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The Dual Role of Exports in the Structural Transformation of the Developing Countries: A Post-Keynesian Structuralist Approach

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Abstract

The postcolonial development trajectories of Latin America, Sub-Saharan Africa, and India have defied the Lewisian structural transformation, in which surplus labor is transferred to modern industry. Rather than a seamless transfer of labor from the informal to the formal sector, these economies have been marked by persistent labor surpluses and entrenched dualism, with large informal sectors coexisting alongside smaller, globally competitive formal sectors and only limited spillovers between them. Heterodox approaches, including Post-Keynesian and Structuralist perspectives, attribute these constraints to limited autonomous demand, balance-of-payments pressures, structural bottlenecks, and elevated Kaldor-Verdoorn coefficients. When autonomous demand or the external balance is the primary constraint, sustained export growth combined with a low Kaldor-Verdoorn coefficient can increase labor demand and facilitate structural transformation. However, this logic presumes a stable composition of external demand. In reality, global demand shifts toward new technologies and sectors, rendering export growth alone insufficient without concurrent diversification and upgrading.

The Indian case exemplifies this dynamic. Since the 2000s, the growing share of high-productivity sectors in manufacturing exports has widened the productivity gap between tradable and non-tradable sectors, thereby reinforcing dualism within industry. Tradable sectors, supported by global demand, exhibit pronounced Kaldor-Verdoorn effects, whereas non-tradable sectors remain stagnant and cannot initiate productivity cycles. This segmentation underscores the limitations of export-led strategies for achieving comprehensive structural transformation.

In this paper, we develop an extended Balance-of-Payments Constrained Growth model featuring a segmented productivity function to capture these divergences. The model shows that while global demand supports productivity growth in export sectors, it also constrains conditions for positive employment growth, particularly as Kaldor-Verdoorn values approach critical thresholds. These findings highlight exports' dual role in easing external constraints while worsening internal imbalances.

JEL codes: O11, O14, O33, E12, B22

Keywords: Structural transformation, Export-driven growth, Dualism, Kaldor-Verdoorn coefficient, Jobless growth, Outsourcing, Global demand pattern, Segmented Productivity

1. Introduction

The postcolonial development trajectories of Latin America, Sub-Saharan Africa, and India have decisively defied the Lewisian virtuous trajectory of absorbing surplus labour into modern industry. Rather than a seamless transfer of labour from the informal to the formal sector, these economies have been marked by persistent labour surpluses and entrenched dualism- vast informal sectors coexisting alongside globally competitive enclaves, with only limited spillovers between them. This pattern is not transitional but structural. It reflects deep obstacles to transformation in economies where demand for output and employment remains weak, capital accumulation is uneven, and external dependence is pervasive. The outcome has been a fractured growth path, with headline GDP expansion lacking the broad-based employment absorption that Lewis anticipated.

In Latin America, despite episodes of industrialization, growth was constrained by balance-of-payments limits and weak domestic demand, leaving enclave sectors dynamic while domestic sectors stagnated (Prebisch, 1950; Furtado, 1976). The balance-of-payments (BOP) constraint is central to structuralist and Keynesian explanations of Latin American growth and development (Thirlwall, 1979). The BOP constraint arose from an asymmetry: the income elasticity of imports rose in the 1970s, while exports remained concentrated in primary commodities with low income elasticity, so they did not grow fast enough to cover imports.

The exporting sectors, such as automobiles, petrochemicals, and finance – the ‘enclave’ sectors – expanded during boom periods, either through commodity booms or expansionary policies, often financed by external borrowing. For example, the Brazilian growth phase of 1968-83 and the Mexican oil booms in the 1970s-80s created industrial expansion, but in the early 1980s, when oil prices fell, the ‘stop’ phase of the cycle triggered a debt crisis and reserve depletion, forcing austerity, collapsing domestic demand, and leading to widespread informalization of the economy. The BOP constraint thus created stop-go cycles in which growth spurts in enclaves, which led to positive productivity gains, were followed by crises, leaving the majority

of the economy trapped in low productivity (Bresser-Pereira, 2019). Thus, the BOP constraint and the stop-go cycles led to limited labor absorption and informal employment despite industrialization (Ocampo, 2004).

In Sub-Saharan Africa, growth has historically been concentrated in commodity sectors such as oil, minerals, and cash crops, which operate as isolated enclaves with weak linkages to the domestic economy. For example, copper mining in Zambia, cocoa exports in Ghana, and oil exports in Angola have remained disconnected from domestic industry. Nigeria's oil exports dominate GDP and foreign exchange earnings, yet the sector is capital-intensive and has limited labor absorption (Sala-i-Martin, Subramanian, 2003). Resource dependence has generated productivity cycles tied to global commodity markets, and productivity gains in enclaves do not spill over to the domestic economy. Labor shifts into low-productivity informal services rather than modern industry, producing enclave economies without structural transformation (Mkandawire, 2001; UNECA, 2013).

India's post-1991 trajectory illustrates a third variant: an export-induced growth regime in which globally competitive sectors (ICT, pharma, auto) thrived on external demand and provided a stimulus to investment and growth (Dasgupta, 2022; Srinivasan and Dasgupta, 2024). However, despite attaining a higher GDP growth rate post-1991 than in the 80s, India registered hardly any significant increase in its non-agricultural employment growth rate. This weak relationship between output and employment growth has largely been explained by the prevalence of a high Kaldor-Verdoorn coefficient in India (Tejani, 2018; Dasgupta and Basole, 2026). The conventional Kaldor-Verdoorn framework posits that labor productivity growth is endogenous to output growth, driven by increasing returns to scale and cumulative causation. In this framework, the main constraints on employment and structural transformation in India arose primarily from endogenous labor-saving technological progress during the liberalization period since the 1990s. A higher Kaldor-Verdoorn coefficient implies stronger productivity gains from output expansion, but it also reduces the sensitivity of employment growth to output growth, since labor-saving technological progress is endogenously reinforced.

The comparative experiences demonstrate that not only has the Lewisian expectation that surplus labor would be absorbed into modern industry failed to materialize, but dualism has also persisted as a structural feature of postcolonial development. The experiences also highlight the diverse routes through which development embeds duality. In the Latin American case, dualism has been perceived to arise from macroeconomic demand and balance-of-

payments constraints, whereas in the African case, it has been argued to be driven by structural bottlenecks on output. India's case shows that dualism can persist even when exports, aggregate demand, and the balance of payments improve. The analysis has focused on the labor productivity channel, in which labor demand in the formal sector is perceived to be constrained by a sharp increase in the labor productivity growth rate in the presence of a high KV coefficient.

The experiences of developing countries have informed post-Keynesian and structuralist theories, which treat the binding constraint on structural transformation as autonomous demand, the balance of payments, structural bottlenecks, or a high KV coefficient. A common proposition stems from this literature is that a higher output growth rate necessarily aids structural transformation when the KV coefficient is sufficiently low*, regardless of the source and pattern of demand*. By implication, for countries where the binding constraint on the output growth rate stems from autonomous demand or the balance of payments, a higher export growth rate under a low KV coefficient would be sufficient to increase labor demand and aid structural transformation.

This paper extends the debate by highlighting the role of the demand pattern in shaping structural transformation, beyond the constraints traditionally emphasized in Post-Keynesian and Structuralist approaches. We argue that

1. The responsiveness of labor demand to the output growth rate depends on the pattern of demand under what we call a *segmented productivity function,* and

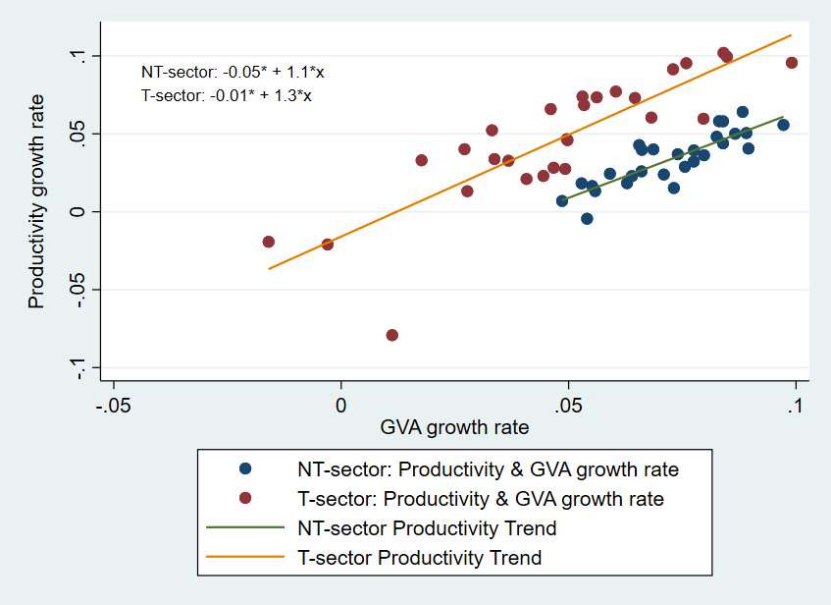
2. Higher export and output growth rates may not constitute a sufficient condition for structural transformation, even under a low KV coefficient.

We define a segmented productivity function as one in which the productivity growth rate varies across sectors because of differences in the technological sophistication of the commodity basket. The possibility of such a segmented productivity function is particularly evident in developing countries, where the commodity basket of the tradable sector can differ qualitatively from that of the non-tradable sector in terms of technological sophistication. The existence of segmented commodity baskets in developing countries can be attributed to a pattern in which export demand is skewed in favor of technologically sophisticated goods relative to domestic demand. Our argument resembles Linder (1961), which argued that the

degree of a country's product sophistication was linked to its per capita income. If the producers in the tradable sector aim to cater to export demand in developed countries, where demand is more skewed toward technologically sophisticated goods than in developing countries, then the commodity basket of the tradable sector can be qualitatively different from that of the non-tradable sector.

The notion of the segmented productivity function in this paper is motivated by stylized facts of the Indian economy. The scatter plots in Figure 1 show the relationship between productivity growth and gross value-added (GVA) growth in the tradable and non-tradable sectors. The intercept of the productivity function in the tradable sector is higher than that in the non-tradable sector.

Figure 1: Productivity Growth Rate and GVA growth Rate in the Tradable and Non-Tradable Sector



Source: KLEMS Database, Reserve Bank of India

The significant difference in the intercept terms raises the following theoretical questions: What role does the demand pattern play in structural transformation? Does higher export-induced growth necessarily lead to a higher employment growth rate under a low KV coefficient? If not, what are the conditions under which higher exports lead to higher labour demand?

The theoretical model developed here aims to answer these questions by extending the Structuralist framework to integrate segmented productivity into Verdoorn dynamics, grounded in the stylized facts of the Indian economy. By incorporating the demand pattern, this paper contributes to the Post-Keynesian and Structuralist literature by highlighting an additional dimension of the structural transformation problem - namely, the qualitative role of the demand pattern in mediating the link between growth and labor absorption.

The paper is organized as follows: Section 2 briefly outlines the Structuralist and Post Keynesian approaches to the dual economy. Section 3 reviews the Indian economy since the 1990s, the post-reform period, and highlights stylized facts. Section 4 introduces the model and presents the analysis and discussion; Section 5 concludes with limitations and suggestions for future research.

2. A brief overview of Structuralist and Post-Keynesian Approaches to Dual Economy

The study of growth and structural transformation in dual economies has long been central to development economics. Dual-economy analysis is rooted in the classical development tradition, particularly in Lewis's surplus labor model. Lewis (1954-55) viewed the economy as divided between a traditional, low-productivity sector and a modern, capitalist sector that could absorb labor at a constant real wage. Structural transformation occurs as profits in the modern sector are reinvested, leading to more employment and higher productivity. Although influential, this framework assumes that capital accumulation naturally drives transformation, a supply-side view later challenged by Structuralist and Post Keynesian scholars.

Structuralist and Post Keynesian traditions, despite their different origins, share a critique of neoclassical assumptions and emphasize the importance of demand, technological change, and persistent structural heterogeneity. Recent research has broadened this view, offering new insights into how dual economies develop and why many developing countries struggle to move from low- to high-productivity activities.

Structuralism developed from the work of the Economic Commission for Latin America and the Caribbean (ECLAC), associated with Prebisch, Furtado, and later with Thirlwall and Taylor. It redefined dualism as a persistent structural condition rather than a transitional phase. Structuralists argue that technological asymmetries, specialization patterns, and external constraints, especially the balance of payments, shape long-term growth paths. In this tradition, growth and structural transformation depend on:

- Shifting the productive structure toward higher-productivity, higher-income elasticity sectors (typically manufacturing)
- Managing the external constraint, particularly the balance of payments, through industrial policy, export diversification, and real exchange rate policy

Later, structuralist macroeconomics and "new developmentalism" in Latin America formalized these ideas into models in which growth depends on the balance of payments, with industrial policy and exchange-rate management crucial for overcoming structural traps. For example, Porcile and Yajima (2021) emphasize that structuralist models link growth to export and import elasticities, technological capabilities, and the real exchange rate, reinforcing the idea that structural change is vital for long-term performance. These models clearly connect sectoral composition, external demand, and technological skills to long-term growth, showing that structural transformation is a macroeconomic and political-economic process, not merely a micro reallocation of resources.

The Post-Keynesian approach, by contrast, emphasizes effective demand, income distribution, and capacity utilization. In this view, growth is driven not by supply but by autonomous components of demand, income distribution, and expectations. When applied to dual economies, Post-Keynesian models reinterpret surplus labor through a demand-driven lens: structural transformation depends not only on capital accumulation but also on the strength of aggregate demand and the distribution of income between wages and profits. In this framework, growth and structural transformation rely on:

- Growth is demand-led, with regimes that can be wage-led or profit-led depending on the structure of the economy.

- Kaldor–Verdoorn effects link output growth to productivity growth, making industrial expansion a key driver of technological progress.

- Dualism is not only sectoral (agriculture vs. industry) but also institutional (formal vs. informal), and includes core vs. periphery within countries.

However, these two traditions have overlapped significantly, and recent literature has integrated aspects of both to explain structural transformation in dual economies. Rada (2007) exemplifies this integration by embedding Verdoorn productivity dynamics within a dual-economy framework, thereby bridging Structuralist concerns with heterogeneity and the Post Keynesian emphasis on demand-driven growth. More broadly, the Post Keynesian structuralist

literature, including structuralist development macroeconomics (Taylor, 1983; Ocampo, 2005) and new developmentalism (Bresser-Pereira, 2019), emphasizes the centrality of manufacturing, technological upgrading, and macroeconomic policy in shaping long-term growth paths. These integrative approaches underscore that dualism is not transitional but structural, requiring theoretical frameworks that combine external constraints with endogenous productivity segmentation.

We draw on this integrated approach to understand India's distinctive development experience in recent years. Building on the Kaldor-Verdoorn framework, the paper presents a simple one-sector theoretical model that links endogenous technological progress to the pattern of demand. This perspective extends the Post-Keynesian and Structuralist literatures, which have emphasized the importance of manufacturing, technological upgrading, and macroeconomic policy in shaping long-term growth paths (Taylor, 1983; Ocampo, 2005; Bresser-Pereira, 2019). By embedding endogenous productivity growth within a segmented productivity function, the model reveals additional constraints on structural transformation.

3. Historical context of the Indian economy

The developmental trajectory of the Indian economy in the post-independence period can be seen through the various macroeconomic constraints it faced at different points in time. These constraints are interdependent, so attempts to ease or solve one often lead to others. In the 1950s, soon after independence, economic management was influenced by the then-dominant Keynesian paradigm for macroeconomic policy and by the Latin American Dependency school for building a self-sufficient economy. However, the initial conditions did not exactly match the structural assumptions underlying Keynesian theory, particularly the presence of large-scale subsistence agriculture with surplus labor and unequal landholdings; there was recognition that constraints on development are more structural than simply a matter of stimulating effective demand.

The development literature at that time highlighted the key structural characteristics of less developed countries (LDCs) that hinder the sustainability of the capital accumulation process. Taking a cue from Keynes, investment was seen to play two roles: one, increasing aggregate demand; and the other, increasing productive capacity that can absorb surplus labor elsewhere in the economy. The latter, increasing productive capacity to absorb surplus labor, was considered more prescient during the early years of central planning, which was centered on the Mahalanobis model (1953).

The early development strategy of building the capital goods sector, or industrial capacity, to alleviate the capital goods constraint, at the expense of agriculture, proved costly in hindsight, as it left the economy with food shortages and a *wage-goods constraint* in the 1960s. Successive droughts and

India’s dependence on food imports, particularly amid the US withdrawal of food aid, culminated in the 1966 food crisis, which led to the currency crisis and the devaluation of the rupee. The policy response to these multiple crises was the *Green* Revolution in agriculture, which launched investments in agricultural infrastructure, research, and other services with a view to attaining self-sufficiency in food grains.

Although the successive crises in the 1960s strengthened resolve for self-reliance across domains, including military capability, industrial production, and agriculture, the original policy intent of the public sector reaching the commanding heights was weakened as the industrial licensing regime, known as the ‘license raj’, became rent-seeking and inefficient. The small capitalist class that benefited from protectionist policies became politically powerful and began to carve out more space for itself, albeit within the ambit of the industrial licensing regime, which lasted until the end of the seventies.

However, it was argued that the protectionist policy regime fostered inefficiencies across the system, particularly in the manufacturing sector, where there was little incentive to keep pace with frontier technology because the sector was well insulated by very high effective rates of protection. The cumulative impact of these inefficiencies became evident as the economy's long-term trajectory settled into a steady-state growth rate of 2-3 percent, known as the “Hindu” rate of growth (Lal 2005). The recognition that the economy would ultimately have to be opened was reflected in some of the legislation passed during the decade of the seventies. For example, legislative acts such as the *Monopolies and Restrictive Trade Practices Act* of 1970, the *Foreign Exchange Regulation Act* of 1973, and the *Patent Act* of 1970 point to the overall objective of protecting and promoting indigenous technology creation and shielding firms from foreign competition, while at the same time recognizing the inevitability of opening the economy (Ray 2015).

The tipping point for the abrupt transition came with the 1991 balance of payments (BOP) crisis, which forced a radical break with the past. Facing a severe shortage of foreign exchange to pay for imports, the Indian government sought an IMF bailout, which imposed stringent conditions on the loan, including a long-term structural adjustment program for the economy. The 1991 structural adjustment program, otherwise called “reforms,” marked a complete paradigm shift, launching the economy on a path of liberalizing government controls, expanding the private sector’s role, emphasizing the primacy of markets to boost competitive efficiency, and increasing integration with the world economy.

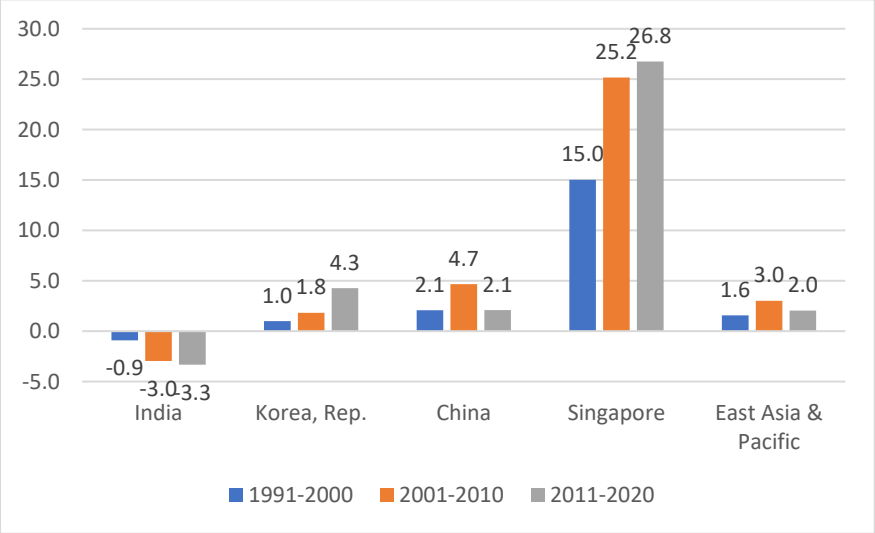
The structural reforms process, underpinned by the Monetarist economic doctrine, removed all quantitative restrictions on trade, including controls on foreign exchange, reduced tariff rates, and made the current account fully convertible, albeit with the capital account only partially convertible. The reforms also introduced a host of other liberal, investor-friendly, market-focused foreign investment policies. The reforms eliminated industrial licensing, opened the core sectors to private investment, and redefined the state's role as a market player by disinvesting from and privatizing large public-sector

enterprises. Finally, the reforms deregulated labor markets, and labor codes were continually amended to increase economic efficiency and achieve comparative advantage in trade.

The new policy framework involved opening the economy to trade and capital flows and adopting a floating exchange rate regime. These trade liberalization policies, along with a market-determined exchange rate, were perceived to ease the balance-of-payments constraint by improving the trade balance and enabling the Indian economy to replicate the success of export-led East Asian economies.

While the distinguishing feature of the East Asian export-led economies was the positive trade balance they mostly recorded after implementing trade liberalization, India's external balance during the post-liberalization period was markedly different. Instead of an improvement in the trade balance, the Indian economy continued to register a trade deficit throughout the post-liberalization period. Figure 2 shows the average decadal value of India's share of net exports in GDP compared with some of the export-led East Asian countries.

Figure 2: Trade balance as a share of GDP (%)



Source: World Development Indicator, World Bank

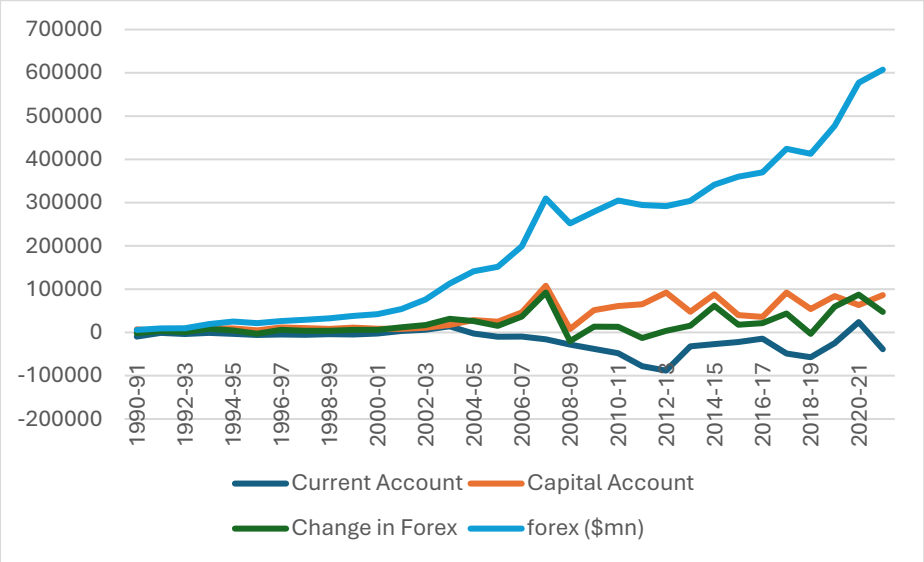
The deterioration in the trade balance was driven by a disproportionate rise in imports relative to exports. This pattern of a trade deficit and rising imports relative to exports is also noted by Blecker and Setterfield (2019), who report a trade balance of -3.5 percent of GDP and an export-to-import ratio of 0.85 for India during 2000-16.

3.1 Easing of Balance of Payments Constraint

Despite the negative trend in the trade balance, India's balance of payments constraint eased during the post-liberalization period due to higher capital inflows. Along with the stock of foreign exchange reserves, Figure 3 shows the trends in the balance of payments' flow components, namely, the current

account balance, the capital account balance, and the change in foreign exchange reserves, for the period 1991-92 to 2019-20.

Figure 3: Stock of Foreign Exchange Reserves and Flow of Components of Balance of Payments ($ million)



Source: Reserve Bank of India

Because changes in foreign exchange reserves equal the sum of the net balances in the current account, the capital account, and IMF transfers, the sharp rise in the capital account surplus increased foreign exchange reserves. Note that foreign investment comprises both foreign direct investment (FDI) and foreign portfolio investment (FPI). Although a large share of foreign investment was short-term FPI, the dominant form of FDI inflow was mergers and acquisitions of existing domestic firms (Rao et al., 2014). The nature of FDI in India differs from that in Southeast Asian countries and China, where it is characterized by export-oriented greenfield FDI projects (ibid). By implication, rather than augmenting exports and stimulating aggregate demand, higher foreign direct investment was largely associated with increased equity ownership in existing domestic firms. Nonetheless, such capital flows helped relax the balance-of-payments constraint in the Indian economy, which had become binding in the late 1980s and early 1990s.

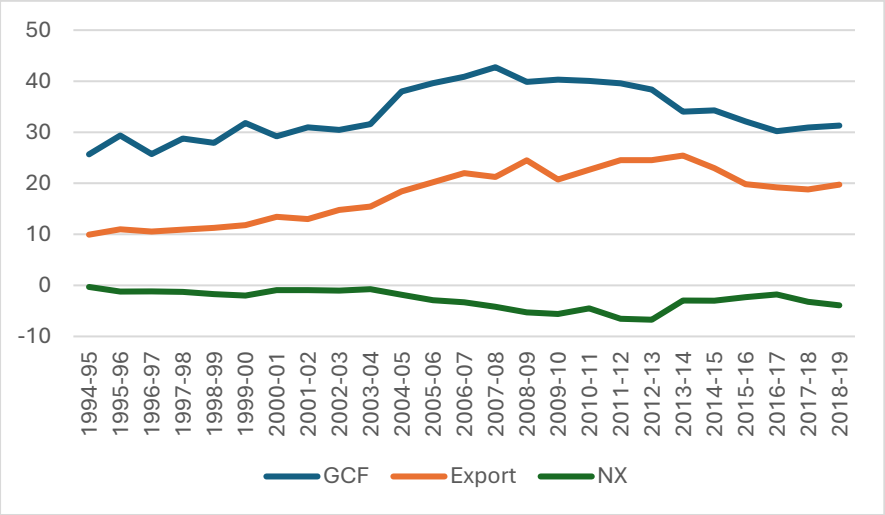
3.2 Export-driven Investment-led growth

As foreign exchange reserves accumulated, the nature of the binding constraint on India's growth changed qualitatively. Rather than the balance-of-payments constraint that characterized the Indian economy in 1991, the aggregate-demand problem became the binding constraint during the liberalization period. The new policy framework involved implementing austerity measures and a wave of privatization and disinvestment, leading to reductions in fiscal deficits and the share of public-sector

investment in GDP. Except for a few odd years, government expenditures played little role in stimulating India's growth during the post-liberalization period as a whole. Instead, India's high-growth episodes have been driven by private corporate investment (Nagaraj, 2013; Dasgupta, 2020).

Higher export growth rates provided the stimulus for private investment during these periods. Figure 4 shows the relationship between investment and exports by depicting the trends in their shares of GDP.

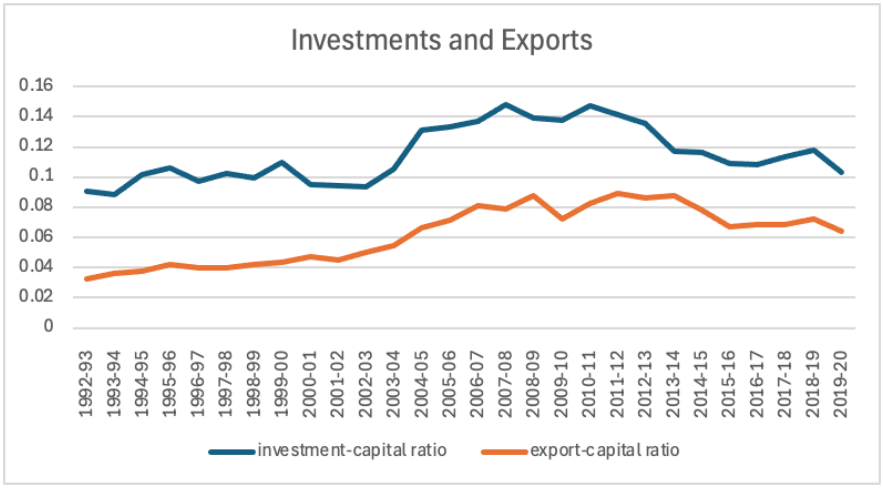
Figure 4: Share of Gross Capital Formation, Exports and Net Exports in GDP (%)

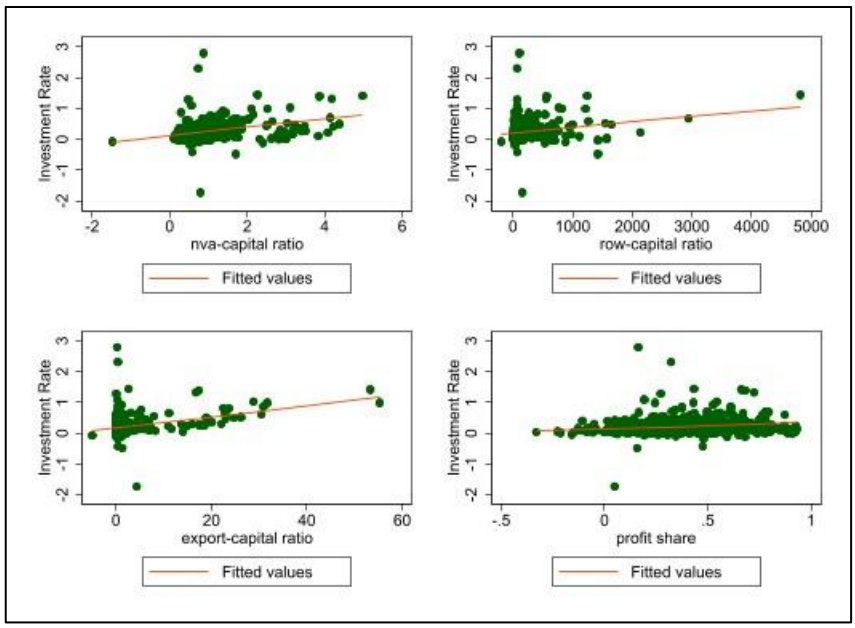


Source: Linked GDP series, National Statistical Commission and National Account Statistics, CSO

Using export and investment data for the registered manufacturing sector at the 2-digit level of ISIC revision 3.1, Figure 5a shows this phenomenon by depicting the relationships between the investment rate (the ratio of gross capital formation to capital stock) and the export-capital ratio, the ratio of rest-of-the-world imports to capital stock, and the profit share, respectively. The export-capital ratio and the ratio of rest-of-the-world imports to capital stock can be considered proxies for external demand. Further, in Figure 5b, the indicators of external demand and the capacity utilization rate exhibit statistically significant positive correlations with the investment rate (Dasgupta, 2022).

Figure 5a and 5b: Investment rate vis-à-vis exports and external demand





Source: Annual Survey of Industries (ASI), CSO

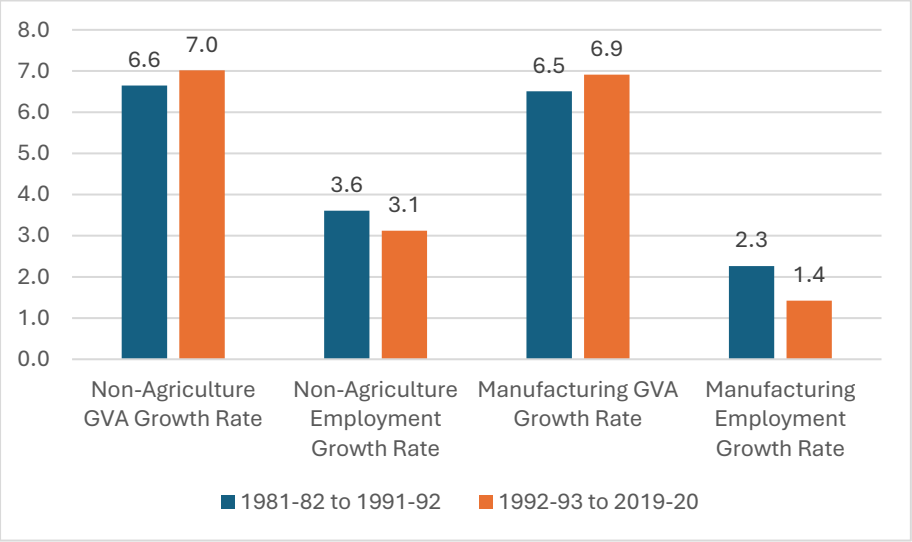
Thus, higher exports stimulated private investment, as evidenced by a positive and statistically significant relationship between the investment rate and the lagged values of exports and global demand, after controlling for changes in the capacity utilization rate and profit share. Interestingly, the real exchange rate showed no statistically significant relationship with exports during the liberalization period, and India's export trend appears to respond more to external demand than to price signals, contrary to neoclassical prescriptions.

3.3 Growth-Employment paradox

The post-liberalization growth process, largely driven by external demand, has been marked by jobless growth, in which the employment growth rate has been largely unresponsive to changes in the output and investment growth rates. While higher investment rates have been associated with higher output growth rates, the employment growth rate has shown weak responsiveness (Tejani, 2016; APU 2018).

Figure 6 depicts trends in the gross value added (GVA) growth rate and the employment growth rate in the non-agricultural sector (including both manufacturing and services) in general, and in the manufacturing sector in particular. While the average GVA growth rate during the post-liberalization period (1992-93 to 2019-20) was higher in the non-agricultural sector, the average employment growth rate was lower than in the 1980s (1981-82 to 1991-92). This pattern in the non-agricultural sector was largely driven by the manufacturing sector. Although the output growth rate in the manufacturing sector was broadly similar to that of the non-agricultural sector as a whole, the employment growth rate's responsiveness to output growth remained much weaker. Despite a rise in the output growth rate, the manufacturing employment growth rate declined by about 1 percentage point during the liberalization period.

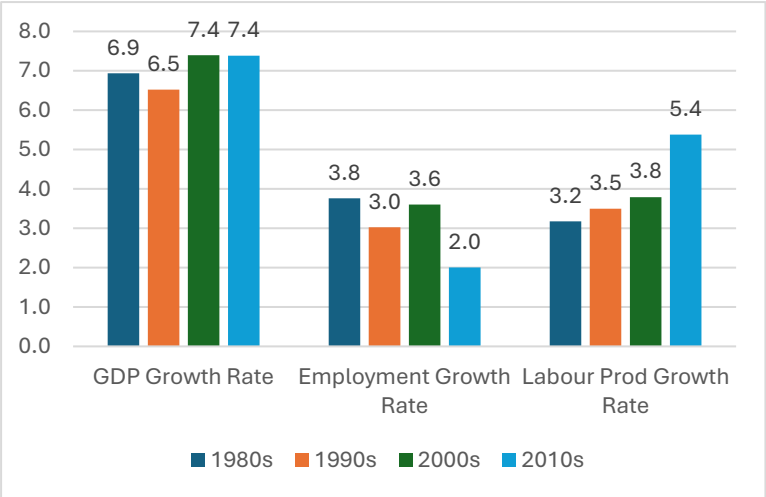
Figure 6: GVA Growth Rate, Employment Growth Rate in Non-Agricultural and Manufacturing sectors (%)



Source: Klems Database, Reserve Bank of India

Since the employment growth rate equals the output growth rate minus the labor productivity growth rate, any proportional or more-than-proportional rise in labor productivity growth relative to output growth should leave the employment growth rate unchanged or reduce it. The lack of responsiveness of employment growth to higher output growth indicates the role of labor productivity growth in India during the liberalization period, as seen in Figure 7.

Figure 7: GDP Growth rate, Employment growth rate and labour productivity growth rate



Source: Klems Database, Reserve Bank of India

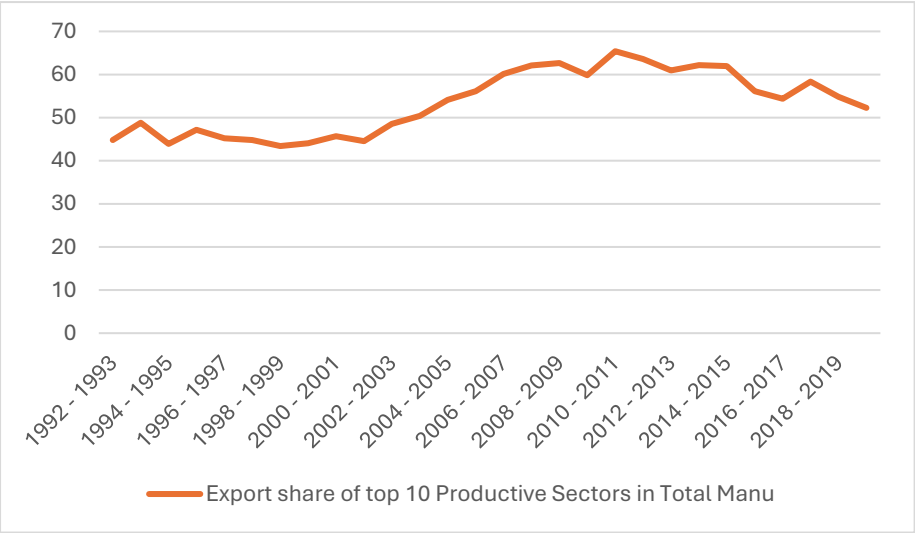
As Figure 7 shows, the decadal GDP growth rate in the Indian economy was markedly higher in the 2000s and 2010s than in the 1980s and 1990s. Yet despite this acceleration in output growth, employment growth remained virtually stagnant. This divergence implies that output expansion has been driven primarily by rapid increases in labor productivity rather than by employment absorption. The sharp rise in productivity growth lies at the heart of India's jobless growth problem and corroborates evidence of a very high Kaldor-Verdoorn coefficient in India (Tejani, 2016).

A high KV coefficient indicates that labor productivity growth responds more than proportionally to changes in output growth relative to employment growth. In India's case, this dynamic has shifted the economy onto an export-led growth path, in which the export sectors thrive on external demand, while employment absorption in the non-agricultural sector remains weak.

3.4 Segmented labour productivity across sectors

A closer look at the export basket reveals interesting patterns. First, the share of high-productivity sectors in total manufacturing exports has increased sharply, particularly since the 2000s, as shown in Figure 8. Other things remaining unchanged, this trend in export share would indicate a shift in demand toward products from high-productivity sectors.

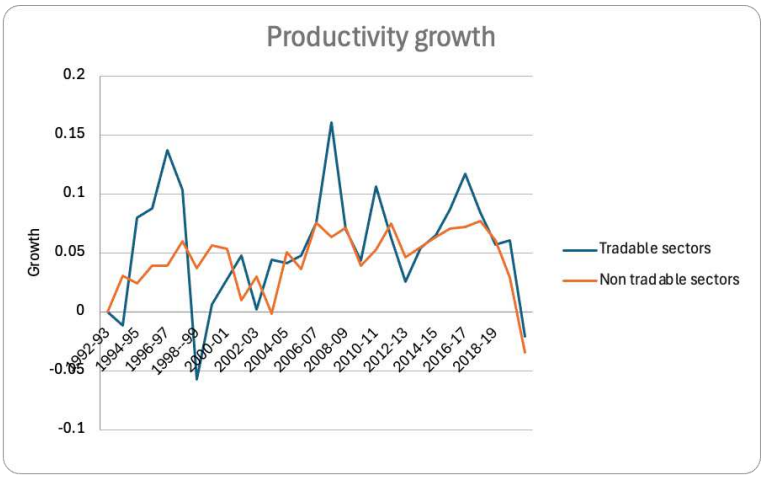
Figure 8: Export Share of High-Productivity Sectors in Manufacturing Exports

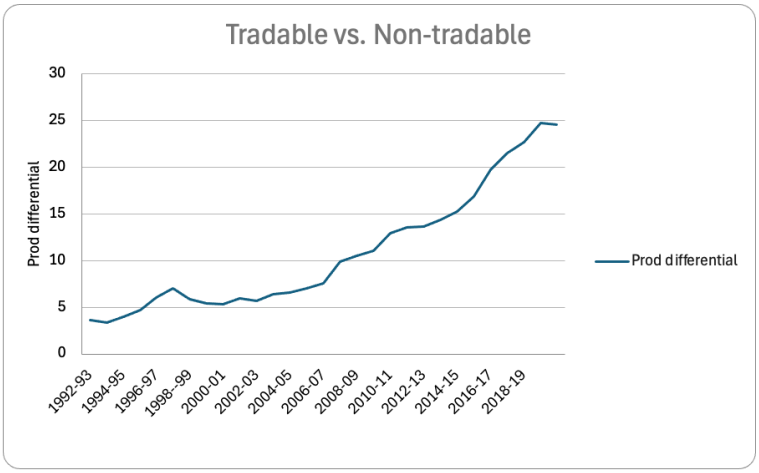


Source: Annual Survey of Industries (ASI), CSO

When we further coarse-grain the economy by dividing it into tradable and non-tradable sectors, productivity differentials reveal an ever-widening divide between the two. As Figure 9 shows, productivity growth in tradables, particularly export-oriented manufacturing and Business/ICT services, has consistently outpaced that of non-tradables, such as construction, retail, and informal services. This divergence is not episodic but persistent, and it continues to intensify over time.

Figure 9: Productivity growth: Tradable and Non-tradable sectors





Source: Klems Database, Reserve Bank of India

The implication is that India's dualism, unlike in Latin America and Africa, is reproduced not only between foreign enclaves and domestic sectors but also *within* the industrial sector. Tradables, sustained by external demand, exhibit strong Kaldor-Verdoorn dynamics, whereas non-tradables remain pinned near the negative intercept and cannot trigger productivity cycles. This internal segmentation underscores the fractured nature of India's structural transformation: headline GDP growth is driven by tradables, but employment absorption is weak and productivity is stagnant in non-tradables.

In a highly populous developing economy, the widening productivity gap between tradables and non-tradables has become a binding constraint on job creation and inclusive growth. This highlights the limits of an export-led growth regime in achieving broad-based structural transformation and reinforces the need for a theoretical model of segmented Kaldor-Verdoorn dynamics to help explain these persistent divergences.

4. Model

4.1 Basic building blocks

We set up a basic model to explore the segmented Kaldor-Verdoorn dynamics. The economy's export and import functions are given by equations (1) and (2), respectively. Exports (X) are positively affected by global demand (Y_f) and the real exchange rate (Z). The export elasticity of global demand and the real exchange rate are denoted by ϵ and η, respectively. Imports (M) are positively affected by domestic output and negatively affected by the real exchange rate. The import elasticity with respect to global demand and the real exchange rate are denoted by π and μ, respectively.

$$X = Z^{\eta} {Y_f}^{\epsilon} \qquad (1)$$

$$M = Z^{-\mu} Y^{\pi} \qquad (2)$$

where $\eta > 0;\ \epsilon > 0;\ \mu > 0;\ \pi > 0$.

In this model, rather than dividing the production sector into tradable and non-tradable components, we assume a one-sector economy with a segmented labor market composed of formal and informal workers. Firms hire their own workers from the formal labor market, where wages are tied to productivity, and subcontract part of their work to workers in the informal labor market, where wages are assumed to be fixed and not linked to productivity.

This formulation captures the essence of dualism within a one-sector model:

- Formal labor market: Productivity-linked wages, organized by trade unions and with bargaining power, endogenous to output growth, reflecting Kaldor-Verdoorn dynamics.
- Informal labor market: Exogenously given wages, disconnected from productivity, non-unionized, and characterized by weak bargaining power, reflecting the absorption of surplus labor without technological upgrading.

The coexistence of these two labor markets enables us to model how firms strategically combine high-productivity formal labor with low-wage informal subcontracting.

Domestic prices are set by a markup over the unit labour cost. The unit labour cost is assumed to be the sum of the labour costs of hiring the formal workers and the subcontracted informal workers at wage rates w and w_n, respectively.

The output per worker and the markup are denoted by λ and k, respectively. The relative wage rate between informal and formal workers is denoted by R.

$$p = \left(\frac{w}{\lambda} + \frac{w_n}{\lambda}\right) k$$

$$= \frac{w}{\lambda} Rk \qquad (4)$$

where $R = 1 + \frac{w_n}{w}$

At any given level of markup, the growth in prices ($\hat{p}$) is positively affected by the growth rates of the formal wage rate ($\hat{w}$) and the relative wage rate (g_r) and negatively affected by the growth rate of labor productivity (q), as given by

$$\hat{p} = \hat{w} + g_r - q \qquad (5)$$

where $g_r = \hat{R}$, $q = \hat{\lambda}$.

In this model, the conventional mechanism by which labor productivity growth responds positively to output growth through the Kaldor-Verdoorn (KV) channel is denoted by v_1 in equation (6). The KV coefficient is assumed to be a positive fraction, consistent with the standard Post-Keynesian insight that productivity growth is endogenous to output growth. We extend this conventional formulation by introducing an additional channel through which global demand growth (g_w), treated as exogenous, positively affects labor productivity.

This extension captures the negative productivity growth associated with the standard KV formulation's zero-output-growth limitation. In the standard model, if output growth stalls, productivity growth collapses. By incorporating global demand, we show that export sectors can sustain productivity growth even when domestic demand is weak. In effect, the productivity mechanism is segmented. While domestic firms remain constrained by the KV channel and pinned near the negative intercept when output growth is stagnant, firms producing export goods and services can use global demand to offset the zero-growth trap and sustain productivity cycles.

At any given output growth rate, the labour productivity growth rate is positively affected by the global demand growth (g_w). The growth rate of global demand is assumed to be exogenously given and positive throughout the exercise.

The extended Kaldor-Verdoorn mechanism is described by equation (6),

$$q = v_1 g + \theta g_w \qquad (6)$$

where $g = \hat{Y}$, $g_w = \hat{Y_f} > 0$, $\theta > 0; 0 < v_1 < 1$.

A non-negative θ reflects offsets from external demand; i.e., even when domestic output growth stalls, global demand sustains productivity growth in export sectors. The positive θ indicates the possibility of a technologically sophisticated export sector, whose labor productivity exceeds that of the non-tradable sectors at any given level of demand. This extension addresses the zero-output-growth limitation of the standard KV formulation, where productivity growth would otherwise collapse. By incorporating the term θg_w in (6), the model captures how export-oriented sectors are driven by global demand rather than constrained by

weak domestic demand, thereby formalizing the segmentation of productivity across the economy's sectors.

The growth rate of the nominal wage is assumed to depend on the bargaining power of formal workers and to be positively affected by the output growth rate, as described by equation (7).

$$\widehat{w} = \varphi_1 g \qquad (7)$$

$$\varphi_1 > 0$$

The nominal exchange rate and foreign prices are assumed to be exogenous. The level of the real exchange rate is given by equation (8), where the nominal exchange rate, domestic prices, and foreign prices are denoted by e, p, and p_f, respectively. The growth rate of the real exchange rate is given by equation (9).

$$Z = \frac{ep_f}{p} \qquad (8)$$

$$\hat{Z} = -\hat{p} \qquad (9)$$

The level of employment (L) is the ratio of output (Y) to labor productivity (λ) as in equation (10). The employment growth rate in the formal sector (g_L) is given by the difference between the output growth rate and the labor productivity growth rate as in equation (11).

$$L = \frac{Y}{\lambda} \qquad (10)$$

$$g_L = g - q \qquad (11)$$

The balance of payments will be in equilibrium if the nominal value of exports, measured in the domestic currency, equals the nominal value of imports, also measured in the domestic currency, as in equation (12). Log-differentiating both sides of equation (12), followed by further substitutions and simplifications, yields the balance of payments (BOP) growth condition in equation (13).

$$pX = ep_f M \qquad (12)$$

$$\hat{X} = \hat{Z} + \widehat{M} \qquad (13)$$

The steady-state equilibrium and comparative dynamics of the model are derived under the assumption of balanced growth throughout the exercise, as in equation (13).

4.2 Steady State Equilibrium

The steady-state growth rate equals the BOP-constrained growth rate. The system of equations (1)-(13) yields two distinct behavioral equations- the BOP-constrained growth (BOPCG) function and the employment growth function.

Substituting equations (1)-(5), (7), and (9) into (13) yields the BOP-constrained growth function, given by

$$g = \frac{\epsilon g_w - \beta g_r}{\pi + \beta\varphi_1} + \left(\frac{\beta}{\pi + \beta\varphi_1}\right) q \qquad (14)$$

where $\beta = \mu + \eta - 1 \geq 0$.

For any given growth rate of global demand (g_w) and relative wage rate (g_r), the BOPCG function (14) yields a locus of combinations of the output and productivity growth rates that maintain balance-of-payments equilibrium.

The parameter β equals the sum of the export and import elasticities of the exchange rate and is often referred to as the Marshall-Lerner (ML) parameter. For simplicity, the ML parameter is assumed to be non-negative, i.e., $\beta = \mu + \eta - 1 \geq 0$. Depending on the value of the ML parameter, the BOPCG regimes are divided into 2 categories: (i) *exchange-rate elastic* and (ii) *exchange-rate inelastic*. The BOPCG regime is described as exchange rate-elastic if the ML condition holds and $\beta > 0$. The BOPCG regime is described as exchange rate-inelastic if the ML condition does not hold and $\beta = 0$.

The employment function (15) expresses the relationship between employment growth and the output growth rate. Using the productivity function in (5) and the definition of the employment growth rate in (6), the employment function can be expressed as,

$$g_L = (1 - v_1)g - \theta g_w \qquad (15).$$

We can now analyze the relationship among the output growth rate, productivity growth rate, and employment growth rate using Figures 10 and 11. The vertical axis of both figures measures the output growth rate. The horizontal axis, on the right-hand side (quadrant 1), measures the productivity growth rate (q), and on the left-hand side (quadrant 2), we measure the employment growth rate (g_L).

Quadrant 1 shows the BOPCG line as in equation (14) and indicates how the magnitude of the BOP-constrained output growth rate responds to changes in the productivity growth rate.

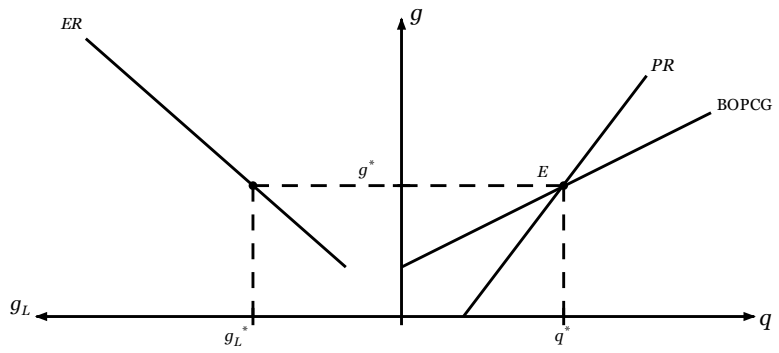
The slope and intercept of the BOPCG line are $\frac{\beta}{\pi+\beta\varphi_1}$ and $\frac{\epsilon g_w-\beta g_r}{\pi+\beta\varphi_1}$, respectively. The PR line in quadrant 1 represents the productivity function (6) in the (g,q) space and shows that the magnitude of the productivity growth rate varies with the output growth rate. The slope and intercept of the PR line are $\frac{1}{v_1}$ and $-\frac{\theta g_w}{v_1}$, respectively.

In quadrant 1 of both figures, the intersection of the BOPCG and PR lines determines the equilibrium output and productivity growth rates. The necessary conditions for positive equilibrium output growth are- (i) the intercept of the BOPCG line is positive, i.e., $\frac{\epsilon g_w-\beta g_r}{\pi+\beta\varphi_1} > 0$, and (ii) the slope of the BOPCG line is flatter than the PR line, i.e., $\frac{\beta}{\pi+\beta\varphi_1} < \frac{1}{v_1}$.

The ER line in quadrant 2 shows the employment function (15) and indicates the magnitude of the employment growth rate's response to the output growth rate *at any given level of global demand*. The slope and intercept of the ER line are $(1-v_1)$ and $-\theta g_w$, respectively. In quadrant 2, the equilibrium employment growth rate is determined by the equilibrium output growth rate for any given employment line. We now analyze two cases: elastic exchange rate ($\beta > 0$) and inelastic exchange rate ($\beta = 0$).

Figure 1 shows the case for an elastic exchange rate with $\beta > 0$. Here the BOPCG line is positively sloped. It indicates that the productivity growth rate positively affects the output growth rate through the real exchange rate channel. Since the domestic inflation rate is negatively affected by the productivity growth rate, a higher productivity growth rate leads to higher exports and output growth rate by increasing (depreciating) the real exchange rate.

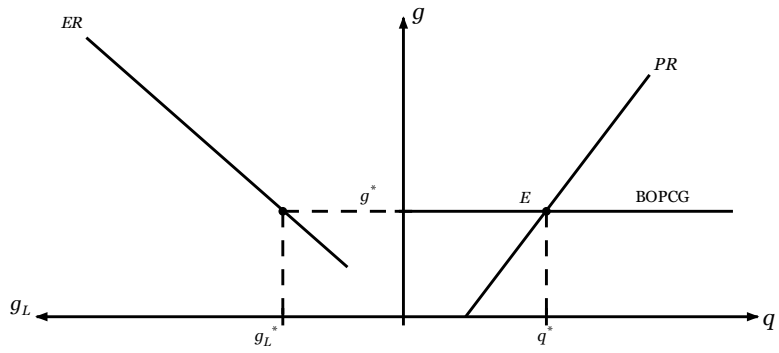
Figure 10: Steady State Equilibrium under Elastic Exchange Rate



Source: Authors' own

Figure 11 shows the case of an inelastic exchange rate with $\beta = 0$. Here, the BOPCG line is horizontal. The productivity growth rate does not affect the output growth rate because there is no exchange-rate channel.

Figure 11: Steady State Equilibrium under Inelastic Exchange Rate



Source: Authors' own

The steady-state values of the output growth rate, productivity growth rate, and employment growth rate can be derived from equations (6), (14), and (15), and are given by

$$g^* = \frac{(\epsilon + \beta\theta)g_w - \beta g_r}{\pi + \beta(\varphi_1 - v_1)} \tag{16}$$

$$q^* = \left[\frac{v_1(\epsilon + \beta\theta)}{\pi + \beta(\varphi_1 - v_1)} + \theta\right] g_w - \frac{v_1 \beta g_r}{\pi + \beta(\varphi_1 - v_1)} \tag{17}$$

$$\widehat{L^*} = \left[\frac{(1-v_1)(\epsilon+\beta\theta)}{\pi+\beta(\varphi_1-v_1)} - \theta\right] g_w - \frac{(1-v_1)\beta g_r}{\pi+\beta(\varphi_1-v_1)} \qquad (18)$$

For an economically meaningful equilibrium, the steady-state output growth rate must be positive. From (16), we can see that both the numerator and denominator must be positive for g^* to be positive. Since $\beta\theta \geq 0$, the numerator will necessarily be positive if $\epsilon g_w - \beta g_r > 0$. This condition is the same as the condition for the intercept term of the BOPCG line (14) to be positive $\left(\frac{\epsilon g_w - \beta g_r}{\pi+\beta\varphi_1} > 0\right)$, since both $\pi > 0$ and $\beta\varphi_1 \geq 0$. The condition for the denominator to be positive is given by $\frac{\beta}{\pi+\beta\varphi_1} < \frac{1}{v_1}$, which implies that the slope of the BOPCG line is flatter than the PR line (6). The flatter BOPCG line vis-à-vis the PR line guarantees stability of the steady state, which is the same as in the class of cumulative causation models - the response of the output growth rate to changes in the productivity growth rate is more sluggish than the response of the productivity growth rate to changes in the output growth rate.

4.3 Comparative Dynamics

This section examines how the growth rate of global demand and the relative wage rate affect the equilibrium output, productivity, and employment growth rates.

The effect of the change in global demand on the equilibrium output growth rate is expressed by

$$\frac{\partial g^*}{\partial g_w} = \frac{\epsilon + \beta\theta}{\pi+\beta(\varphi_1-v_1)} \qquad (19)$$

Since both $\pi+\beta(\varphi_1-v_1) > 0$ and $\epsilon+\beta\theta > 0$, the partial derivative, $\frac{\partial g^*}{\partial g_w}$ is unambiguously positive. This implies that growth in global demand unambiguously increases the steady-state output growth.

The effect of the change in global demand on the equilibrium productivity growth is given by

$$\frac{\partial q^*}{\partial g_w} = \frac{v_1(\epsilon + \beta\theta)}{\pi+\beta(\varphi_1-v_1)} + \theta \qquad (20)$$

Since both the denominator, $\pi+\beta(\varphi_1-v_1)$, the numerator $v_1(\epsilon+\beta\theta)$, and θ are all positive, the partial derivative, $\frac{\partial q^*}{\partial g_w}$, is unambiguously positive. This is an important result because it highlights the implications of our segmentation hypothesis. By unambiguously increasing

productivity growth, global demand growth offsets the adverse effects of weak domestic demand for exporting firms.

In other words, when the Kaldor-Verdoorn mechanism is extended to include the global demand channel, it shows that productivity growth in export sectors is sustained by θg_w. This ensures that even when domestic output growth stalls, productivity growth does not collapse.

Finally, the effect of the change in global demand on the equilibrium employment growth rate is expressed as

$$\frac{\partial \hat{L}^*}{\partial g_w} = \frac{(\epsilon + \beta\theta)(1 - v_1)}{\pi + \beta(\varphi_1 - v_1)} - \theta \qquad (21)$$

The sign of the partial derivative is ambiguous and depends on whether the magnitude of the KV coefficient is greater than or equal to the critical value $v_c = 1 - \frac{\theta\pi}{\epsilon}$, i.e.,

$$\frac{\partial \hat{L}^*}{\partial g_w} > 0 \; if \; v_1 < 1 - \frac{\theta\pi}{\epsilon} \qquad (21\, c_1)$$

$$\frac{\partial \hat{L}^*}{\partial g_w} \leq 0 \; if \; v_1 \geq 1 - \frac{\theta\pi}{\epsilon} \qquad (21\, c_2)$$

The above conditions are notable because introducing global demand into the conventional Kaldor-Verdoorn mechanism has narrowed the range of KV coefficient values that produce a positive effect on employment growth. Specifically, in condition $(21\, c_1)$, the presence of a non-negative θ makes the inequality more stringent by reducing the permissible range of v_1. This highlights the adverse impact of global demand on employment generation, as productivity gains driven by external demand do not translate into proportional increases in employment growth.

Moreover, with a larger non-negative θ, the critical value v_c can turn negative, thereby making condition $(21\, c_2)$ easier to satisfy. This implies that the larger the impact of global demand on productivity (θ), the greater the adverse effect on equilibrium employment growth. In other words, while global demand offsets weak domestic demand in sustaining productivity growth, it simultaneously exacerbates the jobless growth problem by tightening the conditions under which employment growth remains positive.

This result again highlights the implications of the segmentation hypothesis: export-oriented sectors benefit from global demand offsets, but the mechanism of productivity growth itself can become increasingly biased against employment generation. India's post-liberalization experience suggests that the demand pattern may play an additional role in sustaining dualism in the labor market.

The effect of the change in the relative wage rate on the equilibrium output growth rate is given by equation (22). Since $\pi + \beta(\varphi_1 - v_1) > 0$ and $\epsilon > 0$, the partial derivative is unambiguously positive. In the case of an inelastic exchange rate,

$$\frac{\partial g^*}{\partial g_r} = -\frac{\beta}{\pi + \beta(\varphi_1 - v_1)} \leq 0 \qquad (22)$$

The partial derivative is negative if the ML condition holds with $\beta > 0$ and the BOPCG regime is exchange rate-elastic as in condition (22-c3). The partial derivative is zero if the ML condition holds with $\beta = 0$ and the BOPCG regime is exchange rate-inelastic, as in condition (22-c4).

$$\frac{\partial g^*}{\partial g_r} < 0 \; if \;\; \beta > 0 \qquad (22 - c3)$$

$$\frac{\partial g^*}{\partial g_r} = 0 \; if \;\; \beta = 0 \qquad (22 - c4)$$

The effect of the change in global demand on the equilibrium employment growth rate is given by equation (23). Since $0 < v_1 < 1$, the sign of the partial derivative depends on the sign of the β. The partial derivative $\frac{\partial \hat{L}^*}{\partial g_r} < 0$ if $\beta > 0$ and $\frac{\partial \hat{L}^*}{\partial g_r} = 0$ if $\beta = 0$, as in condition (23-c5).

$$\frac{\partial \hat{L}^*}{\partial g_r} = -\frac{\beta(1 - v_1)}{\pi + \beta(\varphi_1 - v_1)} \qquad (23)$$

$$\frac{\partial \hat{L}^*}{\partial g_r} \leq 0 \; if \; \beta \geq 0 \qquad (23 - c5)$$

Depending on the values of the ML parameter and the KV coefficient, the model distinguishes four distinct cases: Case 1 pertains to the exchange rate-elastic BOPCG and low-KV productivity regime with $\beta > 0, v_1 < v_c$; Case 2 pertains to the exchange rate-inelastic BOPCG and low-KV productivity regime with $\beta = 0, v_1 < v_c$; Case 3 pertains to the exchange rate-elastic BOPCG and high-KV productivity regime with $\beta > 0, v_1 \geq v_c$; Case 4 pertains to the exchange rate-inelastic BOPCG and high-KV productivity regime with $\beta = 0, v_1 \geq v_c$.

Table 1 summarizes the effect of global demand and the relative wage rate on equilibrium output and the employment growth rate.

Table 1: Comparative Statics under 4 cases

	Case 1	Case 2	Case 3	Case 4
$\frac{\partial g^*}{\partial g_w}$	$+$	$+$	$+$	$+$
$\frac{\partial \hat{L}^*}{\partial g_w}$	$+$	$+$	$0/-$	$0/-$
$\frac{\partial g^*}{\partial g_r}$	$-$	0	$-$	0
$\frac{\partial \hat{L}^*}{\partial g_r}$	$-$	0	$-$	0

Source: Authors' own

The analysis points towards the following implications. First, while higher global demand unambiguously raises the output growth rate, its effect on the employment growth rate can remain ambiguous even if the KV coefficient is a positive fraction. Only in Cases 1 and 2 do both the output and employment growth rates respond positively to global demand. In cases 3 and 4, the economy is characterized by a jobless or job-loss employment regime, with the partial derivative of the employment growth rate being zero or negative. Second, the squeeze in the relative wage rate of subcontracted workers can stimulate output and employment growth only under cases 1 and 3, through the export channel. In cases 2 and 4, where the BOPCG regime is exchange rate-inelastic, relative wage squeeze does not improve output and employment growth. Third, under case 4, the employment growth rate would remain unaffected by higher global demand and relative wage squeeze even if the KV coefficient is a positive fraction.

We can now summarize the results of our model, compared with models within the conventional Kaldor-Verdoorn framework, in Table 2. The main difference between our model and the conventional Kaldor-Verdoorn approach is the introduction of the demand pattern parameter (θ) into the labor productivity growth and output growth relationship.

Table 2: Conventional versus Extended model: Binding constraints

	KV/BOPCG (θ=0)		Extended KV/BOPCG (θ>0)	
	KV≥1	KV<1	$0 \leq KV < KV_c$	$KV_c \leq KV < 1$
Effect of Exports on Growth	Positive	Positive	Positive	Positive
Effect of Exports on Employment	Positive	Zero/Negative	Positive	Zero/Negative
Binding constraint on Structural Transformation	***Technological***	***Balance of Payments (BOP)***	***Balance of Payments (BOP)***	***Demand pattern***

Source: Authors' own

In Table 2, the conventional KV/BOPCG models (where $\theta = 0$) are divided into two regimes – those with $KV \geq 1$ and those with $KV < 1$. The extended KV/BOPCG model (where $\theta > 0$) outlined in this paper is also divided into 2 regimes-one with $KV < KV_c$ and the other with $KV \geq KV_c$, where KV_c denotes the critical value of the KV coefficient as shown in eq (21) and conditions (21-c.1 and 21-c.2). We compare the effect of exports on growth and structural transformation across these regimes in the two theories. In the last row, we note the binding constraint on structural transformation for each case in these two scenarios.

Exports' effect on the output growth rate is unambiguously positive across all regimes in both models. However, the key distinctions emerge in the context of exports' effect on structural transformation and the nature of binding constraints. In the conventional model, export growth unambiguously increases employment in the $KV < 1$ regime.

When production is relatively more labor-intensive, export growth can be a sufficient condition for structural transformation, and the binding constraint is either macroeconomic (BOP) or structural. The Latin American and African experiences can be seen through this regime. The Latin American experience highlights how the BOP constraint, expressed through stop-go cycles, impeded structural transformation. The African case, in which resource enclave productivity does not diffuse to the wider economy, highlights the structural constraint on structural transformation. In both cases, while exports drove growth, the macroeconomic and structural constraints became binding and prevented the full realization of structural transformation.

In the case of $KV \geq 1$, the export growth rate would have no effect or a negative effect on the employment growth rate, despite an unambiguously positive effect on overall growth. This is because the negative effect of the labor productivity growth rate cancels out the positive effect of the output growth rate when the KV coefficient is high. In this case, the binding constraint on structural transformation is technological. Relaxing the BOP constraint by itself does not guarantee structural transformation in this case. However, such a constraint arises only when KV is very high.

However, our extended model shows the counter result in $KV_c \leq KV < 1$ the regime. Essentially, it shows that when the source and pattern of demand are considered, the conventional result that exports drive structural transformation can be called into question even if KV < 1. Unlike conventional models, our model identifies a specific threshold value KV_c, which serves as a bifurcation point: export growth generates employment only below that threshold. In other words, export growth ceases to be a sufficient condition for structural transformation even in a moderately low KV regime when $KV_c \leq KV$, i.e., the actual KV value is greater than the threshold. It is only when the actual KV value is less than the threshold, i.e., $KV_c > KV$ that higher exports act as a sufficient condition for higher employment growth rate in this regime.

The economic intuition follows from the positive relationship between a country's per capita income and demand for technologically sophisticated products. Developing countries that depend on export growth must align their production with demand patterns in developed countries. Therefore, production in the tradable sector of developing countries that aim to meet export demand in developed countries must be qualitatively different from that in the non-tradable sector. This difference, or the segmented productivity differential, between the tradable and non-tradable sectors further restricts the ability of output growth to generate employment and, hence, its impact on structural transformation. The threshold KV value reflects the plausibility of the demand pattern being a binding constraint on structural transformation.

5. Conclusion

The comparative developmental experiences of developing countries demonstrate that not only has the Lewisian process of structural transformation failed to materialize, but dualism has also persisted as a structural feature of postcolonial development. These experiences highlight the diverse pathways through which development embeds duality.

Post-Keynesian and Structuralist theories seeking to explain structural transformation have highlighted a set of binding constraints, including limited autonomous demand, balance-of-payments pressures, structural bottlenecks, and a high Kaldor-Verdoorn coefficient. By implication, in economies where the dominant constraint stems from autonomous demand or the external balance, sustained export growth under a low Kaldor–Verdoorn coefficient can be sufficient to raise labor demand and thereby aid structural transformation. However, this reasoning rests on the assumption that the composition of external demand is stable. In practice, external demand evolves with global economic growth, shifting toward new technologies, products, and sectors. Consequently, export growth alone cannot guarantee structural transformation unless accompanied by diversification and upgrading that align domestic production with changing patterns of world demand.

A closer look at the Indian economy shows that the shifting pattern of external demand is reflected in the rising share of high-productivity sectors in total manufacturing exports, particularly since the 2000s (Figure 8). Consequently, the productivity differential between high-productivity export sectors and low-productivity non-tradable sectors has become persistent and has intensified over time (Figure 9).

The implication is that India's dualism, unlike in Latin America and Africa, is reproduced not only between foreign enclaves and domestic sectors but also within industry itself. Tradables, sustained by external demand, exhibit strong Kaldor-Verdoorn dynamics, whereas non-tradables remain pinned near the negative intercept and cannot trigger productivity cycles. This domestic segmentation highlights the limits of an export-led growth regime in achieving broad-based structural transformation and reinforces the need for a theoretical model of segmented Kaldor-Verdoorn dynamics that captures these persistent divergences.

We explore the role of the demand pattern in structural transformation using a segmented productivity function (6), where the parameter θ captures the offsets from external demand, i.e., even when domestic output growth stalls, global demand sustains productivity growth in export sectors. The extended BOPCG model with the segmented productivity function is then developed in Section 4 to examine whether a) the responsiveness of labor demand to the output growth rate depends on the pattern of demand, and b) higher export and output growth rates constitute a sufficient condition for structural transformation under a low KV coefficient regime.

The theoretical model developed in Section 4 provides some interesting answers to these questions. First, the effect of global demand growth on productivity growth is unambiguously positive (20). By unambiguously increasing productivity growth, global demand growth offsets the adverse effects of weak domestic demand for exporting firms. This result confirms our segmentation hypothesis. In simple terms, when the Kaldor-Verdoorn mechanism is extended to include the global demand channel, productivity growth in export sectors is sustained by global demand, providing an offset even when domestic output growth stalls and ensuring that productivity growth does not collapse.

Second, the impact of changes in global demand on the equilibrium employment growth rate becomes ambiguous, depending on whether the Kaldor–Verdoorn (KV) coefficient exceeds or equals the critical threshold v_c defined in (21). Introducing global demand (θ) into the conventional KV framework narrows the range of coefficient values that yield a positive effect on employment growth. Stated differently, the presence of a non-negative θ makes the inequality more stringent- a rise in exports driven by stronger global demand may not suffice to generate employment growth when KV values fall below the threshold. Conversely, for KV values above the threshold, the adverse influence of global demand on equilibrium employment growth can exceed what the conventional framework implies. The intuition is that global demand can compensate for weak domestic demand, thereby sustaining productivity growth. Yet it intensifies the jobless growth problem by tightening the conditions under which employment growth remains positive.

The threshold KV value, one of the principal findings of the extended BOPCG model, yields a counterintuitive result in the KV<1 regime. In this regime, export growth ceases to be a sufficient condition for structural transformation when $KV_c \leq KV$. Only when the actual KV value is less than the threshold, i.e., $KV < KV_c$, do higher exports become a sufficient condition for a higher employment growth rate in this regime. This, in essence, reflects the segmented productivity differential between the tradable and non-tradable sectors, which restricts the ability of output growth to generate employment and, hence, reflects the plausibility of the demand pattern as a binding constraint in the process of structural transformation.

This finding highlights the dual role of export-led growth in populous developing economies. While an export basket more aligned with global demand patterns may ease the balance-of-payments constraint, it simultaneously deepens the productivity gap between tradables and non-tradables, perpetuating structural dualism. Our contribution lies in identifying the

threshold KV value that reveals this dual role within the Balance-of-Payments Constrained Growth (BOPCG) framework.

From a policy perspective, the KV coefficient's critical threshold underscores the need for a well-rounded industrial policy that complements export-oriented strategies with measures to strengthen domestic productivity and demand in non-tradable sectors. A strong domestic non-tradable sector serves as a safety net for the tradable sector during external crises by cushioning external shocks and ensuring that growth is not wholly dependent on volatile global demand. Growth and trade policies must move beyond treating exports as an unqualified engine of development, particularly in developing-country contexts. They must explicitly acknowledge the dual role of exports – both as a means of easing external constraints and as a potential source of internal structural imbalance when non-tradable sectors are neglected.

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