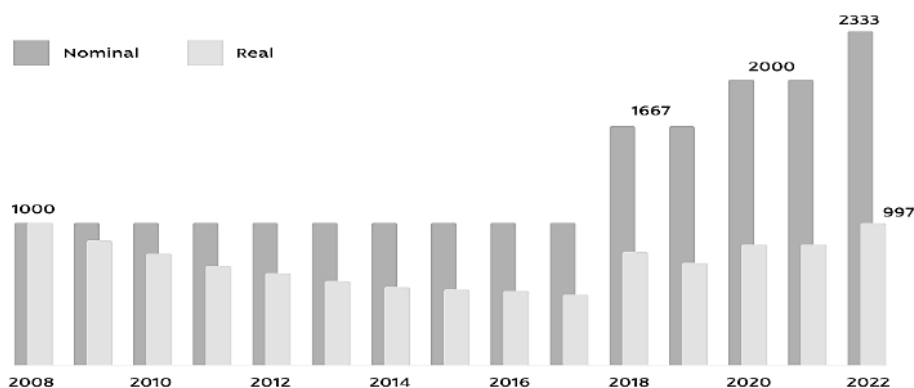
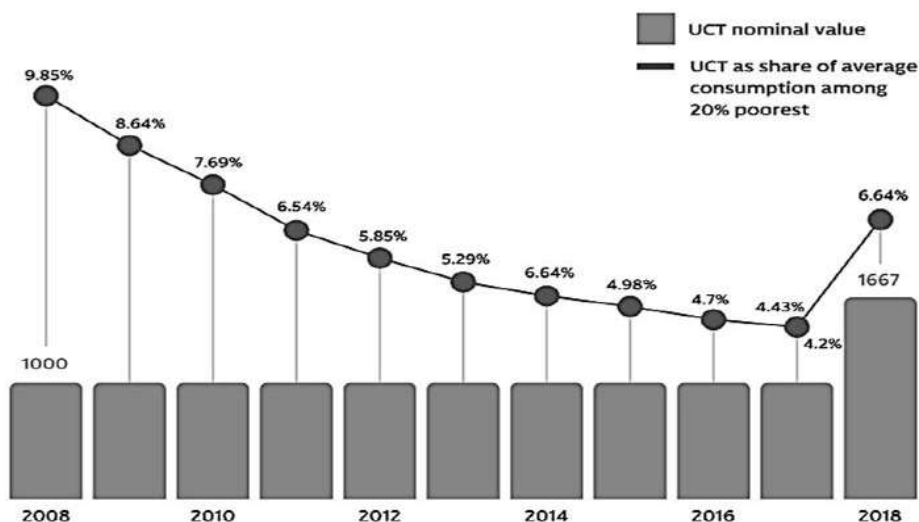


Figure 5: Change in Adequacy of BISP UCT program sourced from World Bank Group report- “The evolution of Benazir Income Support Programme’s Delivery Systems”



Source: Authors' calculations based on HIES 2011, 2014 and 2019.

Note: Adequacy is defined as the total transfer amount received by all beneficiaries in a quintile as a share of the total welfare of beneficiaries in that quintile.

The current BISP conditional cash transfers should be expanded to secondary education, as funding currently only reaches the primary level, while secondary education is more significant in determining the level of poverty a household faces during economic shocks and other unexpected circumstances (Amjad, 2017). Therefore, this program mainly helps in short-run smoothening of consumption in impoverished families instead of contributing towards long-term development of their human capital (Saeed & Hayat, 2020).

In 2024, as required by the International Monetary Fund (IMF), the government has raised the monthly payment for Benazir Income Support Programme (BISP) recipients by 20%, increasing the unconditional cash grant was increased by PKR 831. However, the scheme did not fully meet IMF requirements as Pakistan was expected to declare a rise in the monthly stipend on January 1st, that matched the inflation rate.

Way forward- Data analysis and recommendations

The 2024 IMF World Economic Outlook has forecasted values of economic growth, current account balance (as percent of GDP), investment, inflation and

unemployment for the time period 2024-2028. The forecasted values are provided in *Table 3: Forecasted values of Economic growth rate, investment, current account balance, inflation rate and unemployment rate forecasted by IMF for Pakistan*

The annual percentage change in constant prices, representing economic growth rate shows that following a decline in 2022, Pakistan's GDP (expenditure based) is anticipated to increase in the post-Covid period. It is predicted to rise gradually at a decreasing rate until stabilizing around 2027-2028 (Figure 6). Investments, defined as the total value of changes in inventories, acquisitions, and disposals of valuables less total gross fixed capital reached a low of 13.32 percent in 2023 and a maximum of 18.96 percent in 1993 (Figure 7: Investment rate estimated by IMF (1980-2028)). As of 2028, the most recent figure stands at 15.29 percent. The current account includes all transactions outside those involving capital and financial goods, categorized into income, current transfers, and goods and services. Pakistan's current account percentage ranged from a minimum of -6.82 percent in 2008 to a maximum of 3.62 percent in 2003, with an average of -1.87 percent over that time (Figure 8). The most recent figure is -1.7 percent from 2028. Pakistan's unemployment has varied from 3.07 percent in 1987 to 8.5 percent in 2023, with an average of 5.79 percent (Figure 7). The most recent figure for unemployment is 5 percent in 2028.

Table 3: Forecasted values of Economic growth rate, investment, current account balance, inflation rate and unemployment rate forecasted by IMF for Pakistan

Year	Economic Growth rate	Investment	Current Account Balance	Inflation rate	Unemployment rate
2024	2.50	14.52	-1.80	17.54	8
2025	3.60	14.46	-1.59	9.34	7.50
2026	4.50	15.14	-1.59	6.50	6.50
2027	5	15.32	-1.57	6.50	5.50
2028	5	15.29	-1.70	6.50	5

Source: IMF, unit of measurement: percent

Inflation is defined as year-on-year percentage changes in consumer prices ranging from a minimum of 1.92 percent in 2003, to 29.4 percent in 2023 as the highest (Clandinin et al., 2024). The most recent figure is projected at 6.5 percent for 2028 (O'Neill, 2024) (Figure 10).

Figure 6: Growth rate estimated by IMF (1980-2028)

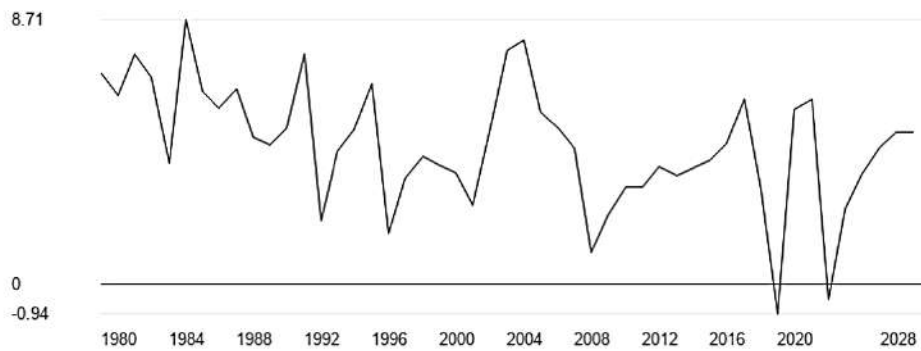


Figure 7: Investment rate estimated by IMF (1980-2028)

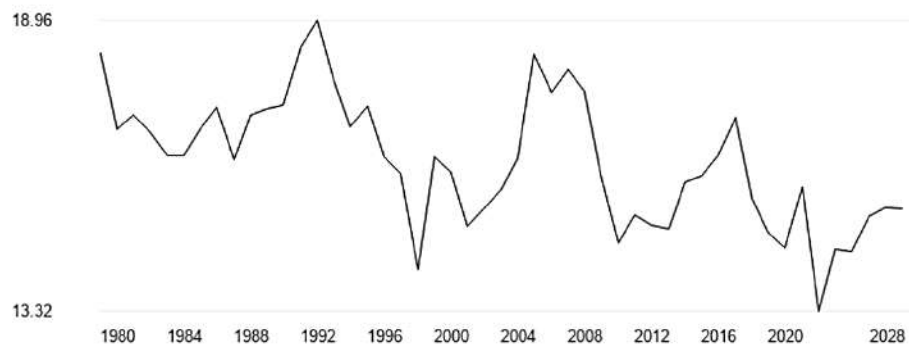


Figure 8: Current Account balance, percent of GDP, estimated by IMF (1980-2028)

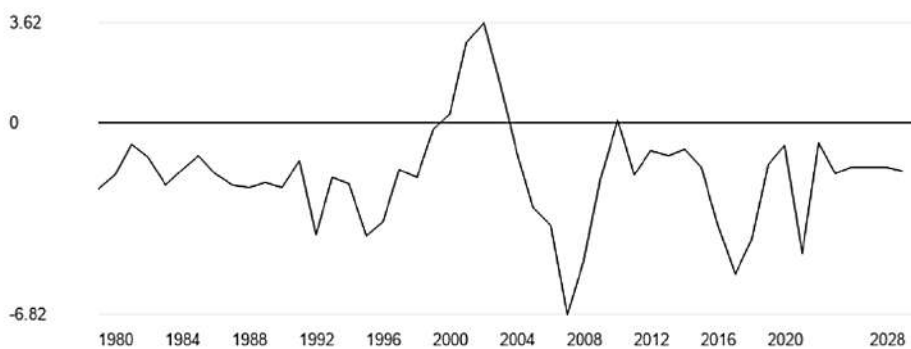


Figure 9: Unemployment rate estimated by IMF (1980-2028)

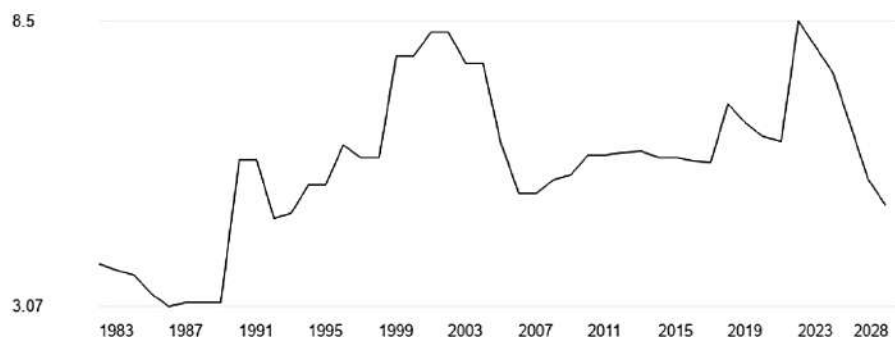
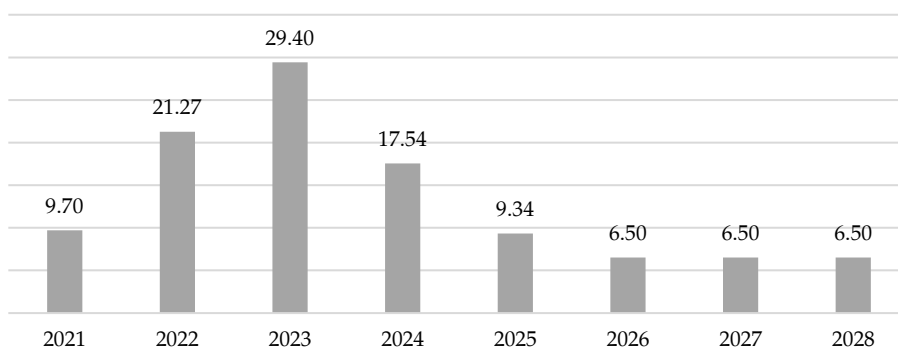


Figure 10: Inflation rate estimated by IMF (1980-2028)



Given the forecasting of all macro-economic indicators, it is expected that the interaction of these variables with the performance of BISP UCT program may impact poverty alleviation in the future. As political stability fluctuates over time, this study intends to make suitable recommendations based on the anticipated effects on poverty. To support these forecasts, the study will utilize values of cash disbursements under the BISP program (Table 4).

Table 4: Forecasted values for funds transfer to cash grants

Year	Released	Conditional cash transfer	Unconditional cash transfer
2023-24	264.63	14.53	225.36
2024-25	287.00	15.94	243.67
2025-26	312.20	17.76	263.48
2026-27	336.17	20.09	282.16
2027-28	361.03	22.52	301.08

Year	Released	Conditional cash transfer	Unconditional cash transfer
2028-29	384.43	24.96	318.44
2029-30	408.35	27.18	336.60
2030-31	433.24	29.20	356.16
2031-32	457.38	31.22	375.16
2032-33	480.02	33.06	392.69

BISP is undertaking new projects to enhance the impact of financial aid on the underprivileged, including:

- Financial Inclusion and Financial Literacy Programmes
- Hybrid Social Protection Programme
- New Payment Model

This study forecasts cash disbursement values for Conditional Cash Transfer (CCT) and Unconditional Cash Transfer (UCT) programs to depict the performance of the existing BISP program in the next few years. It suggests that BISP may increase its coverage by around 51 percent on average, with an 8 percent increase in UCT and 12 percent increase in CCT cash disbursements. The International Monetary Fund (IMF) predicts that, on average until 2028, growth will increase by 20 percent, inflation will decrease by 19 percent and unemployment to decrease by 11 percent. However, if BISP expands its coverage by 51 percent while increasing cash disbursements only by 8 percent (considering that unemployment decreases only by 11 percent), the program may not sufficiently alleviate poverty. Handouts alone will not enable the impoverished to flourish; opportunities cannot be replaced by financial transfers. Exclusion from opportunities may explain why no significant impact has been observed on poverty levels.

Therefore, BISP is recommended to enhance the effectiveness of its rather than solely focusing on expanding coverage, while also addressing regional disparities. The social safety net is administered by multiple federal and provincial administrations, leading to some deserving individuals being excluded and duplicate efforts being made. The newly established Poverty Alleviation and Social Safety (PASS) Division should consolidate these programs and create a social protection framework that clearly defines the roles and responsibilities of both federal and provincial governments to make a meaningful impact.

Conditional cash transfers have gained popularity alongside UCTs and have shown impressive results in countries such as China, Brazil, India, and Mexico. As social safety nets become more prevalent globally, it is crucial that these programs target the appropriate focus group to maximize resource efficiency and effectively reduce poverty. One of the most successful examples of cash transfer programs in India is the National Rural Employment Guarantee Act (NREGA) in India, which

has demonstrated significant impacts on poverty alleviation by providing guaranteed employment and income support to rural households.

The National Rural Employment Guarantee Act (NREGA) provides volunteer households with 100 days of waged manual labor. Applicants can withdraw their unemployment benefits if they are not hired within 15 days of applying. This program serves as a significant model for Pakistan to address urban-rural income disparities, particularly as poverty in rural areas increased at nearly twice the rate of urban areas between 2011 and 2014. Despite having more earners per household, rural household income remains lower due to harsh working conditions, long hours, low pay, and unstable employment (Mahmood, 2006).

The National Social Assistance Program (NSAP) in India provides targeted, unconditional cash transfers to widows and the elderly, focusing on efficiency and reducing leakages compared to India's Public Distribution System (PDS). NSAP has been shown to be more effective (Dutta, Howes, & Murgai, 2010). Under this program, cash transfers are available to the elderly (60 years of age and older) who fall below the federal poverty threshold. Additionally, benefits can be tiered based on age, allowing an 80-year-old to receive more assistance than a 65-year-old.

In a similar vein, widows below the federal poverty level may receive unrestricted funding up until the age at which they become eligible for the pension plan, ensuring that participants are not duplicated (Afzal et al., 2019). Additionally, disabled individuals below the poverty line may qualify for unconditional cash transfers. Given the effectiveness of CCTs in targeting health and education outcomes, these components could be beneficial. Although conditional cash transfer components were previously added to BISP, they were removed due to inadequate design and ineffective monitoring. Enhancing and re-implementing these components could promote human development and reduce poverty based on the data presented in the study (Afzal et al., 2019).

Recommendations

BISP should increase its cash transfer program's coverage and aid amounts to effectively contribute to the Sustainable Development Goals (SDGs), particularly the first goal of eradicating poverty in all its forms. Given Pakistan's commitment to the 2030 agenda for sustainable development, expanding the cash transfer program is essential to address poverty and social exclusion. Additional conditional initiatives targeting education, nutrition, and productive resources could yield better results than unconditional cash transfers alone. The government is advised to pay attention to focus on enhancing human capital development (Afzal et al., 2023).

While conditional cash stipend can enhance education nationwide, programs to decrease unemployment and generate youth employment opportunities are

essential. A consistent policy framework revolving around skill enhancement, vocational training, and technological advancement is important for poverty reducing human capital development. All this could help eradicate poverty while maintaining macroeconomic and political stability.

The limited amount provided by BISP hinders its ability to significantly reduce poverty. Increasing the transfer amount could lead to improved socioeconomic outcomes. Additionally, household eligibility must be re-evaluated to prevent unnecessary leakages and ensure that more deserving and vulnerable households are included in the coverage.

Cash Disbursement under BISP, financial inclusion and digital finance.

Access to formal financial platforms is crucial for enhancing financial sector activity through the circulation of cash. Currently, the wealth increase from BISP's UCT program does not translate into greater financial sector activity as savings are often accumulated through informal channels. Increasing awareness and access to formal financial institutions for savings could stimulate financial activity and contribute to long term poverty alleviation.

The persistent gender gap in financial access remains a significant issue. According to the IMF's (2023) Financial Access Survey while account ownership for both men and women increased slightly between 2021 and 2022, men still own 55 percent more deposit accounts than women and hold substantially higher outstanding deposit values. The disparity widens further when considering loan account ownership and outstanding loan values. Monitoring developments in financial access is crucial to addressing these disparities effectively.

Pakistan has long struggled with low levels of financial inclusion, with only 21% of adults financially integrated in 2021, compared to a global average of 69% (Qadoos, 2022). Women are disproportionately affected, as they face a significant gender gap in access to financial services. To address this, the government implemented the National Financial Inclusion Strategy (NFIS) as part of its 100-day goal, aiming to open 20 million digital transaction accounts owned by women by 2023. The NFIS seeks to enhance women's financial inclusion and reduce the existing disparities in access to formal financial services.

The "Branchless Banking Savings Account" has significant potential, but the government must recognize that many beneficiaries are too impoverished to save. The main barriers to accessing formal financial institutions are low income and a lack of digital literacy. Simply transitioning from traditional savings accounts to branchless ones and offering affordable options will not suffice to include the underprivileged, especially women. A thorough analysis of beneficiaries' financial behavior is essential to provide suitable products. Research indicates that

integrating financial literacy and digital training components into cash transfer programs significantly enhances financial inclusion and economic empowerment (Arner et al., 2020; Noreen et al., 2022).

Researchers found that for cash transfer programs to achieve complete financial inclusion, it is essential to provide financial inclusion trainings and seminars that teach women fundamental financial literacy and business skills. To ensure meaningful results, these training components should be tailored to the current mental and skill levels of the poor. The mobile phone, particularly smartphones with internet connectivity, represents a powerful technological advancement capable of revolutionizing society and progress. Research indicates that this technology has the potential to significantly advance the financial sector and contribute to achieving each of the SDGs.

Role of Fintech

Fintech applications have been successfully integrated into some Public Financial Management (PFM) activities, demonstrating their potential to expedite transactions and enhance citizen-government engagement, particularly in government-to-person (G2P) payments. The types of payments and G2P schemes are mentioned in Table 5. These applications aim to address issues in traditional payment systems, such as limited access to bank offices. Internet-based payment schemes can automate payments and facilitate large transactions outside regular business hours (Afzal et al., 2024). Overall, fintech can improve the payment system significantly, as summarized in Table 6.

Table 5: Types of fintech payment methods and suitable G2P payment schemes

Fintech Payment Type	Payment Scheme
Mobile Money	Cash Transfer Programs
Internet-based Fintech Payments	Salaries and pensions
Digital Money	E-vouchers for health services; cash transfers (G2P)

Table 6: Benefits of Fintech in Public financial payments

Benefits of Fintech in G2P payment programs	
Greater fiscal transparency	Creation of dependable, frequent data that may be made available to the public via fiscal transparency portals; improved payment data traceability and accountability
Improved Budgetary Planning and	Improved budget execution, particularly

Management	for cash transfer social programs by using fintech applications for payments distribution; better data for resource allocation during project planning
Enhanced cash handling	Enhanced daily cash management and stronger treasury single account operations based on more accurate and timely data

The integration of fintech in public finance is influenced by factors such as the creation of government financial management information systems (FMIS), digital infrastructure, and a government's digitalization strategy. To maximize benefits, governments must develop a digitization strategy tailored to their specific contexts. Digital identification represents another revolutionary advancement, crucial not only for digital finance but also for broader empowerment. Formal identification is a key component of the SDGs and is the focus of a significant World Bank-led initiative called ID4D.

Over a billion people have received digital biometric identification through India's Aadhaar system, which has had a transformative effect. Aadhaar demonstrates the potential of such systems to directly achieve the SDGs and increase financial resources available while highlighting risks related to data protection and other abuses. Effectively planned and executed digital identification programs can enable fundamental transformations in achieving SDGs and promoting financial development. Operated by the Unique Identification Authority of India (UIDAI), Aadhaar involves voluntarily assigning each resident a 12-digit random number. Since its launch, it has increasingly been used to access government services, social services, banking, and insurance. Enrollment is free, and a biometric deduplication mechanism ensures that each person receives only one number. When integrated with other components of the India Stack strategy, Aadhaar facilitates easier access to financial accounts, digitizes government payments and services, and enhances efficiency while reducing costs. However, despite its benefits, Aadhaar raises concerns about privacy and data protection.

Cryptography technologies play a crucial role in safeguarding the confidentiality, integrity, and accessibility of content transmitted over networks. They ensure that only authorized individuals can access their SSP information that is stored. Furthermore, assaults on information availability, such as denial of service, can hinder even verified biometric users from accessing their SSP records (Alsmadi et al., 2018). To mitigate these risks, technologies like firewalls can be implemented to block stop malicious network and application traffic, enhancing overall security (Caballero, 2017).

The growing reliance on Point of Sale (PoS) agents can have several consequences. In areas with low competition among retail agents, it may strengthen their exclusive authority, allowing them to demand side payments (illegal fees) in exchange for cash disbursement. Conversely, PoS agents can assist beneficiaries with withdrawals, making the process easier for those who are illiterate compared to using ATMs. To mitigate potential issues with human involvement, technologies like iris recognition technology (IRT) could be beneficial. (IRT)-based authentication systems offer a viable alternative to fingerprint scanners, such as the elderly and manual laborers. This shift toward biometric applications could enhance accessibility and security in financial transactions.

IRT uses ocular scan technology to identify and verify individual's identity at automated teller machine (ATM), teller desk, or contactless payment systems. The device scans the colored part of the eye, providing significant security benefits by preventing fraud scenarios such as impersonation. Additionally, IRT enhances customer experience by eliminating the need for bank account cards and personal identification numbers (PINs). Its contactless nature also limits the spread of infectious diseases, making it a hygienic option. Since 2016, the UN, particularly the World Food Programme, has utilized the EyePay platform from IrisGuard to provide financial aid. With iris recognition technology, beneficiaries can make cash withdrawals, and obtain food vouchers without needing a bank account or credit card. This method simplifies the ATM cash withdrawal process by reducing tedious steps like plug-in cards and entering passwords while ensuring convenience and safety for users.

Voice recognition technology was planned for South Africa's 2012 grant payment reform to replace fingerprint scans. However, despite collecting large quantities of voice samples during beneficiary re-registration, the system was never implemented.

The IMF has supported Costa Rica in implementing fintech applications to enhance financial inclusion, particularly for women, and to improve its government-to-person G2P payment system for cash social programs. In 2019, digital prototypes for centralizing cash transfer payments were developed during a "hackathon." Subsequently, digital payment methods, such e-wallets and mobile banking, were introduced to ensure payment tracking. By late 2021, Costa Rica began using the digital platform SUPRES to deliver cash transfer payments directly to beneficiaries' bank accounts. This new platform, linked to the Costa Rica Payment System (SINPE), enabled nearly 300,000 recipients to receive payments in the first quarter of 2022. The implementation of this system has improved treasury operations' efficiency, reduced travel expenses, and provided access to a variety of financial services offered by SINPE's e-wallet.

For G2P payments, treasuries should lead the implementation of fintech applications in order to maintain and expand the coverage of Treasury Single Accounts (TSAs). Modern cash management relies on the TSA, which creates a uniform framework for government bank accounts, enabling centralized control over financial resources (Pattanayak and Fainboim, 2011). Effective government banking arrangements are essential to ensure timely collection of tax and non-tax revenues and to manage cash balances efficiently, minimizing borrowing costs or maximizing returns on excess cash.

The use of machine learning algorithms to analyze atypical data from mobile phones (Blumenstock et al., 2015; Blumenstock, 2018), satellites (Jean et al., 2016; Chi et al., 2018), and other nontraditional sources (Sheehan et al., 2019; Fatehkia et al., 2020) is creating a new paradigm for evaluating living standards in low- and middle-income countries (LMICs). These estimates are appealing because they can be generated quickly for large populations at a far lower cost than conventional surveys. Policymakers are increasingly using these data sources for targeting. For example, the governments of Togo and the Democratic Republic of the Congo identified cash transfer recipients using phone-based wealth estimates (Aiken et al., 2022b; Mukerjee et al., 2023), and the government of Colombia incorporated digital financial records into an aid package.

The Novissi initiative in Togo provided underprivileged individuals with five monthly cash payments totaling about USD \$14 during the COVID-19 pandemic. Operated by the Togolese Ministry of Digital Transformation and the non-profit GiveDirectly from November 2020 to August 2021, the program supported 138,589 rural residents. Eligible men received 7,450 FCFA (USD \$13), while women received 8,620 FCFA (USD \$15.50) for six months. Registration required a working voter ID number, a SIM card, and access to a cell phone through a short USSD form and toll-free mobile shortcode.

Qualifying beneficiaries received their benefits every month, using mobile money. If a subscriber did not already have a mobile money account, one was automatically created for them. Eligibility was determined using pre-program mobile phone records to identify individuals living on less than \$1.25 per day, targeting the lowest 29% of subscribers) However, these criteria created systematic exclusions from the program.

To register for Novissi, beneficiaries needed a valid voter ID as a unique identifier and must have access to a mobile phone to complete registration via the unstructured supplementary service data (USSD) platform. Additional requirements included having completed previous mobile network transactions for poverty estimation, being aware of the program's existence, possessing basic digital literacy to navigate the USSD process, and identifying any errors from the phone-based machine-learning algorithm.

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