DISSERTATION

THREE ESSAYS ON GLOBALIZATION OF TRADE AND STRUCTURES OF ECONOMIC GROWTH AND (UNDER) DEVELOPMENT: COMPARATIVE ANALYSIS OF ADVANCED AND EMERGING NATIONS

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In partial fulfillment of the requirements

For the Degree of Doctor of Philosophy

Colorado State University

Fort Collins, Colorado

Spring 2020

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ABSTRACT

THREE ESSAYS ON GLOBALIZATION OF TRADE AND STRUCTURES OF ECONOMIC GROWTH AND (UNDER) DEVELOPMENT: COMPARATIVE ANALYSIS OF ADVANCED AND EMERGING NATIONS

With the rise of neoliberal perspectives on economic policy and development in the 1980s came a new phase of globalization in the world economy. Quantitative increases in trade and financial flows, coupled with qualitative changes in corporate strategy and governance have been elemental to this process. Globalization of trade and production has integrated developed and underdeveloped regions of the world in a process of capitalist expansion and accumulation, one that has at times delivered bouts of growth in some countries, but little in terms of economic development or improvements in employment in others. This dissertation seeks to understand linkages between the globalization of trade and structures of development and under-development.

Chapter 1 empirically evaluates the impact of trade and globalization on the quality of employment, particularly wage inequality by skill type and the functional distribution of income. This paper argues that rather than changes in relative prices, the link between trade and wage inequality is better explained by the mechanism of skill-intensity reversals. This is evident in trade's negative impact on less-skilled labor's skill intensity in production. Particularly for emerging nations, gains from external integration based on exploiting resource or skill-based differences in comparative advantage seems to have become transitory over time.

Chapter 2 models the multifaceted impacts of trade and globalization on economic growth, using principal component analysis to differentiate among groups of countries based on how global capital interacts with domestic macroeconomic structures. This paper ties together a wide range of structuralist growth models to provide a unified narrative on regimes of globalization and growth.

Chapter 3 evaluates the impact of trade globalization on economic development through its impact on structural change. This paper groups the analysis of regional differences in structural change in the development literature into three broad categories. Data on sectoral composition of value-added trade, output and employment is used to emphasize these regional dynamics, highlighting how internal and external constraints on the industrial sector lie at the heart of these challenges.

ACKNOWLEDGMENTS

The work undertaken in this thesis owes entirely to the dedicated and compassionate support and encouragement of my supervisor and mentor Prof. Elissa Braunstein. Her guidance has been pivotal in locating and shaping my preliminary ideas motivated by field work into a larger project on international development. She has taught me how to juxtapose theoretical and empirical research in original, critical and rigorous ways from a political economy perspective. I have and continue to follow her work with keen interest, which motivates my own research as in the empirical approach in Chapter 2. I also thank her for the excellent lectures on international trade and political economy of race and gender, and for introducing me to essentialities in race theory. Finally, I thank her for her work as the Chair of the Economics Department in ensuring a highly conducive and collaborative research and learning environment.

This dissertation owes its completion and contribution equally to my mentor and co-advisor Prof. Ramaa Vasudevan. I feel extremely fortunate to be educated and guided in research by such an exemplary scholar and human being. I thank her for her eager guidance, unending patience in editing and constant encouragement and support. Her willingness to collaborate on research with me has not only enhanced my research aptitude but also taught me numerous things that are hard to quantify. I thank her for her fascinating lectures in international finance which opened up a new horizon of research for me that I had limited exposure to. I also thank her for constantly broadening the horizon of this research and my critical thinking, and for all the intellectually stimulating discussions from the world of academia and beyond.

I would also like to thank Dr. Daniele Tavani, Dr. Sammy Zahran, and Dr. Dimitris Stevis for being ideal committee members, as their exceptional critical feedback has strongly shaped the

thesis and future work that emanates from it. Particularly, I would like to thank Sammy Zahran for being a great mentor and for fascinating intellectual conversations on economics, politics, and society. I thank Daniele Tavani for his dedicated efforts as the Graduate Program Coordinator to diversify and strengthen student faculty relationships.

I thank Alison Koss and Rosanna Houlton in the Office of the Department of Economics, for constantly reminding me of official deadlines and for showing continued patience with all delays on my part. I also thank all faculty, grad students, and staff at CSU who made this experience a thoroughly enjoyable one.

I would also take this opportunity to thank all the people I worked and learned from at the Society for Labor and Development, Mazdoor Ekta Manch, and New Trade Union Initiative in India. Experience of working on conditions of employment in garment subcontracting industries entirely motivates the research undertaken in this thesis.

I profusely thank my parents for being pillars of support and encouragement and for teaching me many things in life that are difficult to quantify. My brother Archan, who is the best friend and mentor I could ever ask for, and I still continue to emulate his pursuits in many ways.

I thank all my friends so far, particularly Anu, Akshara, Vipin, Vikas, Ankush, Ranjani, Harini, Faisal, Avishek, Neha, Rakesh, Prabhjot, Siddharth, Matt, Thom and Hyeyoon who have been like a family to me and the best support group I could have ever desired. I would also like to sincerely acknowledge some of the many priceless friendships in the department that I have developed. Anil Bolukoglu for being an inspiring Marxist thinker and a phenomenal friend. Kim Kakpo for his eager feedback on my research and for countless debates on economic development. Mike Trouw for being an amazing friend, ideal classmate and fellow traveler through the ups and downs of the

PhD process. Sanchari for being ever so willing and eager to help me out with editing and proofreading of several drafts of my chapters. Nik for being the best roommate and for introducing me to the world of drums and percussions. Finally, David Ward for being the ideal traveling companion on countless outdoorsy adventures through the US and beyond.

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1.1. Introduction

A new phase of globalization has been evident in the world economy since 1980s. Quantitative increases in trade and financial flows coupled with qualitative changes in corporate strategy and governance have been integral to this process. Globalization of trade and production has integrated developed and underdeveloped regions of the world in a single unified process of capitalist expansion and accumulation. Global fragmentation of production combined with international division of labor facilitated the rapid spread of global value chains (GVCs) or trade in tasks and intermediate inputs.

Supply chain studies have maintained that developing nations can benefit from participating in GVCs by moving from captive or hierarchical governance structures (or inter-firm networks) to modular and relational ones. As firms upgrade into higher governance structures within a chain or network, they invest in skill development, training and incentive structures for its workforce, thus upgrading from low-road to high-road models of labor relations (Gereffi et. al., 2001, 2005; Barrientos et. al., 2010; Ramaswamy and Gereffi, 1998). Criticisms have pointed to linear conceptualization of value chains or governance structures (Henderson et. al., 2005), and data disputing the claim that firm upgrading goes together with high-road models of labor (Knnoringa and Pegler, 2006).

This paper aims to (theoretically and empirically) investigate how globalization of trade impacts labor market outcomes, particularly in terms of quality of employment. Mainstream comparative advantage-based trade theories maintain that the impact of trade integration on factor payments is mediated through change in relative prices. This is evident in Heckscher-Ohlin (H-O) or Heckscher-Ohlin-Wood (H-O-W) models of trade that ascribe trade patterns to be determined by resource or skill-based differences in comparative advantage. Consequently, as argued in the Stolper-Samuelson (SS) theorem, such specialization increases relative prices of goods that use the abundant factor more intensively in production, in turn increasing returns to the abundant factor. In this sense, participation in global export markets impacts quality of employment through its impact on relative prices of goods and labor productivity.

This paper contributes to the empirical literature by testing this linkage using a two-step estimation procedure on a panel of 38 developed and developing economies. In the first step, trade integration measures of overall and GVC trade volume are regressed on product prices and labor productivity. Estimated coefficients are then regressed on employment quality indicators (hourly wages and labor shares in income for three skill types) in the second step. Resulting empirical estimates allows for a critique of the hypothesized trade-wage linkage in comparative advantage trade theories as follows.

Models in the H-O tradition fail to explain an apparent *trade-wage anomaly* in contemporary cross-country data (Kurokawa, 2010; Williamson, 1997). As in this paper's estimates, overall and GVC trade is associated with growing wage inequality in both developed and developing economies. As per H-O-W models, developing nations which specialize in low-skill intensive goods should see an increase in wages of low-skilled labor, but we do not find such evidence. Mainstream attempts to explain this anomaly using change in relative prices seems

inadequate (Timmer et al., 2014). Evidence from empirical literature points to a *price-wage* anomaly – delinking of change in prices from change in wages of the abundant factor – contrary to predictions of the Stolper-Samuelson (SS) theorem (Edwards and Lawrence, 2010). While trade positively impacts relative prices, it does not in turn increase relative wages of low-skilled labor in emerging nations.

This paper argues that instead of relative prices, the trade-wage anomaly is better explained by *skill intensity reversals* (Kurokawa, 2014; Reshef, 2007)[1]. Low-skill intensive tasks that US offshores tend to be high-skill intensive tasks in developing nations, which can explain the increase in relative demand and wages of the same skill type (skilled labor) across geography. Estimates in the paper point to rising skill intensity (or labor shares in income) of high-skilled labor relative to other skill-types in both country groups. It is differences in skill intensities in production across countries rather than exploiting resource or skill-based differences in comparative advantage that better explains the link between trade and growing wage inequality (or deteriorating employment quality). Greater fragmentation of tasks within firms has decreased the amount of core workers in supply chains. In relative terms, benefits have essentially accrued to high-skilled labor as they comprise the group of core workers who perform high-value added tasks (Nadvi, 2004). In this process, less-skilled labor has systematically lost out globally, increasing economic insecurity and vulnerability for labor.

Worsening employment quality is also reflected in adverse changes in the functional distribution of income. Results depict a negative impact of trade on labor shares in income and

[1] Reversal of skill intensities imply that the same commodity is produced using different techniques of production or labor to capital ratios in developed and developing nations. For instance, shoe production tends to be capital intensive in the US but labor intensive in India. In this sense, offshoring of shoe production from US to India will increase demand for capital or high skilled labor in India, thus increasing wage inequality in both countries (Feenstra and Taylor, 2014).

rising relative returns of capital vis-à-vis labor. This evidence can be situated in a large body of political economy literature which attributes such changes to a weakening of relative bargaining power of labor over time (Stockhammer, 2015; Karabarbounis and Neiman, 2014; Onaran, 2011).

In the vein of Knnoringa and Pegler (2006), this work validates that higher paid, higher skilled, and more secure jobs do not merely emanate from supply-chain integration. This has important policy implications in emerging nations as GVC integration could create trade and employment growth in the short term but should not be viewed as a shortcut to achieve inclusive development in the long-run. Rather, as maintained in the development literature, gains from trade integration depend on countries' ability to exercise policy autonomy and manage how they engage with globalization (UNCTAD, 2017; Rodrik, 2009).

Section 1.2 offers a brief yet detailed review of literature. Section 1.3 undertakes the two-stage panel data analysis. This section describes the empirical model, followed by description of data and discussion of results. Section 1.4 offers a concluding discussion.

1.2. Review of Literature: Globalization of Trade, Wage-Inequality and Functional Income Distribution

Globalization of trade since 1980s has had significant effects on quantity and quality of employment in both developed and developing economies. This section summarizes key theoretical and empirical contributions in the mainstream, development, and political economy tradition. Section 1.2.1 describes the link between trade and wage inequality as predicated in comparative advantage-based theories of trade, particularly in H-O and H-O-W models. Section 1.2.2 offers a critique of such approaches as failing to explain an apparent *price-wage* anomaly and *trade-wage* anomaly in contemporary trade data. Based on existing empirical research, it is

argued that the link between trade and wage inequality is mediated through processes of skill-intensity reversals or skill-biased technical change, rather than change in relative prices of goods and services. Finally, section 1.2.3 describes the link between trade and functional distribution of income in the mainstream and political economy traditions.

1.2.1. Trade and Wage Inequality in Comparative Advantage-based Theories of Trade

In the mainstream tradition, the link between trade and wage inequality was first analyzed in the Heckscher-Ohlin (H-O) model and the subsequent Stolper-Samuelson (SS) theorem. H-O model noted that capital rich nations will specialize and export capital intensive goods while labor rich nations will specialize and trade labor intensive goods (based on relative comparative advantage). Because of such specialization, argued the Stolper-Samuelson theorem, relative prices and wages of the factor more intensively used in production will rise. Since then, comparative advantage-based theories of trade fell out of favor as they did not account for skill differences.

Wood (1994) argued that H-O model can explain North South trade once skill content is accounted for. With trade liberalization, relative wages of high-skilled to low-skilled labor will increase in the North. As the North is high-skill abundant and specializes in high-skill intensive goods, relative demand and wages of more skilled labor increases. Conversely, relative demand and wages of low skilled workers increase in the low skill abundant South thus increasing wage inequality across regions. The SS theorem in this context implies that higher relative wages result from higher relative prices of high-skill to low-skill intensive goods. With trade integration, the scarce factor loses out in both North and South. Wood estimates a 22% decrease in low skill labor demand in the US in the 1990s. However, an underlying assumption here is that goods imported from South are non-competing imports (Wolff, 2000).

Specifically, in terms of GVC trade, Timmer et. al. (2014) argues that predictions of the H-O model – countries will perform those tasks in GVCs that are relatively intensive in the relatively abundant factor – may not necessarily hold. What a country specializes in depends on factor intensities of all fragmented tasks, potentially leading to a variety of outcomes. Feenstra and Hanson (1996) in their model of offshoring, elaborate on one such alternative outcome. As low-skilled tasks are offshored, developed nations further specialize and produce high-skilled goods. This increases skill intensity of production in emerging nations and in turn relative return of higher-skilled labor. Grossman and Rossi-Hansberg (2008), using a two-sector H-O model argue that production requires a continuum of tasks and factors, each carried out domestically or abroad, which incurs a task dependent cost. "Reduction in the average costs to offshore tasks performed by a given factor has analogous effects to technical change augmenting that particular factor. Depending on the strength of this so-called productivity effect, various outcomes for factor incomes are possible" (Timmer et al., 2014: p.7).

Acemoglu and Autor (2011) offer a general framework for task-based models in which both domestic and foreign factor incomes are determined by interaction between relative factor prices, elasticity of substitution between factors in each task, and the nature of technical change. Costinot, Vogel, and Wang (2012) introduce worker heterogeneity in such task-based models to argue that trade openness generates different effects on wage inequality than standard H-O models depending on workers position within the chain. With integration, all workers in less developed nations move to earlier stages of production, decreasing wage inequality at the bottom and increasing it at the top of the skill distribution.

1.2.2. Alternate Trade and Inequality Approaches

Several key criticisms of these trade-based approaches have been noted. Firstly, a trade-wage inequality anomaly has been noted as data suggests a positive relation between trade and wage inequality in both developed and developing nations (Williamson, 1997). Secondly, a price-wage anomaly has been noted as data suggests that relative prices of high-skill intensive goods and relative wages of high-skilled labor do not move in the same direction (as predicated in the SS theorem) (Lawrence and Slaughter, 1993). Finally, new trade theories of Krugman (1995) empirically argued that trade's impact on wages is limited due to the small overall volume of trade. Krugman (2008) later argues that with increase in US trade with low income nations and growing production disintegration the small effect can no longer be assumed, though it is hard to prove the actual effect.

Contemporary literature has instead focused on skill-biased technical change explanations for growing wage inequality that fits theory and data better. A prominent explanation in this context is of capital-skill complementarity. Krusell et al. (2000) show that decrease in capital good prices in 1980s led to increase in relative demand for high-skilled labor (being complements to technology) and decrease in low-skilled labor demand (being substitutes). This explains declining high-skill intensive product prices alongside growing wage inequality (between low and high skilled workers). Several works have identified this effect using US and developing country data (Berman et. al., 1998; Krugman and Lawrence, 1993; Katz and Autor, 1999).

Criticisms have pointed to a lack of cross-country association between technical progress and wage inequality, as technology growth does not happen in every country that sees growing wage inequality. More recent works have argued for international technology skill

complementarity. Voigtlander (2011) argues that due to global flow of intermediate inputs, skill upgrading in one sector can create upgrading in several other sectors.

Three more recent developments in the literature are worthy of note. Firstly, the trade-wage anomaly has been addressed with arguments of *skill-intensity reversals*. Rising wage inequality globally can be explained by the same product having opposite skill intensities in home and foreign country. For instance, exports of high-skill intensive goods or tasks from the US, which are relatively low skill intensive in Mexico, will increase high-skilled labor demand in the former and decrease low-skilled labor demand in the latter, and vice versa. Thus, increasing relative demand for high-skilled labor and wage inequality in both countries (Kurokawa, 2010; Reshef, 2007)[2].

Secondly, the *job polarization* literature looks at differences in outcomes within the labor market, particularly in terms of quantity of high, medium and low wage workers. Employment growth is seen as non-monotonic, with growth in high and low wage jobs at the cost of the middle, implying polarization in the labor market (Goldin and Katz, 2007; Autor et al., 2008; Blanchard and Willmann, 2011).

Finally, *within group inequality* has been analyzed by looking at inequality within the top 10% or bottom 80% of the income distribution. Dew-Becker and Gordon (2005) show that mean income growth has been faster than median income growth as majority of these income gains has gone to the top 10%. In other words, while inequality between the top 10% and bottom 90% has increased, so has inequality within the top 10%. Atolia and Kurokawa (2012) argue that technical

[2] To elaborate, "U.S. exports to Mexico of goods that are relatively high-skill intensive compared to other goods in the U.S. but relatively low-skill intensive in Mexico will increase demand for U.S. high-skilled workers but decrease demand for Mexican low-skilled workers. Conversely, U.S. imports from Mexico of goods that are relatively low-skill intensive in the U.S. but relatively high-skill intensive in Mexico will decrease demand for U.S. low-skilled workers but increase demand for Mexican high-skilled workers. Therefore, the relative demand and thus the relative wage of high-skilled to low-skilled workers will increase in both countries" (Kurokawa, 2012, p. 18).

change will increase inequality equally across countries, but inequality within the top 10% may diverge across countries due to differences in trade and integration policy.

1.2.3. Empirical debates on income distribution

Inequality debates have traditionally focused on personal rather than functional income distribution (Autor et al, 1998; Card and Di Nardo, 2002). The impact of external integration on the functional distribution of income (labor and capital shares in aggregate income) also suggests a trend towards a decline in employment quality at the macro level. Global labor shares have decreased since the 1980s in 29 of the 50 largest economies who together account for 2/3 of world GDP in 2014. This downward trend is also evident in 7 out of 10 major industries, with the largest declines in tradable sectors like manufacturing, transport and communication (IMF, 2017). In developed nations, labor shares reached their lowest levels prior to the 2007-08 financial crisis and have not recovered much since while in larger emerging nations this downward trend is evident since 1990s, with the steepest decline in China. Such a global downward trend brings into question the stylized assumption of a constant (exogenously determined) labor share in macroeconomic growth models (IMF, 2007; Kaldor, 1957)[3]. Instead, the importance of growing profit shares or capital incomes and its effect on labor incomes becomes useful to analyze.

Rapid growth in technology, fragmentation of production (outsourcing), structural changes (TFP decline, weak growth, or trade slowdown) and demographic shifts in the global economy have impacted labor shares. One consequence has been that medium-skilled jobs have severely declined as routine tasks become automated with integration (Autor and Dorn, 2013). In emerging

[3] It is important to note that the exogenous determination of labor shares is true in conventional wage share models or in models with a Cobb-Douglas function. In contemporary post-Keynesian research, labor shares are endogenously determined in the long run by factors such as technology, institutions, globalization or policy.

economies, cross-country and cross-industry heterogeneity in labor shares is the largest. Further, labor share decline has been borne by low and medium skilled labor primarily with a drop in their relative wage rates due to skill-biased technical change.

Such technology-based explanations serve the basis for mainstream approaches that see it as a key determinant of income distribution. Firstly, *elasticity of substitution* between labor and capital (with change in relative factor costs) is seen as instrumental in explaining declining labor shares (Arrow, 1961; Stockhammer, 2015). Offshoring of tasks from high to low wage nations may not result in capital being replaced by labor as the elasticity of substitution is greater than one, thereby decreasing labor shares (Karabarbounis and Neiman, 2014). Secondly, skill-biased technical change is seen as a key reason and is measured using ICT capital or services, GDP per capita, or structural change variables as proxies. Finally, in a similar vein, IMF (2007) maintains that technical change has been capital rather than labor augmenting. Wage shares would decrease based on specific assumptions about elasticities of skilled and unskilled labor demand (EC, 2007).

In effect, mainstream studies have identified technological change, global integration and policy and institutional factors affecting labor and product markets (IMF, 2017). Contrary to traditional analysis, recent empirical work has recognized openness as having a negative and significant effect on labor market institutions. Mainstream trade theory argues that the abundant factor – capital in advanced nations and labor in less-developed nations – gains. This result suggests that workers in poorer nations benefit with globalization which is not the case once capital mobility is considered, as evidence shows that workers lose out in both rich and poor nations.

Political economy and development literature have identified alternative mechanisms mediating trade's negative impact on labor shares. Firstly, trade affects income distribution

through changing the bargaining positions of capital and labor instead of relative prices (Onaran, 2011; Rodrik, 1997). Capital being the more mobile factor compared to labor benefits more, and it is redistribution of rents rather than factor cost equalization that changes income distribution. Harrison (2002) finds capital-labor ratio and globalization have positive and negative impacts respectively on income distribution. Decomposing globalization, capital and trade account openness negatively affects wage shares and reduces the bargaining power of labor (ILO, 2011; Jayadev, 2007). Dunhaupt (2016) emphasizes on growth of the financial sector, retained earnings, and financial income (in terms of dividends and interests) of non-financial corporations as key factors explaining the negative impact on labor shares.

Secondly, scholars have identified welfare state retrenchment and reduced bargaining power of labor as key factors (Korpi and Palme, 2003). With a shift towards private provisioning of social services, Kristal (2010) argues that "power resources" theories have focused on relative power position of labor and capital (be it organizational, political or structural). Variables such as union density, unemployment benefits, strikes, and left governments have been identified as positively impacting wage shares (Hancke, 2012; Bengtsson, 2014).

Finally, growth in financial activity and importance of financial institutions is also seen as a crucial factor. More exit options for firms (Krippner, 2005) empowers shareholders and rentiers by allowing them to extract a bigger share of corporate profits in the form of dividends or interest payments, thereby increasing competition and corporate control in capital markets (Stockhammer, 2015, 2004). This has encouraged corporations to adopt a 'downsize and distribute' strategy

(Lazonick and O'Sullivan, 2000)[4]. Moreover, financialization at the household level has negatively impacted working class organization or identity.

1.3. Empirical Estimation: Effect of Trade integration on Quality of Employment

1.3.1. Model

To estimate the theoretical linkage between trade integration and employment quality, this paper follows the approach originally outlined in Leamer (1998) and later applied in Feenstra and Hanson (1999), Edwards and Lawrence (2010) and Stone and Cepeda (2012). At the macro level, real value-added output is traditionally estimated using an '*aggregate production function*' of the following form.

$$Y_m = F_m(L_m, H_m, K_m, 1, \frac{p}{p_m}) \quad (1)$$

Output Y_m includes net exports and is sector specific as the subscript m refers to the manufacturing sector. L_m is unskilled labor, H_m is skilled labor, and K_m is capital. p_m is the price of final goods and p is the price of the imported intermediate inputs. The normalizing factor in the production function is p_m. F_m is assumed to be increasing and concave in (L_m, H_m, K_m) thereby representing an industry wide aggregate production function[5]. Using such a production function for empirical work is problematic as it implicitly assumes fixed levels of labor and capital. Instead,

[4] This empirical literature has measured financialization using variables such as interest rates (Dunhaupt, 2013), interest or dividend payments, union density (Stockhammer, 2004), or capital mobility and capital controls (Jayadev, 2007; Rodrik, 1998; Harrison, 2002).

[5] Under perfect competition, the production function can be used to maximize the value of output from the final good subject to two resource constraints. It is important to note that the levels of labor and capital are assumed to be constant in such frameworks, as can be seen in resource constraint (b).

$F_m\left(L_m, H_m, K_m, 1, \frac{p}{p_m}\right) \equiv \max_{x_i, L_i, H_i, K_i} \; p_m f_m(y_1 - x_1, y_2 - x_2) + p x_1 + x_2)$ subject to

$(a)\ y_i = f_i(L_i, H_i, K_i)$, where i=1, 2 and (b) $L_1 + L_2 = L_m,\ H_1 + H_2 = H_m, K_1 + K_2 = K_m$

levels of labor and capital optimally adjust to changes in factor prices. To reflect this, Feenstra and Hanson (1999) propose a *long-run cost function* to replace the aggregate production function in equation (1).

$$C_m\left(w_m, q_m, r_m, Y_m, \frac{p}{p_m}\right) \equiv \min_{L_m, H_m, K_m} [w_m L_m + q_m H_m + r_m K_m], \text{ subject to (1)}, \qquad (2)$$

This long run cost function reflects that capital adjusts alongside skilled and unskilled labor and factor prices differ across industries (as subscript m indicates). It can be obtained once optimal quantities of labor and capital are chosen[6]. w, q, and r, are returns or payments to the factors of production as w is the wage of unskilled labor, q is the wage of skilled labor, and r is the rental rate of capital.

Minimizing the cost function and totally differentiating the zero profit conditions, we can derive *total factor productivity* (TFP) at the industry level.

$$TFP_m \equiv (\theta_{mL}\hat{w}_m + \theta_{mH}\hat{q}_m + \theta_{mK}\hat{r}_m) - \hat{p}_m \qquad (3)$$

The cost-shares of the three factors of production add to one – $\theta_{mL} + \theta_{mH} + \theta_{mK} = 1$. Productivity in this context means that factor prices (or returns) rise more than product prices. Empirically, Feenstra and Hanson (1999) call this the '*primal*' definition of productivity as it captures productivity as growth in output minus growth in weighted inputs. It is imperative to note that *such TFP equations are essentially accounting identities, which makes the use of production*

[6] Alternatively, the short run cost function can be defined as: $C_m\left(w, q, Y_m, K_m, \frac{p}{p_m}\right) \equiv \min_{L_m, H_m} wL_m + qH_m$, subject to equation (1). Moreover, Feenstra and Hanson argue that if the level of labor and capital are optimally chosen at the industry level as in equation (2), it must also be optimally chosen for each task i. This gives us the long-run cost function for disaggregated tasks within an industry as: $C_i(w, q, r, Y_i) \equiv \min_{L_i, H_i, K_i} wL_i + qH_i + rK_i$, subject to (1).

functions problematic for empirical work (Rada and Taylor, 2006). However, rearranging equation (3) and replacing contemporaneous price changes with discreet price changes ($\Delta ln\, p_m$), the following regression equation can be derived.

$$\Delta lnP_m = -TFP_m + \theta_{mL}\Delta lnw_m + \theta_{mH}\Delta lnq_m + \theta_{mK}\Delta lnr_m \quad (4)$$

In the above equation, P_m is product prices in industry *m*; TFP is total factor productivity as in equation (3); *w*, *q*, and *r* are factor payments or returns to unskilled labor, skilled labor (or human capital), and physical capital; and θ refers to the respective factor cost-shares in total. It shows the relationship between change in product prices given changes in productivity and weighted factor prices. We can now transition equation (4) into one that can be estimated.

$$\Delta lnP_m = -TFP_m + \theta_{mL}\omega_L + \theta_{mH}\omega_H + \theta_{mK}\omega_K + \varepsilon_m \quad (5)$$

Equation (5) is a linear regression where the regression coefficients (ω_L, ω_H, and ω_K) depict implied change in factor payments that are mandated by change in product prices. Comparing equations (4) and (5), Feenstra and Hanson (1999) note that implied changes in factor returns (ω_L, ω_H, and ω_K) differ from actual average changes in factor returns ($\overline{\Delta lnw_m}$, $\overline{\Delta lnq_m}$, and $\overline{\Delta lnr_m}$). So, equation (4) can be rewritten to reflect this change as follows.

$$\Delta lnP_m = -TFP_m + \theta_{mL}\overline{\Delta lnw} + \theta_{mH}\overline{\Delta lnq} + \theta_{mK}\overline{\Delta lnr} + \varepsilon_m \quad (6)$$

The error term (ε_m) in (5) incorporates differences in industry wage changes and average wage changes.

$$\varepsilon_m = \theta_{mL}\left(\overline{\Delta lnw} - \Delta \ln w_m\right) + \theta_{mH}\left(\overline{\Delta lnq} - \Delta \ln q_m\right) + \theta_{mK}\left(\overline{\Delta lnr} - \Delta \ln r_m\right) \quad (7)$$

ε_m reflects *inter-skill wage differentials* – difference between actual wages and average manufacturing wages for each skill-type. Wage differentials vary across sectors, industry, or skill (higher wages in more-skill intensive industries) and tend to remain stable over time. However, estimates of ω in equation (5) will generate biased estimates of average actual wage changes as ε_m is correlated with factor cost shares θ_m. Industries like office equipment that employ more high skilled labor (engineers) will have a higher wage differential which will be correlated with factor share of high-skilled labor. To address this concern, ε_m can be included as a regressor such that it now reflects changes in inter-skill wage differentials. This generates a measure for '*effective'* TFP (or ETFP):

$$ETFP_m = TFP_m - \varepsilon_m = \left(\theta_{mL}\overline{\Delta lnw} + \theta_{mH}\overline{\Delta lnq} + \theta_{mK}\overline{\Delta lnr}\right) - \Delta lnp_m \quad (8)$$

Using (8), equation (5) can now be rewritten without an error term for estimation purposes as follows.

$$\Delta lnP_m = -ETFP_m + \theta_{mL}\omega_L + \theta_{mH}\omega_H + \theta_{mK}\omega_K \quad (9)$$

However, estimating (9) to establish the link between trade and factor returns is problematic for two reasons. Firstly, the absence of an error term in (9) implies that the regression should provide a perfect fit when estimated. In this case the regression does not provide any new information at all, making the approach flawed. Secondly, to isolate the impact of trade on factor returns, we must disentangle the effects of structural variables on prices and productivity. In other words, structural variables like trade or output impacts wages through its impact on prices and productivity. To account for both concerns, a two-step estimation procedure has been employed.

The first step involves regressing structural variables (of trade or output) on the sum of prices and effective TFP. The estimated contribution of structural variables can be then used to construct the dependent variable for the second stage regressions. In the second step, the estimated structural variable from the first stage is regressed on factor cost shares (θ), where the coefficients (ω) can be interpreted as *the portion of the total change in factor prices that is explained by the structural variable* (Z) of trade.

$$\Delta\, lnP_m + (ETFP)_m \;= \alpha_0 + \alpha_1 \Delta\, Z_{1m} \tag{10}$$

$$\widehat{\alpha_1} \Delta Z_{1m} = \omega_{1L}\theta_{mL} + \omega_{1H}\theta_{mH} + \omega_{1K}\theta_{mK} \tag{11}$$

This general empirical framework of Feenstra and Hanson (1999) models the link between outsourcing and factor returns (or payments). It is consistent with 'Specific-factor' models or 'H-O' models that characterize the impact of trade on wages to be mediated through change in relative prices. The panel data regressions in this paper employs the above two-step estimation procedure as follows.

$$\Delta\, lnP_{it} + (effective\ labor\ productivity)_{it} \;= \alpha_0 + \alpha_1 \Delta\, lnZ_{it} + \gamma_t + \tau_i \tag{10a}$$

$$\hat{\alpha}_1 \Delta Z_{it} \;= (\omega_H)_{it}(\mathrm{lnW}_H)_{it} + (\omega_M)_{it}(\mathrm{lnW}_M)_{it} + (\omega_L)_{it}(\mathrm{lnW}_L)_{it} + (\omega_K)_{it}(lnK)_{it} + \gamma_t + \tau_i + \mu_{it} \tag{11a}$$

The estimation is sector specific as both regressions are industry totals estimated for country i at time t. It does not capture within or between industry variation or heterogeneity in the data but only variation across country and time in the industrial sector. γ_t and τ_i are country and year fixed effects while μ_{it} is the error term. Z in the first step (10a) refers to structural variables of trade integration in terms of final goods and intermediate inputs. ETFP is replaced with effective labor productivity as in Ricardian terms, differences in labor productivities are reflective of

differences in technology across countries. Effective labor productivity is estimated using (8) by first estimating the error term in (7) and then deducting it from our measure of labor productivity.

Each independent variable in (11a) represents decomposed factor payments, and together depict total change in factor payments. W_H, W_M and W_L are wages per hour of workers of three different skill types (high, medium, and low skilled) while K refers to capital compensation. *Regression coefficients ω_H, ω_M, ω_L and ω_K can be interpreted as the change in factor prices that would have occurred if change in trade volume is the only source of change in value added prices and productivity.* In other words, it captures *the change in factor prices mandated by changes in the value-added price and productivity due to each structural (trade) variable.*

Finally, to estimate the impact of trade on functional distribution of income, an alternative second step regression is employed.

$$(\ln\hat{\alpha}_1)_{it}\Delta Z_{it} = \beta_{it}(\ln LaborShare)_{it} + \gamma_t + \tau_i + \varepsilon_{it} \quad (12)$$

In (12), estimated trade coefficient from the first stage (10a) is regressed on labor and capital share in income independently. Being consistent with (10a) and (11a), coefficient β_{it} shows the proportion of change in labor or capital shares in income that are induced by trade integration's impact on prices and productivity.

1.3.2. Data

Existing research has focused on trade integration in terms of overall gross trade volume (gross exports and imports in GDP) due to lack of systematic data on trade in intermediate inputs. Moreover, wage inequality by skill type has traditionally been captured by wages and quantity shares of production and non-production workers in developed countries. Though wages of

production and non-production workers can be a useful proxy to get at skilled-biased technical change by separating workers into high and low skilled groups, both these categories can include workers of either skill levels. In developing nations on the other hand, wage data in general (not to mention wages by skill levels) is mostly available at the country level with varying methodologies, which makes cross-country comparative analysis rather difficult. Further, empirical studies fail to explicitly distinguish measures of quantity and quality of employment.

This paper contributes to the empirical literature on trade integration and wage inequality by using new data on value-added trade and wage compensation of high-skill, medium-skill, and low-skill workers.

1.3.2.1. Estimating External Integration

External integration can be captured in terms of trade in final goods or intermediate inputs. OECD-WTO's Trade in value-added (TIVA) database (2016) provides systematic panel data for 62 countries and 34 disaggregated sectors for the years 1995-2011. Overall trade volume (or trade in final goods) is measured using gross exports plus gross imports as a share of GDP (a widely used measure in the empirical trade literature). Being a nominal measure, it captures more of the variation and volatility across country units. Exports and imports constitute final demand measures of trade volume traditionally reported in standard trade statistics.

Measurement of value chains or value-added trade as opposed to overall trade volume and policy (proxied by exports, imports, and tariffs) has been a subject of much debate. Koopman et al. (2010) argue that since official trade statistics are measured in gross terms, they 'double count' the value of intermediate inputs that cross international borders (see Leamer, 2006 for a discussion

on shortcomings of trade statistics)[7]. Case studies on apparel or electronics value chains have shown a difference between gross and value-added exports. The much-cited study of Apple i-pods by Dedrick, Kraemer, and Linden (2008) and Koopman, Wang, and Wei (2008) show that on average over 80% of value-added in Chinese exports (of computers or office equipment) is from foreign countries.

Such patterns are confirmed in several descriptive data analyses using TIVA (2014) data (Banga, 2014; Timmer et al., 2014). Hummels, Ishii, and Yi (2001) provide the first general measures of vertical specialization by quantifying foreign value-added content of a country's exports, though these estimates are not robust if intermediate goods cross borders (as is the case in value chains)[8].

Contemporary GVC estimates have involved decomposing gross exports into their domestic and foreign value-added content (UNCTAD, 2013; Koopman et al. 2010). Foreign value-added (FVA) in exports represent that part of a country's exports that are made with inputs produced in other countries. Domestic value-added (DVA) in foreign exports refers to that generated domestically and used in the exports of other countries. DVA can be expressed as a share of GDP or as a share of global value-added trade. These two measures can be combined together to determine GVC participation – "*share of a country's exports that is part of a multi-stage trade process by adding FVA used in a country's exports with DVA supplied to other countries' exports. GVC participation can be useful in estimating the trade-investment nexus,*

[7] To elaborate, raw material extraction in country A is processed in country B which then enters the manufacturing stage in country C and finally ends up as final demand in country D (new value being added at each stage of production). Standard statistics on trade volume reports value of exports or imports in final demand, which double counts the value-added at each previous intermediate stage of production (UNCTAD, 2013).

[8] Works using the GTAP database have shown that countries and sectors differ in terms of the ratio of value added to gross trade (Daudin, Rifflart, and Schweisguth, 2010; Johnson and Nogeuro, 2010). Global fragmentation of production is also seen to increase trade costs for several countries (Koopman et al., 2010).

being a useful indicator for the extent to which a country's exports are integrated in international production networks" (UNCTAD, 2013: 126). This measure captures upstream and downstream involvement in GVCs, and the extent to which industries rely on internationally integrated production networks[9]. Thus, this paper distinctly identifies GVC trade by estimating it as a sum of forward participation (DVA in foreign exports as share of gross exports) and backward participation (FVA in exports as share of gross exports).

1.3.2.2. Estimating Quality of Employment

This paper contributes to the literature by estimating linkages between GVC trade and quality of employment. A variety of employment quality measures have been estimated to argue that integration may create more jobs in total, though a large proportion of these jobs can be of poor quality. Employment quality is captured with indicators of wage inequality (overall and by skill type) and functional distribution of income.

Socio-economic Accounts of the World Input-Output database (SEA WIOD, 2014) provides unique and systematic data on labor compensation and hours worked by high, medium, and low-skilled labor, for 39 countries across 34 industrial sectors from 1995-2011. Table 1.1 shows the SEA classification of skill type based on educational attainment. It is important to note that SEA data measures total labor compensation, total capital compensation, and value-added in GDP in national currency (millions). To allow for cross-country comparison, these variables are first converted into purchasing power parity (PPP) dollars by deflating each variable with exchange

[9] Data on value added trade by industry can provide useful indications of comparative advantages and competitiveness of countries, and hence form a basis for development strategies and policies (ibid).

rate ratio from the Penn World Tables (PWT 9.0). These PPP adjusted SEA variables are then used to estimate wages per hour by skill type and labor shares in aggregate income by skill type.

Wage per hour, measured in PPP US dollars, is calculated as the ratio of total labor compensation to total hours worked. Total labor compensation for each skill type is calculated as the product of total labor compensation and share of each skill-type in total labor compensation (or wage bill). Hours worked by skill type is calculated as the product of total hours worked and share of each skill-type in total hours. This gives us three distinct measures of wage per hour for high, medium, and low-skilled labor. Hourly wages can be considered a measure of employment quality as it looks at wages earned relative to hours worked. We expect high-skilled labor to receive a higher share of the total wage bill by working lesser hours relative to low-skilled labor.

Labor shares in aggregate income is calculated using total labor compensation as a share of value-added in GDP (both variables being PPP adjusted). Since labor and capital shares add up to one (assuming no dividends or rent payments), capital share has been estimated as a residual. Literature abounds with evidence suggestive of a global decrease in labor shares over time (Stockhammer, 2015; Karabarbounis and Neiman, 2014), which is evident in the sample data (more details in the next section). Existing empirical work has strongly linked trade with labor or capital shares in aggregate income.

This paper extends on past empirical work by linking labor shares in aggregate income by skill-type (instead of overall labor shares) with trade integration. Labor shares by skill type provides unique estimates for *factor* or *skill intensity of production* which is estimated based on the approach outlined in Edwards and Lawrence (2010). The authors describe factor or skill intensity as the factor shares in total costs, which is reflective of how intensively a given factor or

skill-type is used in domestic production[10]. The authors proxy skilled and unskilled labor intensity of production using share of production and non-production workers payments in value-added[11]. In this vein, labor shares (estimated from SEA data) are multiplied with wage share of each skill-type in total labor compensation to generate three unique estimates of skill intensity or labor shares in aggregate income by skill-type.

1.3.2.3. Sample Overview

This paper combines GVC and overall trade measures for 62 countries from the TIVA data with hourly wage and labor share measures for 39 countries from the SEA WIOD data. On this basis, a panel data for 38 countries over 17 years is constructed (see Table 1.11 for a list of all 25 developed and 13 developing countries in the sample) [12]. This paper aggregates data at the level of industry totals instead of using an industry-wide panel. A brief description of data trends pertaining to trade and employment quality measures in the sample are as follows.

Figure 1.1 shows that the mean volume of gross trade is greater than the mean volume of value-added trade within each sample country. Across developed and developing countries however, mean levels of both trade measures are higher in the former. In the same vein as Timmer et. al (2013) and Banga (2014), this implies that though emerging countries like China or India

[10] Considering two factors: skilled (s) and unskilled labor (u), and two goods: a skilled labor–intensive good x and an unskilled labor–intensive good y, there is a one-to-one relationship between the relative prices of the goods and the relative wages of skilled (Ws) and unskilled (Wu) workers. Using a * to indicate proportional rates of change, and Sx and Sy to denote the shares of skilled labor in the production cost of x and y respectively then:
$Px^* - Py^* = (Sx - Sy)(Ws^* - Wu^*)$. This can also be used to show the impact of productivity changes on factor prices, assuming given prices. In this case, an increase in productivity in an industry raises the relative return to the factor used relatively intensively. (Edwards and Lawrence, 2010, p.3).

[11] Skilled and unskilled labor intensity of production (or cost share) can be estimated as – (sprod*Lshare)t , where sprod is average share of production workers remuneration in total wage bill. Non-production worker cost share on the other hand is calculated as (1-sprod)*Lsharet. (Edwards and Lawrence, 2010, p.47).

[12] Malta has been dropped from the sample to give us a total of 38 instead of 39 countries. Malta does not have data on value-added per worker for the sample period which is required to estimate the labor productivity measure for the first step regression.

may be integrated massively in gross export and import terms, they are much less integrated in value-added terms relative to developed countries (being integrated in relatively lower nodes of GVCs). Lower levels of domestic value-added (DVA) in emerging nations is indicative of constraints in enhancing forward participation in GVCs and competitive potential of domestic exporting industries.

In Figure 1.2, total hourly wages on average are higher for developed economies compared to developing ones. Moreover, mean hourly wages of high-skilled labor is greater than that of medium and low-skilled labor in the sample. This aligns with Ricardian arguments of wage determination being driven by absolute advantage as differences in technology allows for higher pre-trade relative wages in developed nations (Feenstra and Taylor, 2014).

Regarding trends in income distribution, Figure 1.3 shows that from 1995-2011, though average labor shares in income (0.59) were greater than capital shares (0.41), the declining labor share trend is evident over time for most nations. Except for Italy and Sweden, a steady decline (rise) in labor shares (capital shares) can be seen for all developed nations in the sample. The declining trend is evident but much more volatile in developing nations. In emerging markets of China and India, capital shares have exceeded labor shares since mid-2000s, while in Mexico and Turkey this trend has been evident for the entire sample period.

Finally, as seen in the table of summary statistics, mean level of high-skilled labor share (or skill-intensity) is higher than medium and low-skilled labor share within and across all sample countries. However, the gap between skill intensity of high and low-skilled labor on average is much larger in developed countries compared to developing ones. It suggests that relative demand for high-skilled labor in production tends to be larger in developed nations.

1.3.3. Discussion of Results: Trade Globalization and Deteriorating Employment Quality

Based on empirical estimates (listed in tables and figures), this paper argues that overall and GVC trade is negatively associated with quality of employment in the industrial sector of both advanced and emerging economies. Trade integration is associated with *(a) growing wage inequality between more-skilled and less skilled labor; (b) a decrease in hourly wages of low-skilled workers relative to high-skilled; (c) falling labor share in aggregate income and in turn rising profit shares; and (d) a decrease in the relative skill-intensity of low and medium-skilled labor in production.* This section embeds these empirical results in contemporary non-comparative advantage-based trade theories and the political economy of development tradition.

1.3.3.1. Trade and Wage Inequality by Skill-type

As noted in the review of literature, mainstream studies have been confounded with global data not conforming with theoretical predictions of H-O model and the SS theorem. Across all versions of resource or skill-based H-O models, it is either capital or high-skilled labor that benefits in advanced nations (being capital or high-skilled labor rich) and labor or low-skilled labor that benefits in developing nations (being labor or low-skilled labor rich). Despite these contradictions, these models have led to popular conceptions within policy circles that though trade creates winners and losers domestically, both rich and poor nations benefit from unregulated trade due to their differing comparative advantage in terms of resources or skills. Such perceived positive effects of globalization on labor returns does not seem to be validated in contemporary empirical works using new trade and wage data, as is confirmed in this paper's estimates for the 38 sample countries. Results show that in fact employment quality (in terms of hourly wages and labor shares

by skill-type) has been worsening with greater external integration globally, more so for developing countries in their post liberalization era.

The two-step estimation procedure involves regressing overall and GVC trade on gross and value-added prices and labor productivity in the first step. In the second step, various employment quality indicators are regressed on estimated trade measures from the first step. Table 1.2 reports first stage results while tables 1.3 through 1.9 report second-stage regression results.

1.3.3.1.1. Price-Wage Anomaly

In the first step (Table 1.2), both overall and GVC trade positively affects the sum of prices and labor productivity in both developed and developing country samples. The coefficients (measured as elasticities) are statistically as well as economically significant – ranging between 1.4% to 4%. In developing countries, a 1% increase in GVC trade increases value-added prices and labor productivity by 3.98% on average, while overall trade increases gross-output prices and labor productivity by 1.60%. Results depict that trade is associated with higher external competitiveness in terms of higher product prices and labor productivity, as predicated in comparative advantage-based trade models.

However, the link between product prices and factor prices (or payments) is important to establish empirically in this context. In their original paper Feenstra and Hanson (1999) estimate equation (4) by regressing factor payments of production and non-production workers on import prices. The authors do not find evidence rejecting the price-wage anomaly, with estimates being positive but statistically insignificant in the range of 1-5%. Given the statistical issues involved in estimating (4) (as explained in section 1.3.1), this linkage is not directly tested in this paper and instead the two-step estimation is undertaken.

Later works testing this linkage have used a range of structural variables (such as output, exports, imports, or tariffs) as regressors in the first stage. Stone and Cepeda (2012) regress import volume on prices and effective TFP in the first stage and find (insignificant) coefficients in the range of 0.005% to 0.133% across specifications. Edwards and Lawrence (2010) check the Stolper-Samuelson effect in the sense that relative prices and wages of the abundant factor should increase when US trades with developing nations. They find evidence contrary to predictions of the SS theorem. Their estimates show that relative effective prices of unskilled labor in the US has increased since 1990s (instead of decreasing) and in turn have not mandated changes in relative wages. Moreover, they argue that higher import prices have not been the reason contributing to higher wage inequality in the US. All this evidence validates the presence of a *price-wage* anomaly in contemporary data.

1.3.3.1.2. Trade-Wage Anomaly

The relationship between changes in factor payments by skill-level and trade integration (induced by changes in product prices and productivity) has been captured in the second stage estimates. Table 1.3 lists estimates for hourly wages by skill type – first key indicator pertaining to employment quality. Capital compensation is used as a control variable to proxy for capital returns in the model. The theoretical and empirical framework used allows for multicollinearity between all three skill types (being decomposed variables for total labor payments) that results from having all three as regressors. Despite this, in the rest of the analysis only medium skilled and low skilled variables have been reported which implies that these coefficients are read as changes relative to high-skilled labor. The coefficients of these regressions are interpreted as *predicted factor-price changes due to the price and productivity impact of each structural trade variable*.

For developed nations in the sample, a 1.04% decrease in low-skilled wages per hour can be attributed to GVC trade's positive effect on prices and productivity. For developing nations on the other hand, a 4.89% and 4.14% decrease in medium-skilled wages per hour can be attributed to GVC and overall trade integration's positive price and productivity effect respectively. The negative sign is also evident for low-skilled hourly wages, though not statistically significant. The results imply a significant negative relationship between trade integration and hourly wages of less skilled labor (relative to high skilled labor) in both country samples.

Krugman's (2008) claim of the wage inequality effect being limited and difficult to pick up on account of low overall volume of trade between developed and developing nations does not seem to be valid anymore. In other words, relative wage inequality between more and less skilled labor grows with greater external integration, contrary to predictions of the H-O model. Capital compensation on the other hand, is positively correlated with both measures of trade, though estimates are significant only for developed countries. This together implies that capital and high-skilled labor see greater returns from external integration compared to less skilled labor in both country groups.

These estimates are robust to changes in model specification. Econometric theory suggests that standard errors should be bootstrapped when dependent variables are constructed regressors, as in the second stage specification (DiCiccio and Efron, 1996)[13]. The specification in table 1.3 is rerun by replacing heteroskedasticity robust standards errors with bootstrap standard errors (as in table 1.8). Though capital compensation is no longer statistically significant, magnitude and

[13] DiCiccio T. J. and Efron B. (1996): Bootstrap Confidence Intervals (with Discussion). *Statistical Science* 11: 189-228.

significance on hourly wages of medium and low-skilled labor remains identical to estimates in table 1.3.

The above evidence points to the existence of a *trade-wage* anomaly as noted in Kurokawa (2014) and Williamson (1997), depicted by the positive correlation between trade and wage inequality by skill type across geography. Results do not find evidence supporting the mainstream claim that trade is associated with rising wage inequality in developed countries and falling wage inequality in developing ones. Feenstra and Hanson (1999) have shown that offshoring from US led to 15-24% increase in relative wages of non-production (or more skilled) workers during the 1990s. This trend remains evident in contemporary trade data (Stone and Cepeda, 2012). Generally, comparative advantage-based H-O theories in the mainstream tradition are ineffective in explaining why relative demands and wages of high skilled labor increase simultaneously in rich and poor nations (as seen in the data).

1.3.3.1.3. Skill Intensity Reversals

Feenstra and Hanson (1999) provide one alternate explanation to H-O theories. Offshoring of low-skilled tasks leads developed nations to further specialize and produce high-skilled goods, which increases the skill intensity of production in emerging nations and the relative return of higher-skilled labor. This led to arguments of factor or skill-intensity reversals to address the trade wage anomaly. US offshoring of low-skill intensive tasks to developing countries which are relatively high skill intensive tasks in the latter, increases relative demand for skilled labor and wage inequality in both countries (Feenstra and Taylor, 2014; Kurokawa, 2014, Reshef, 2007).

Table 1.4 provides explicit estimates for changes in skill (or factor) intensity of labor in production. High, medium, or low-skilled labor's intensity in production has been measured using

labor share by skill-type (as noted in section 1.3.2.2). For instance, an increase in low-skill labor share in value-added (in GDP) would imply that the proportion of the total labor share attributable to less-skilled labor has increased, which is suggestive of this skill types growing importance in domestic production. Estimates show a systematic decrease in low and medium skilled labor's skill intensity in both sets of countries for both integration measures. For developed countries in the sample, a 2.52% and 1.76% decrease in low skilled labor's skill intensity can be attributed to changes in GVC and overall trade respectively.

For purposes of robustness, the specification in table 1.4 is rerun with bootstrapped standard errors instead of clustering at the country level (see table 1.9). Regression is robust to changes in error specification as developed country coefficients are identical (in terms of size and significance) to those in table 1.4. Moreover, significant estimates are also evident for developing nations in the sample as a 2.1% decrease in low skilled labor's intensity can be attributed to overall trade's positive impact on prices and productivity.

Both advanced and emerging nations are shifting production towards high-skill intensive goods thereby increasing the relative importance of high-skilled labor in domestic industries. This affirms with insights put forth in the literature on skill intensity reversals. Trade wage anomaly is better explained by the mechanism of skill intensity reversals (differences in skill intensities in production between nations for the same product) rather than changes in relative prices.

Empirical estimates listed above do not find evidence in support of predictions of comparative advantage models. Existing literature has proposed for H-O-W model's inadequacy on three grounds. Firstly, developing nations have not specialized in low-skill intensive tasks (but high-skill intensive tasks). Secondly, skill intensity reversals can explain trade-wage anomaly, and

finally, developed and developing nations produce entirely different baskets of goods (Edwards and Lawrence, 2010; Kurokawa, 2014). Though Edwards and Lawrence (2010) find strong evidence for the third explanation, this paper does not explicitly test this linkage and finds stronger evidence for the second explanation. Compared to high-skilled labor, in both country groups low-skilled labor is less intensively used in industrial production and sees relatively lower hourly wage gains. It indicates a *growing demand for more skilled labor in production but does not imply more quantity of high than low skilled labor in the domestic economy*.

Timmer et. al. (2014) uses TIVA and SEA indicators to show that countries don't generally specialize in those tasks in GVCs which use the abundant factor more intensively in production as such specialization depends on factor intensities of all fragmented tasks, thus contradicting predictions of the H-O model. This could alternatively be explained by *skill-biased technical change* – technology is increasingly replacing medium and low skilled tasks (irrespective of a firm's position within the chain) – though this linkage has not been explicitly tested here.

1.3.3.2. Trade and Income Distribution

Adverse changes in functional income distribution can also indicate worsening employment quality. Tables 1.6 and 1.7 test the association between the functional distribution of income and trade integration using equation 12. These specifications depict a negative (positive) correlation between trade volume and labor (capital) shares in aggregate income, affirming with estimates in past empirical research. Coefficients are both statistically and economically significant at 1% significance level. A 4.14% and 4.69% decrease in labor shares can be attributed to changes in GVC trade in developed and developing nations respectively. Similarly, a 3.22% and 8.08% decrease in labor shares can be attributed to overall trade's positive impact on prices and

productivity in the same country groups. Conversely, the positive correlation between capital shares and trade is evident in both country samples in Table 1.7. Coefficients are statistically significant though the magnitudes are larger for developing countries compared to developed ones.

Results affirm with a large body of contemporary empirical literature on the subject. Doan and Wan (2017) find a negative effect of exports on labor shares in the range of 0.167% to 0.37% (across country samples and specifications). Estimates also align with Stockhammer (2015) who picks up larger (negative) size effects for openness in the range of 3-5% (as in this paper), though Stockhammer uses adjusted private wage share instead of overall labor share as the dependent variable. Since majority of past research has linked labor shares with overall trade, this paper contributes by providing robust and significant estimates for GVC trade.

Mainstream studies have focused on elasticity of substitution and skill-biased technical change to argue that trade has been capital rather than labor augmenting. In the development and political economy tradition, decrease in bargaining power of labor relative to capital is a prominent explanation for globalization's negative impact on labor shares. To shed light on this, it is useful to estimate trends in relative capital to labor returns (particularly by skill-type).

Using equation 11a, table 1.5 captures the relation between capital shares relative to high and low-skilled labor shares on one hand, and integration measures on the other. Both in developed and developing nations, overall and GVC trade has contributed to an increase in capital returns relative to labor (irrespective of skill type). In developed nations, a 2.19% and 1.30% increase in capital shares (or returns) relative to low-skilled labor shares can be attributed to GVC and overall trade respectively. Higher capital returns relative to low-skilled labor can be a consequence of declining skill intensity of the latter in industrial production. However, capital's growing return

relative to high-skilled labor is more concerning, given rising skill intensity of high-skilled labor in vertically-specialized production regimes.

Thus, evidence suggests that labor shares in aggregate income have decreased with trade while capital returns relative to labor have increased (though absolute levels of capital and labor returns may have increased within countries). There seems to be widespread consensus in the empirical literature that external integration has negatively impacted labor's share in the functional distribution of income (IMF, 2017; Stockhammer, 2015). As Onaran (2011) emphasizes, the channel might have to do with bargaining power of labor and capital rather than change in relative prices (as in the mainstream view). Rising capital mobility across geography since 1980s has boosted capital returns much more than that of labor (relatively less mobile). In a similar vein, this paper finds evidence of changes in income distribution to be the mediating channel linking trade and wage inequality.

Contrary to new trade theory predictions, it is not factor cost equalization but redistribution of rents that explains changes in income distribution (ILO, 2011; Rodrik, 1997). In fact, rapid growth and spread of global finance is perhaps the most pertinent explanation. Studies have shown that financialization (Dunhaupt, 2016) and capital account openness (Jayadev, 2007) are stronger drivers of falling labor shares than current account restrictions, signifying the importance of analyzing the link between global trade, finance and income distribution in an integrated empirical framework. Of course, such an analysis is beyond the scope of this paper and remains a fertile area for future research.

1.4. Concluding discussion

This paper elucidates the implications of trade globalization in terms of labor market outcomes in advanced and emerging nations. It contributes to the trade and wage inequality literature as follows. Systematic evidence of overall and GVC trade on deteriorating quality of employment allows for a critique of new trade theories as failing to explain the trade-wage anomaly. Instead, this paper presents evidence of skill intensity reversals as the mechanism explaining the anomaly rather than change in relative prices.

Contemporary trade policy and GVC studies view external integration as a shortcut to achieving export-led growth for developing nations. External integration is also seen to be positively associated with firm upgrading and in turn high-road models of labor relations. Dependency theories maintain that development and underdevelopment are part of a single, unified global process of capitalist accumulation; and as poorer nations integrate into globalized capitalism their domestic development is channeled in unpredictable ways (Frank, 1969). However, this does not imply that the type of underdevelopment will be uniform across developing regions, as outcomes will vary based on how global capital interacts with local conditions of production and work in different contexts.

Empirical estimates in this paper show that external integration does not enhance employment quality, particularly in emerging nations. Evidence points to growing wage inequality between skills, rising relative skill intensity of high-skilled labor in production, and higher relative returns to capital. Integration increases competitive pressures for the average firm in developing nations, limiting their scope for undertaking innovation and upgrading to high-value added tasks, in turn resorting to cost cutting labor market strategies. In this sense, firm upgrading is associated

with high road models for the more skilled sections of the workforce, as they perform high-value added tasks for firms.

Across geography, low-skilled labor seems to have lost out systematically with globalization. Trade globalization benefits (costs) the same group of winners (losers) in developed and developing countries. Kaplinsky's (1998) argument of "*immeserizing growth*" in the context of external integration remains relevant. Economic globalization causes growth in trade volume and employment which increases competitive pressures thereby negatively impacting standards of livelihoods and employment quality.

This reinforces the critique that underdevelopment is not due to internal failures such as resource misallocation, corruption, or capital shortage. Suppliers in emerging nations face limited capabilities for upgrading, limited inter-firm bargaining power, and limited premium on investment. Firms face the constant threat of being squeezed out of the market and conditions of work and labor deteriorate. Moreover, new entrants in GVCs perform "rent-poor" tasks as gains from exploiting specific comparative advantages have become elusive or transitory over time. GVC integration should not be viewed as a shortcut to achieve inclusive development in the long run, as gains from such integration may remain concentrated in specific domestic industries and sections of the workforce.

Globalization has increased economic insecurity and vulnerability for labor on average in both advanced and emerging economies. Ability of displaced workers to find alternate employments with same pay is rather limited (Milberg and Winkler, 2013). In emerging nations, rising volume of informal workers or informal employment contracts has been indicative of this

process. NCEUS (2007)[14] noted in the context of India that informal labor accounts for 92% of total workforce and are highly congruent with 77% of the population that are classified as poor and vulnerable (population with a per-capita daily consumption up to Rs.20 in 2004-05). The report emphasizes that higher employment growth from 1999 to 2005 created additional employment that was entirely informal, irrespective of whether it was in the formal (organized) or informal (unorganized) sector. This reasserts the focus of this paper on employment quality rather than employment quantity, as higher-paid, higher-skilled, and more secure jobs do not simply emanate from external integration.

[14] National Commission for Enterprises in the Unorganized sector, Government of India, 2007.

1.5. Figures and Tables

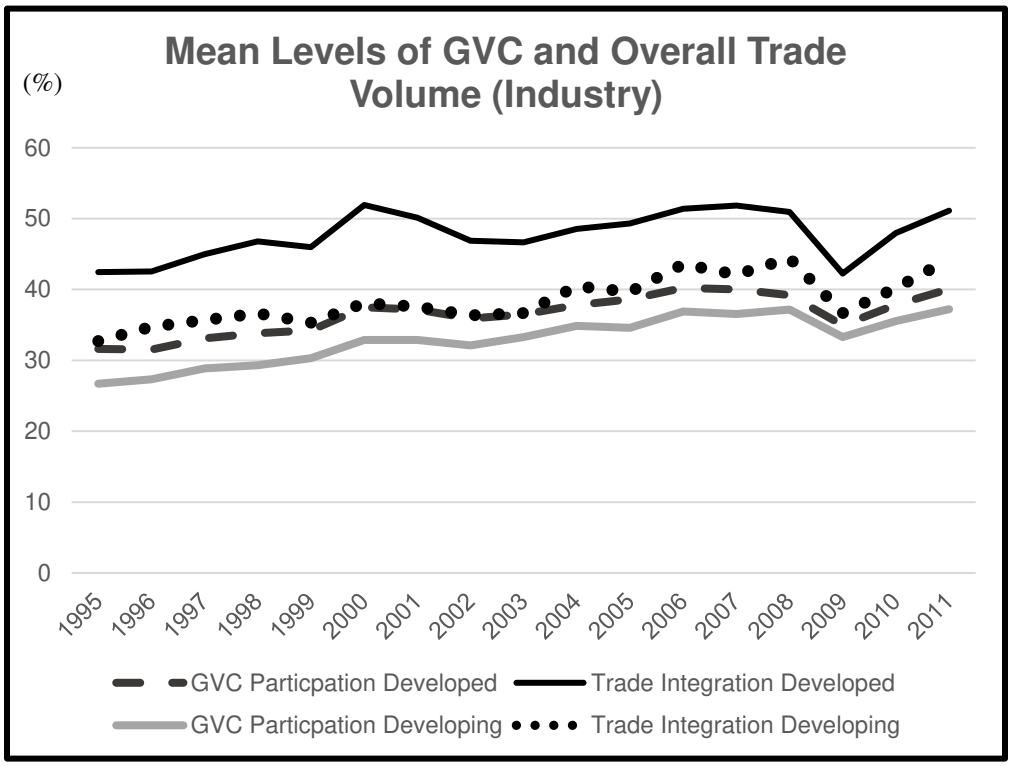


Figure 1.1. Difference in Overall and GVC trade volume by Country group
Source: Authors calculations using TIVA (2014) data. Both overall and GVC trade measures are expressed as a percentage.

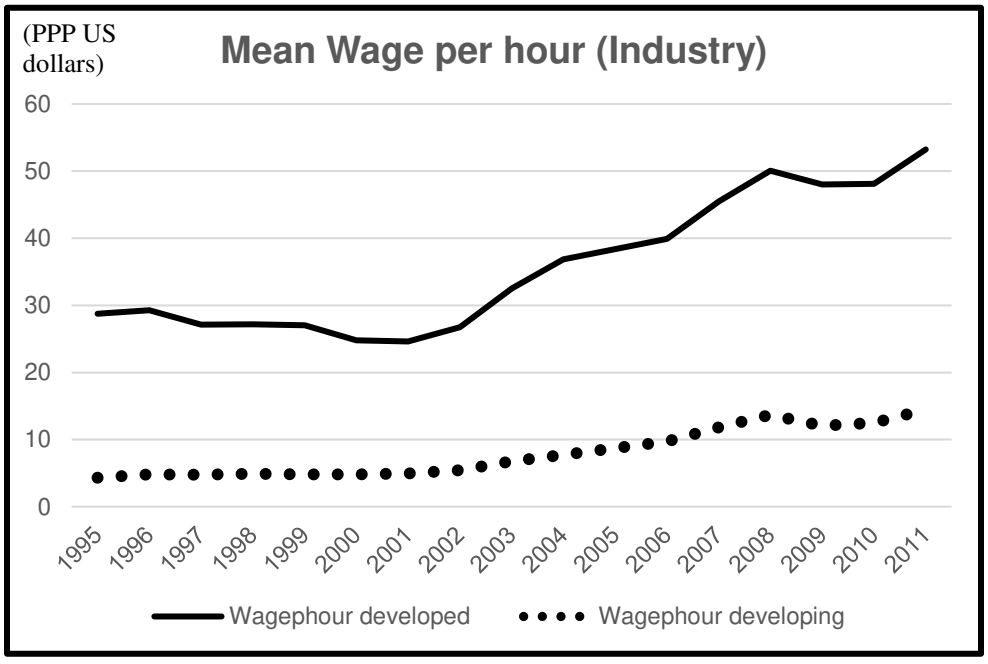


Figure 1.2. Mean levels of Wage per hour: Developed and Developing countries
Source: Authors calculations using SEA WIOD data. Hourly Wages are measured in PPP US dollars.

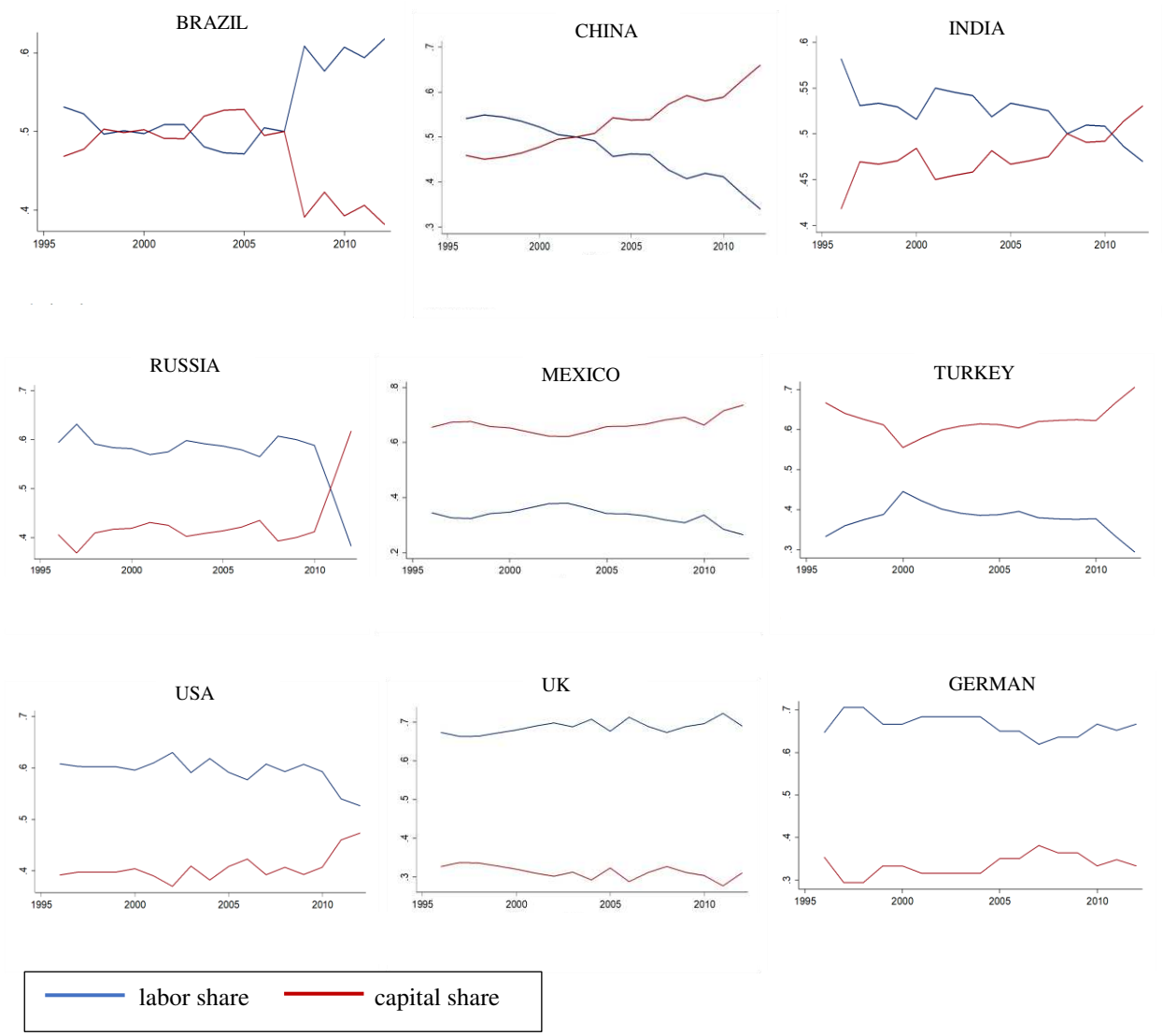


Figure 1.3. Labor and Capital shares – Key Sample countries
Source: Authors calculations using SEA WIOD data

Table 1.1. Definition of skills in WIOD SEA

WIOD skill-type	**1997 ISCED level**	**1997 ISCED level description**
Low	1	Primary education or first stage of basic education
Low	2	Lower secondary or second stage of basic education
Medium	3	(Upper) secondary education
Medium	4	Post-secondary non-tertiary education
High	5	First stage of tertiary education
High	6	Second stage of tertiary education

Source: SEA WIOD (2014)

Table 1.2. First Stage Results: Trade, Prices, and Productivity

Dependent variable:	VA prices + VA per worker		Gross-output prices + VA per worker	
	Developed	Developing	Developed	Developing
GVC Participation L1.	1.43**	3.98***		
	(0.63)	(0.54)		
Trade Integration L1.			0.66	1.60***
			(0.52)	(0.42)
R2	0.15	0.36	0.05	0.10
F	5.11	54.39	1.58	14.13
N	400	208	400	208
Groups	25	13	25	13

Notes: All variables are logged, and year fixed effects have been used. S.E.s are robust to clustering at country level. Regressions have been regressed with a constant term, though not reported. Dependent variables are 1 year lagged which generates a panel over 16 years Malta has been dropped from the sample due to unavailability of labor productivity data.

Table 1.3. Wages per hour by Skill Type and Trade Integration (Industry)

Dependent variable: (estimated)	GVC Participation		Trade Integration	
	Developed	Developing	Developed	Developing
Wage per hour MS L1.	0.11	-4.89**	-0.43	-4.14***
	(0.67)	(2.03)	(0.29)	(1.14)
Wage per hour LS L1.	-1.04*	-1.87	-0.52	-1.40
	(0.51)	(1.33)	(0.45)	(1.21)
Capital compensation L1.	0.51***	0.49	0.34***	2.03
	(0.09)	(2.47)	(0.06)	(1.68)
R2	0.32	0.48	0.18	0.32
F	49.44	4.71	45.64	4.07
N	400	208	400	208

Notes: Low-skilled (LS) wage per hour is calculated as total labor compensation of low-skilled labor divided by total hours worked by LS labor. Total labor compensation of LS labor is calculated as total labor compensation times LS labor's share in total labor compensation. Total hours worked is measured as total hours times share of LS labor in total hours worked. Similarly wages per hour of MS and HS labor has been estimated. All variables are logged and lagged 1 year, year fixed effects have been used, and SE's are robust to heteroskedasticity at the country level.

Table 1.4. Skill-Intensity of Production (or Labor share by skill-type) and Trade Integration (Industry)

Dependent variable: (estimated)	GVC Participation		Trade Integration	
	Developed	Developing	Developed	Developing
Labor share MS L1.	0.13	-1.20	-0.49	-1.44
	(0.70)	(1.36)	(0.48)	(0.86)
Labor share LS L1.	-2.52***	3.84	-1.76***	-2.14
	(0.56)	(3.38)	(0.37)	(1.33)
Capital Compensation L1.	0.28*	-3.35	0.11	-1.05
	(0.16)	(1.57)	(0.13)	(1.28)
R2	0.35	0.46	0.23	0.23
F	65.40	5.10	13.25	3.01
N	400	208	400	208

Notes: HS, MS and LS labor's Skill-intensity in production is captured using labor share in aggregate income by skill type. It is calculated as the ratio of total labor compensation (or wage payments) and value-added in GDP. Both these variables are measured in national currency units in the SEA data, so variables have been first converted to PPP dollars using exchange rate ratio data from PWT 9.0. Labor shares by skill type can be then calculated by multiplying this PPP adjusted labor share with the share of each skill type in the total wage bill (or labor compensation). Independent variables are 1-year lagged, all variables are logged, and year fixed effects have been used. S.E.s are robust to clustering at country level and to bootstrapping (see Table 9). Coefficients are slope differentials of low and medium skilled workers relative to high-skilled and it shows that relative to high-skilled labor, low and medium skilled labor is less intensively used in production.

Table 1.5. Relative Capital to Skill-specific Labor Return and Trade Integration (Industry)

Dependent variable: (estimated)	GVC Participation		Trade Integration	
	Developed	Developing	Developed	Developing
Capital to HS Labor Return	-1.84	4.84*	-0.53	-0.30
L1.	(1.06)	(2.27)	(0.91)	(2.32)
Capital to LS Labor Return	2.19***	-3.96	1.30**	2.30
L1.	(0.58)	(3.51)	(0.48)	(1.43)
R2	0.35	0.44	0.21	0.22
F	33.46	8.48	14.36	3.02
N	400	208	400	208

Notes: Capital to HS Labor return is calculated using the ratio of capital share to high-skilled labor share in income. Similarly, capital to labor return for the other two skill types has been calculated. Independent variables are 1-year lagged, all variables are logged, and year fixed effects have been used. S.E.s are robust to clustering at country level.

Table 1.6. Labor Shares in Aggregate Income and Trade Integration (Industry)

Dependent variable: (estimated)	GVC Participation		Trade Integration	
	Developed	Developing	Developed	Developing
Labor Share L1.	-4.14***	-4.69	-3.22***	-8.08***
	(1.16)	(5.65)	(0.69)	(2.38)
R2	0.31	0.41	0.18	0.25
F	22.32	8.67	18.33	7.85
N	400	208	400	208

Notes: Labor shares are 1-year lagged. All variables are logged, and year fixed effects have been used. S.E.s are robust to clustering at country level and to bootstrapping.

Table 1.7. Capital Shares in Aggregate Income and Trade Integration (Industry)

Dependent variable: (estimated)	GVC Participation		Trade Integration	
	Developed	Developing	Developed	Developing
Capital Share L1.	0.53***	5.29	0.41***	6.03***
	(0.11)	(3.58)	(0.07)	(1.86)
R2	0.29	0.41	0.14	0.25
F	45.46	12.76	44.85	8.73
N	400	208	400	208

Notes: Capital shares are 1-year lagged. All variables are logged, and year fixed effects have been used. S.E.s are robust to clustering at country level and to bootstrapping.

Table 1.8. Robustness Check #1: Wage per hour ratio and Trade Integration with Bootstrap S.E's

Dependent variable: (estimated)	GVC Participation		Trade Integration	
	Developed	Developing	Developed	Developing
Wage per hour MS L1.	0.11	-4.89**	-0.43	-4.14***
	(0.78)	(2.41)	(0.29)	(1.22)
Wage per hour LS L1.	-1.04**	-1.87	-0.52	-1.40
	(0.51)	(1.52)	(0.42)	(1.29)
Capital compensation L1.	0.51	0.49	0.34	2.03
	(0.74)	(2.79)	(0.31)	(1.99)
R2	0.32	0.48	0.18	0.32
Wald Chi2	27.43	15.35	8.82	16.43
N	400	208	400	208

Notes: The dependent variable being a constructed regressor, as per econometric theory, standard errors should be bootstrapped rather than simply controlling for heteroskedasticity. This specification offers a robustness check to show that key results for skill intensity of production remain valid under alternative standard error specification. This table runs the same specification as in Table 3 with bootstrap S.E.'s. Coefficient signs and magnitudes are identical to estimates in Table 3.

Table 1.9. Robustness Check #2: Skill intensity of production and trade integration with Bootstrap standard errors

Dependent variable: (estimated)	GVC Participation		Trade Integration	
	Developed	Developing	Developed	Developing
Labor Share MS L1.	0.13	-1.20	-0.49	-1.44
	(0.68)	(2.01)	(0.47)	(1.20)
Labor Share LS L1.	-2.52***	3.84	-1.76***	-2.14*
	(0.69)	(3.55)	(0.32)	(1.29)
Capital Compensation L1.	0.28	-3.35	0.11	-1.05
	(0.26)	(1.78)	(0.25)	(1.21)
R2	0.35	0.46	0.23	0.23
Wald Chi2	99.63	18.90	37.18	11.81
N	400	208	400	208

Notes: The dependent variable being a constructed regressor, as per econometric theory, standard errors should be bootstrapped rather than simply controlling for heteroskedasticity. This specification offers a robustness check to show that key results for skill intensity of production remain valid under alternative standard error specification. This table runs the same specification as in Table 4 with bootstrap S.E.'s. Coefficient signs and magnitudes are identical to estimates in Table 4.

Table 1.10. Summary Statistics

Variable	***Mean***	***Std. Dev.***	***Min***	***Max***
Value Added in GDP (PPP US dollars) (Industry)	938350	2026504	3063.57	1.50e+07
High-skill labor share in total compensation (Industry)	0.41	0.16	0.04	0.75
Medium-skill labor share in total compensation (Industry)	0.27	0.21	0.01	0.82
Low-skill labor share in total compensation (Industry)	0.22	0.11	0.03	0.62
Total Labor compensation high-skilled (Industry) PPP dollars	225161.4	542770.9	621.02	3825000
Total Labor compensation medium-skilled (Industry) PPP dollars	127156.8	256345.8	151.20	1849891
Total Labor compensation low-skilled (Industry) PPP dollars	142737.9	372535.7	399.23	3081000
Total Labor compensation (Industry) PPP dollars	548175.7	1177117	1709.48	8500000
Total Capital Compensation (PPP US dollars)	379582.4	831076.5	220.41	5800000
Export plus import (share of GDP) (Industry)	45.60	20.21	9.48	109.00
GVC participation (Industry)	35.27	9.49	11.59	61.91
Gross-output prices (index) (Industry)	349.36	781.01	86.24	5781.8
Intermediate-input prices (index) (Industry)	330.78	731.94	88.51	5781.8
VA price (index) (Industry)	369.75	852.28	86.51	5781.8
Total Employment (Industry)	55708.21	134877.4	347.66	808565
Hours worked High-skilled (Industry)	10921.17	19598.95	70.92	108000
Hours medium-skilled (Industry)	36940.18	83032.46	111.25	558000
Hours low-skilled (Industry)	53683.74	179589.3	57.34	1080000
Industry VAPW (real)	56421.01	42583.93	3472.93	226980.9

Labor Share in Income	0.59	0.10	0.26	1.00
Capital Share in Income	0.41	0.10	0.05	0.74
High skilled labor share (%)	24.50	11.00	2.16	70.00
Medium skilled labor share (%)	15.62	11.35	0.46	58.90
Low skilled labor share (%)	13.40	7.31	1.53	35.70
Wage per hour (PPP US dollars)	26.28	21.95	0.21	92.06
Wage per hour High-Skilled (PPP US dollars)	52.74	49.39	0.52	255.06
Wage per hour Medium-Skilled (PPP US dollars)	15.72	19.17	0.17	99.41
Wage per hour Low-Skilled (PPP US dollars)	39.37	54.61	0.02	431.85
Exchange Rate	253.18	1364.67	0.05	10389.94
N (observations) = 646				
Time = 17				
Country = 38				

Table 1.11. List of Sample Countries

EU	**New EU members**	**Other Countries**	**G7**	**Asia**	**Latin America**
Austria Belgium Denmark Finland France Germany Greece Ireland Italy Luxembourg Netherlands Portugal Spain Sweden United Kingdom	Bulgaria Cyprus Czech Republic Estonia Hungary Latvia Lithuania Malta Poland Romania Slovakia Slovenia	Australia Canada Japan United States	Canada Japan France Germany Italy United Kingdom United States	China Indonesia Republic of Korea India Turkey Russia	Brazil Mexico

Source: 39 countries in SEA (2014) are organized as per WESP, UN classification of countries. Number of developing nations limited by availability of wage data.

Table 1.12. List of Industries and Service Sectors

Aggregate 18 Industry List	**ICIO 34 Industry list**
Agriculture, hunting, forestry and fishing	Agriculture, hunting, forestry and fishing
Mining and quarrying	Mining and quarrying
Food products, beverages and tobacco	Food products, beverages and tobacco
Textiles, textile products, leather and footwear	Textiles, textile products, leather and footwear Wood and products of wood and cork Pulp, paper, paper products, printing and publishing
Chemicals and non-metallic mineral products	Coke, refined petroleum products and nuclear fuel Chemicals and chemical products Rubber and plastics products

	Other non-metallic mineral products
Basic metals and fabricated metal products	Basic metals Fabricated metal products except machinery and equipment
Machinery and equipment n.e.c	Machinery and equipment n.e.c
Electrical and optical equipment	Computer, electronic and optical products Electrical machinery and apparatus n.e.c
Transport Equipment	Motor vehicles, trailers and semi-trailers Other transport equipment
Manufacturing n.e.c; recycling Electricity, gas and water supply	Manufacturing n.e.c; recycling Electricity, gas and water supply
Construction	Construction
Wholesale and retail trade; Hotels and Restaurants	Wholesale and retail trade; repairs Hotels and restaurants
Transport and storage, post and telecommunication	Transport and storage Post and telecommunications
Finance and insurance	Finance and insurance
Real estate, renting and business activities	Real estate activities Renting of machinery and equipment Computer and related activities Research and development Other Business Activities
Community, social and personal services	Public admin. and defence; compulsory social security Education Health and social work Other community, social and personal services Private households with employed persons

Source: SEA WIOD classification (2014)

Table 1.13. List of Variables

Variables	***Data Sources***	***Estimation method***
First-stage dependent variables		
Gross Output prices	SEA WIOD (2014)	Price levels gross output, 1995=100
Intermediate input prices		Price levels of intermediate inputs, 1995=100
Value-added prices		Price levels of gross value added, 1995=100
Value-added per worker (labor productivity)	WDI	$(Domestic\ value\ added\ in\ GDP)/(Total\ number\ of\ employees)$
Independent variables		
I. Trade Measures (First-stage)		
GVC Participation	TIVA (2016)	$(DVA\ in\ foreign\ exports + FVA\ content\ of\ exports)/(Gross\ exports) * 100$
Trade Integration		$(Gross\ Export\ + Gross\ Import)/(GDP\ current\ 2010US\$) * 100$

II. Decomposed Wage and Capital Compensation measures (Second-stage)		
Wage per hour, high-skilled labor	SEA WIOD (2016)	$= ((Total\ Labor\ compensation\ PPP * wage\ share\ of\ high\ skilled\ labor\ in\ total\ wage\ bill)) / ((Total\ hours\ worked\ by\ employees * High - skilled\ labor\hat{}'s\ share\ in\ total\ hours\ worked))$ Here, Total labor compensation (PPP adjusted) $= \frac{Total\ Labor\ Compensation\ (national\ currency\ millions)}{Exchange\ rate\ ratio}$
Wage per hour, medium-skilled labor		$= ((Total\ Labor\ compensation\ PPP * wage\ share\ of\ medium - skilled\ labor\ in\ total\ wage\ bill)) / ((Total\ hours\ worked\ by\ employees * Medium - skilled\ labor\hat{}'s\ share\ in\ total\ hours\ worked))$
Wage per hour, low-skilled labor		$= ((Total\ Labor\ compensation\ PPP * wage\ share\ of\ low\ skilled\ labor\ in\ total\ wage\ bill)) / ((Total\ hours\ worked\ by\ employees * Low - skilled\ labor\hat{}'s\ share\ in\ total\ hours\ worked))$
Total Capital Compensation (PPP adjusted)		$= \frac{Total\ Capital\ Compensation\ (national\ currency\ millions)}{Exchange\ rate\ ratio}$
Skill intensity, high-skilled		$= (Labor\ share\ in\ aggregate\ income\ PPP * Wage\ share\ of\ High\ skilled\ labor\ in\ total\ wage\ bill)$ Here, Labor share in aggregate income (PPP adjusted) $= ((Total\ Labor\ Compensation\ (national\ currency\ millions)) / (Exchange\ rate)) / ((VA\ in\ GDP) / (Exchange\ Rate))$
Skill intensity, medium-skilled		$= (Labor\ share\ in\ aggregate\ income\ PPP * Wage\ share\ of\ Medium\ skilled\ labor\ in\ total\ wage\ bill)$
Skill intensity, low-skilled		$= (Labor\ share\ in\ aggregate\ income\ PPP * Wage\ share\ of\ Low\ skilled\ labor\ in\ total\ wage\ bill)$
Capital to high-skilled labor return		$= (Capital\ share\ in\ aggregate\ income\ PPP) / (High - skilled\ Labor\ share\ in\ aggregate\ income)$
Capital to low-skilled labor return		$= (Capital\ share\ in\ aggregate\ income\ PPP) / (Low - skilled\ Labor\ share\ in\ aggregate\ income)$
Hours worked,		$= (Total\ hours\ worked * Hours\ worked\ by\ high\ skilled\ persons\ engaged\ (share\ in\ total\ hours))$

high-skilled labor		
Hours worked, medium-skilled labor		$= (Total\ hours\ worked * Hours\ worked\ by\ medium\ skilled\ persons\ engaged\ (share\ in\ total\ hours))$
Hours worked, low-skilled labor		$= (Total\ hours\ worked * Hours\ worked\ by\ low\ skilled\ persons\ engaged\ (share\ in\ total\ hours))$
III. Income distribution variables		
Labor share in aggregate income	PWT 9.0	$= (Total\ Labor\ compensation\ PPP)/(Value\ Added\ in\ GDP\ PPP)$
Profit share in aggregate income		$1 - (labor\ share)$

CHAPTER 2: CLASSIFYING GROWTH REGIMES IN AN OPEN ECONOMY: EXTERNAL ORIENTATION, DEMAND, DISTRIBUTION AND ECONOMIC GROWTH

2.1. Introduction

The analysis of comparative capitalism from the perspectives of political economy and structuralist macroeconomics have spawned a long tradition. These studies have classified many growth and development regimes at the global level, based on underlying structures of production, distribution and appropriation. Given the recent spread and expansion of global trade and finance, the impact of external integration on domestic macroeconomic structures differs based on the interaction between global capital and local conditions of production and work. Though economic growth ties all nations in a unified process of capital expansion, the nature or regime of accumulation will vary at the domestic political economy level. This study links processes of external integration or trade globalization with economic growth and development.

This paper contributes to the comparative analysis of capitalist growth regimes in the post-Keynesian and neo-Kaleckian tradition. These studies have identified economic growth to be associated with different demand and distribution regimes. Based on post-Keynesian open economy models of demand, distribution, and growth by Robert Blecker (2010, 2018) and Bhadhuri and Marglin (1990), a theoretical framework is constructed that links externalization and growth through distinct channels of demand and distribution. This interdependent relationship is estimated using principal components analysis (PCA) on a sample of 38 countries. *Most empirical studies analyze the demand and distribution side linkages independently, a gap this paper fills by treating these channels in an integrated framework*. Based on demand and distribution scores,

countries are mapped over time in to four distinct quadrants or regimes of growth. The regimes are *Profit-led/Profit-squeeze* (developed), *Profit-led/Wage-squeeze* (developing), *Wage-led/Wage-squeeze* (transition economies of East Europe) and *Wage-led/Profit-squeeze* (European social democratic nations). This analysis ties together a wide range of structuralist growth models to provide a unified narrative on four regimes of globalization and growth.

This study expands on the global value chain (GVC) tradition by noting that the degree of external competitiveness varies between advanced and emerging nations, which differently impacts the distributional conflict between wages and profits. Greater integration into global export networks and deepening of market mechanisms (recommended in neoliberal policy) are not enough to increase real wages systematically, particularly in emerging nations. Growing competitive pressures on subcontracting firms along with state promoted labor flexibility regimes negatively affect the distributional conflict. Economic growth goes hand in hand with a downward pressure on real wages and wage share. It also expands on the structuralist development tradition in the sense that development and underdevelopment arise out of a single unified process of global capitalist expansion. However, global capital interacts with domestic macroeconomic structure to produce diverse localized implications (as seen in the four-fold typology).

Section 2.2 offers a historical discussion of economic growth globally followed by a review of the literature on structuralist (heterodox) models of growth. Section 2.3 presents a theoretical framework that identifies demand and distribution side channels linking external orientation and economic growth using post-Keynesian models. Section 2.4 identifies variables and discusses the data used to construct distinct component scores for demand and distribution. Section 2.5 justifies the use of PCA for estimation purposes and highlights estimation specifications. Section 2.6

discusses the mapping and distribution of sample countries into four regimes of globalization and growth, and finally section 2.7 provides the conclusion.

2.2. Review of Literature: Contemporary debates on Globalization and Economic Growth

Globalization as a process has linked different regions of the world through trade in goods and money for many centuries. However, since 1980s, production and trade has acquired a distinctly unique and global character. Global trade is essentially being organized around trade in tasks or intermediate inputs rather than trade in final goods. Neoliberal policy views participation in global export markets via economic liberalization as an avenue to enhance economic growth in developing nations. Evidence through the 1990s strongly suggests that neoliberal prescriptions were not compatible with sustained periods of economic growth in developing countries. Failure of this '*one size fits all*' approach to trade and industrial policy can be attributed to its lack of emphasis on underlying structures of demand and income distribution. In fact, greater integration into global networks of trade and production generates diverse growth outcomes across geography based on differences in underlying macroeconomic structures. This paper is an effort to link such contemporary patterns of global trade with different types of growth outcomes across developed and developing countries.

Investigating the multifaceted impact of globalization on economic growth has generated an extensive body of theoretical and empirical literature. Since 1950s, structuralist growth theories emerged as an alternative explanation for rising income inequality (or income divergence) across nations, compared to neoclassical models of growth which highlight supply side dynamics. This approach focuses on economic growth and differs from those that explicitly focus on economic development. For instance, in the political economy of development tradition, emphasis is on

institutional complementarities between state, labor and capital, and possibilities of institutional convergence across nations (Hall and Soskice, 2001).

In contrast, heterodox growth theories focus on the national economy as a unit of analysis rather than on specific institutional actors like firms, labor or state. Such structuralist macroeconomic models of demand, distribution and growth includes an expansive set of contributions in the post-Keynesian, neo-Kaleckian, neo-Harrodian, neo-Marxian and neo-Kaldorian tradition. Foley and Michl (1999) note that though economic growth is a unified process globally, differing impacts of policy on the national economy gives rise to distinct growth regimes from a political economy perspective. This section will provide a brief historical overview of the process of economic growth globally and highlight key theoretical contributions on the topic.

2.2.1. Heterodox Growth Theories in a Historical Perspective

Rapid growth in incomes, wealth, technology and productivity in advanced capitalist economies over the past three centuries has motivated a long tradition of literature focusing on causes and institutions underlying economic growth. Significant increases in population alongside systemic social and technological change characterized Europe in the fifteenth century. This was facilitated by rise of cities, trade in money and commodities, and investment in production and transportation technology. The elite and powerful began to view production and trade as avenues to enhance their domestic power and influence (Foley and Michl, 1999, p.2).

Subsequently, the *industrial revolution* in Britain in the late eighteenth century provided a significant positive shock to such processes of growth and development. Scale of production rose significantly, market oriented agriculture replaced traditional farming, displaced agricultural labor moved to large towns and cities in search of employment, giving rise to wage labor necessary for

industrial capitalism to thrive. Eventually, growing military and economic might of these advanced European nations led to a search for colonies and empires that spread capitalist accumulation to every corner of the world (ibid).

Classical political economists offered early insights on the subject. Adam Smith saw capital accumulation as a long-run cumulative process dependent on forces of division of labor and extent of the market. Finer divisions of labor allow for productivity gains while the extent of the market allows for further division of labor, which together enhances incomes and output in an '*outward spiral*'. Smith envisioned long-run growth as an endogenous process where wages would increase as capital accumulation boosts demand for labor. However, population growth keeps labor supply high enough to prevent profitability of capitalist investments from falling.

David Ricardo linked processes of growth to that of income distribution between classes in society. Contrary to Smith, Ricardo argued that economic growth will reach a *stationary state* in the long run. Capital accumulation will cease with falling rates of profit due to a distributional conflict over surplus between landlords and capitalists. Capital accumulation and population growth will exhaust fertile lands leading to falling rate of profits for capitalists, subsistence wages for labor, and rising rents for landlords.

Finally, Karl Marx highlighted internal contradictions in the process of capitalist expansion leading to periodic and systemic crises in the long run. The idea of falling rates of profit in Marx differs from that of Ricardo, as technological innovation by capitalists would overcome any resource limitation. Instead, Marx argued that as capitalist innovations replace labor with technology, the rate of profit falls due to increased capital per unit of labor, which in turn decreases surplus value (or source of capitalist profit).

This tradition viewed economic growth as the process of capital accumulation and expansion – an economywide transformative process involving structures, institutions, and the socio-political aspects of society (Blecker and Setterfield, 2019). Economic growth and development were theorized in a synonymous way, which began to change in the mid-twentieth century as growth theory emerged as an independent branch of macroeconomic theory.

Data on economic growth through the twentieth century suggests diverse growth outcomes globally. In the first half of the century, a select few advanced nations of Western Europe and North America witnessed the golden age of capitalism with doubling of per capita incomes in a short time. For the rest of the world, economic growth has been rather slow and erratic, as these nations could not keep up with rapid growth in advanced economies. This led to a process of *income divergence* globally and in turn growing income inequality between today's rich and poor countries. However, second half of the century provided evidence of (conditional) *income convergence* with the rise of high-performing emerging economies in East Asia.

Except for a few East-Asian countries, the income gap between rich and poor nations has continued to grow since the second world war. In 1950s, the absolute income gap between industrialized and low-income countries was $3,677 (in 1980 US dollars) which more than doubled to $9,403 in 1980. This suggests that the rich did get richer during this period. However, low income nations got poorer in terms of wealth, not in terms of income. Though average income grew by a meagre $2.70 or so per year, wealth (or GNP) of low income countries declined from 4.3% of industrialized countries income in 1950 to 2.5% in 1980. By 2001, the income gap increased nearly three folds to an astounding $26,280, while GNP growth further declined to 1.4% (Seligson, 2014). In this sense, it would be incorrect to speculate that high levels of growth in some emerging nations today is sufficient to allow for global income convergence.

However, contemporary works have shown that unconditional convergence can be evident in the neoliberal era in the modern parts of the economy rather than the economy as a whole. Rodrik (2012) finds evidence of absolute convergence in manufacturing, not in overall income per capita. Countries that start at lower levels of labor productivity do not grow more rapidly, but industries with low productivity levels grow more rapidly. These stylized facts led to a renewed focus on the role of demand and supply side factors of economic growth in the aftermath of the Great Depression of 1930s**.**

On one hand, the Keynesian revolution emphasized the predominance of effective demand in boosting growth and role of state in boosting demand. Early Post-Keynesians like Joan Robinson and Nicholas Kaldor attempted to extend Keynes' short-run analysis into a long-run analysis of capital accumulation and to move beyond the Marshallian micro foundations. Roy Harrod focused on macro dynamics proposing a cyclical theory of growth with a '*knife-edge*' equilibrium where business cycles are driven by deviations between actual and potential output on the basis of changes in firm's expectations.

On the other hand, Robert M. Solow offered the first structured formulation of neoclassical theory of growth where the economy self regulates itself in response to demand and supply shocks to return to the long run steady state of the economy. As Blecker and Setterfield (2019) propose, all developments in growth theory can be grouped into two broad categories of neo-Classical growth theory (NGT) and Heterodox growth theory (HGT). The latter group includes a wide range of approaches such as post-Keynesian, neo-Marxian, neo-Harrodian, neo-Kaleckian and neo-Kaldorian growth models. Briefly contrasting NGT and HGT is pertinent here.

Firstly, NGT views the long run to be characterized by a steady state which the economy reaches irrespective of the path or policy chosen to get there. The steady state equilibrium is also seen to be stable, as the economy rapidly self-adjusts in response to shocks. Post-Keynesian theory views the long-run as a series of short and medium run phases of macroeconomic activity while Classical-Marxian models see it as a fully adjusted stage where profit rates across sectors are equalized (Blecker and Setterfield, 2019, pp. 8-9). Secondly, while NGT and Classical-Marxian models explore long run supply side dynamics of the growth process, post-Keynesians consider growth to be demand-determined as resource supply and productivity merely limits growth but does not determine it (ibid, pp. 9-10). Moreover, HGT theorizes the supply side in terms of social and technical relations of production while NGT focuses on the technical relations only. Finally, HGT is influenced by the surplus approach in Classical theories of value and distribution while in NGT marginal productivity theory determines factor prices and in turn income distribution.

The above discussion on contemporary heterodox growth theory suggests that aggregate demand and functional income distribution interact endogenously to determine different types of growth. The dynamics of this relationship in the context of an open economy is elaborated below by constructing a theoretical framework.

2.3. Theoretical Framework of Analysis: Demand, Distribution, and Economic Growth in an Open Economy

This section presents a framework that links external integration to economic growth via channels of aggregate demand and income distribution. It is entirely motivated by post-Keynesian and neo-Kaleckian open economy models of demand, distribution and growth, particularly those of Robert Blecker (2010, 2016), Blecker and Setterfield (2019), Bhadhuri and Marglin (1990), and

Barbosa-Filho and Taylor (2006). HGT literature can be classified into two broad groups in the context of external integration. One strand studies the *demand relationship* – how income distribution affects effective demand and in turn capacity utilization and growth, while the second strand studies the *distribution relationship* – how demand affects distribution and growth (Blecker, 2016). Section 2.3.1 discusses the link between external integration and growth via the *demand* linkage while Section 2.3.2 discusses the *distribution* linkage. Section 2.3.3 synthesizes these linkages to classify four regimes of globalization and growth, namely *Wage-led/Wage-squeeze*, *Wage-led/Profit-squeeze*, *Profit-led/Wage-squeeze* and *Profit-led/Profit-squeeze* regime.

2.3.1. External Competitiveness, Demand Relation, and Growth

Post-Keynesians view output and utilization capacity (to a lesser extent) to be entirely determined by aggregate demand in both the short and long run. The underlying distributional conflict between wages and profits is seen to determine changes in demand, giving rise to the demand relationship (depicted by demand curve DD). This section describes how external integration or competitiveness affects growth via the demand relationship in the medium-run.

Open economy effects are typically modeled in post-Keynesian studies using changes in real exchange rate which affect real economy variables of distribution and demand. As nations integrate more heavily into global export markets or global supply chains, gains to growth is strongly mediated by changes in a country's external competitiveness (with exchange rates being a viable proxy). In the short run real exchange rate is exogenously determined by "managed or floating" exchange rate regimes adopted by monetary authorities to enhance trade potential. Such an exogenous effect of exchange rate on income distribution is better justified in an open economy rather than in a closed economy (Bhadhuri and Marglin, 1990). In the medium run, however, real

exchange rate change endogenously in response to changes in nominal exchange rates or differences between domestic and foreign inflation rates (more details in section 2.3.2).

In this sense, changes in external competitiveness (driven by changes in exchange rate) impact growth differently depending on how income distribution impacts demand. Post-Keynesians characterize this underlying demand structure to be twofold – *wage led* demand and *profit led* demand. If an increase in the wage share is associated with an increase in demand (by boosting consumption over investment or trade balance) then demand is wage-led (Kalecki, 1954; Steindl 1952). This relation is typically depicted using an upward sloping demand curve with wage share and utilization on the two axes[15]. On the other hand, if higher wage shares decrease demand, then the regime is characterized as profit-led and depicted with a downward sloping demand curve (Bhadhuri and Marglin, 1990). In other words, wage and profit led demand regimes depend crucially on how the underlying components of demand respond to changes in the functional distribution of income. This channel of effects desires further elaboration.

If an exchange rate depreciation leads to a redistribution of income towards wages (higher wage share on an upward sloping demand curve), it will increase consumption and decrease trade balance while the effect on investment will remain ambiguous (Blecker, 2016). A higher wage share (or lower profit share) will increase consumption as the marginal propensity to consume out of wages (labor income) exceeds those out of profits (capital income)[16]. Growing labor costs per

[15] In this presentation, steady state equilibrium is conceptualized on wage-share and utilization axes. The literature has an alternate presentation using profit share and utilization on the two axes in which case DD curve will be downward sloping. Higher capacity utilization increases wage shares and decreases profit shares in a wage-led demand regime.

[16] Contemporary research emanating from Pasinetti's approach also models the demand relation using savings (instead of consumption) out of wages and profits (Taylor et. al, 2017).

unit of output will make domestic goods less competitive in global export markets, imports will increase relative to exports worsening the trade balance (Blecker and Setterfield, 2019).

Neo-Kaleckian's argue that a higher wage share (or lower profit share) can increase aggregate demand depending on how investment demand responds to changes in profitability of investment. If investment responds weakly to changes in profitability with a lower profit share (considering a nascent capitalist class domestically), growth in investment demand will be insufficient to outweigh increased consumption demand from a higher wage share (Bhadhuri and Marglin, 1990). Blecker and Setterfield (2019), however, notes that higher wage share can negatively impact corporate investment but increase investment in housing or labor-saving technologies (on the supply side). Specifically, if consumption is strongly wage led, then overall effect on investment could be positive. This relationship between profitability and investment is key to the wage or profit squeeze debate among neo-Kaleckians (more on this in the next section).

To summarize, these set of dynamics reflect a *wage-led* demand regime as the positive effects of higher wage shares on consumption dominate the negative effects on investment and trade balance. Consumption (over investment) plays the key role in boosting effective demand in turn increasing capacity utilization (output), capital accumulation (growth) and employment. Real wages increase which in turn keep consumption demand high.

On the other hand, if depreciation induces an increase in profit shares (by increasing firms mark-up) and investment demand responds strongly to changes in profitability (on account of an energetic capitalist class), demand regime tends to be *profit led*. Investment and profitability (over consumption demand) begin to play the key role in boosting demand. In other words, the positive effect of higher profit shares on investment demand and trade balance exceeds the potential

negative effect of lower consumption demand from a lower real wage rate and wage share. This results in higher output, growth and employment from greater external orientation.

Bhadhuri and Marglin (1990) point out the importance of the "trade effect" on demand and output in an open economy. The authors include export demand in the investment function, such that the impact of depreciation on capacity utilization (output) is affected by changes in profit shares and international price competitiveness (exchange rate). If depreciation increases real exchange rates relative to increase in inflation rates, then the total trade effect is positive. Considering Marshall-Lerner conditions hold, this implies that export and import elasticities of demand are greater than one. This trade effect is stronger in open economies that have a higher initial share of trade in income and higher elasticities of export and import. In developing nations trade balance may improve with a significant lag considering J-curve effects. Subsequently, if depreciation results in the positive trade effect dominating the positive effect on output or utilization, open economy becomes more profit-led (ibid, pp. 386-387; Blecker, 2018).

In wage-led demand regimes, however, this trade effect has an ambiguous effect on output and growth. The positive demand effect of higher real wages does not compensate the negative cost effect on international price competitiveness due to increased reliance on the foreign market. Further, the wage-led regime can acquire a profit-led character as open economies pursue strategies focused on boosting trade surplus by depressing labor costs. This is particularly important for outward-oriented developing countries pursuing export-led growth strategies, as relying on a depreciated currency to boost external competitiveness of exports may be pointless if demand is wage-led.

2.3.2. External Competitiveness, Distribution Relation, and Growth

This section elaborates the impact of external integration on growth via the distribution relationship. Given that demand is wage or profit led, the distributional conflict between wages and profits will differ across open economies. This is typically depicted using an upward or downward sloping *distribution curve* (DC) with wage share and utilization (output) on the two axes. In a wage-led demand regime, if higher output and demand result in a decrease in wage share then the distributional regime is *wage-squeeze* (depicted with a downward sloping DC). In the profit-led regime, if higher demand boosts wage shares thereby squeezing out profits the distributional regime tends to be *profit-squeeze* (Blecker and Setterfield, 2019). This is depicted using an upward sloping distribution curve as squeeze on profits induce firms to undertake labor saving technological change. It is important to note that wage and profit squeeze can be associated with both wage and profit led demand regimes. In this sense, growth stimulates technological change (by changing productivity growth) which in turn impacts the distributional conflict.

The distribution relationship is typically modeled in HGT in Marx-Goodwin cycle models (Goodwin, 1967; Marglin, 1984) and the subsequent neo-Goodwin models of Barbosa-Filho and Taylor (2006), Stockhammer et. al. (2011), and Blecker (2010). In the Goodwin model, savings determine investment and capital to output ratios are assumed to be constant, such that the distributional conflict is determined by the interaction between real wage and labor productivity growth (Barbosa-Filho and Taylor, 2006). In the neo-Goodwin tradition, the distribution curve models wage share as a function of output (utilization) and a set of control variables that exogenously impact the wage share. This distribution relationship between wage shares and utilization in an open economy is explained in detail below.

In the medium or long run, real exchange rates change in response to changes in the nominal exchange rate or to changes in the gap between domestic and foreign inflation rates. While nominal exchange rate changes are typically driven by monetary authorities' medium-run target of the real exchange rate (assuming a managed exchange rate regime), inflation rates are affected by distributive shares. On the other hand, wage, prices and distribution (markups) responds endogenously to changes in worker's bargaining position and firm's pricing decisions ((first proposed in Weintraub, 1958; also see Dutt, 1990).

The *conflicting claims* approach first established the link between income distribution and inflation (originally proposed in Rowthorn, 1977). Workers bargaining position is affected by labor market regulations, competition with outside workers, and unemployment rate, while firms pricing decisions is influenced by domestic and foreign competition, capacity utilization or anti-trust regulations (Blecker, 2010). Nominal wage and prices are set by workers and firms who target the wage share and a target profit mark-up rate respectively (Blecker, 2010, ibid, p. 11). A higher wage share implies that the real wage rate grows with improvements in labor productivity (technical change). Firm's price setting is influenced by a target mark-up rate which is an implicit function of the wage share, which suggests that wage and profit shares move in opposite directions.

Such conflicting claims between workers and firms give rise to inflation if both groups increase nominal wage and prices to meet their target levels. Changes in labor productivity also impact the distributional conflict. Increases in labor productivity induces workers to target a higher wage share while firms moderate price increases as unit labor costs rise slowly (Blecker and Setterfield, 2019, p.215).

Blecker (2010) expands this approach to include medium-run open economy effects by modeling the impact of real exchange rates on wages, prices and distributive shares. The author models the mark-up rate as an increasing function of the real exchange rate in the sense that a depreciated currency induces firms to target a higher mark-up. A depreciated currency also induces workers to demand a higher nominal wage by increasing the cost of imported consumption goods. Specifically, exchange rate affects the nominal wage by changing the gap between actual and target wage share, the target wage share itself does not respond to the exchange rate. Thus, if an increase in the real exchange rate (or real depreciation) decreases firms mark-up rate, foreign competing goods become less expensive, in turn increasing real wages and the wage share (ratio of real wages to labor productivity). Conversely, profit shares increase if depreciation increases firm's mark-up rates.

Having established the link between exchange rates and distribution, it is important to incorporate demand effects into the analysis. This involves linking wage and price setting to utilization or output. Blecker and Setterfield (2019) models the target wage share set by workers as a function of the utilization rate. Assuming an inverse relationship between output and unemployment rate, a lower unemployment rate will increase worker's bargaining position enabling them to target a higher wage share. As regards price setting, utilization rates can increase or decrease firms target markups depending on demand conditions. When demand is depressed and sales volume are low, with higher utilization, firms target a lower markup. When demand is robust, firms can raise price without loss in sales volume, thus targeting a higher profit share. Further, productivity growth is conceptualized as an increasing function of output and wage share (first presented in Verdoorn, 1949 and later in Kaldor, 1961). In the long-run, productivity grows

with utilization as firms invest in new capital equipment, while higher wage shares increase productivity as firms invest in labor saving technologies.

On this basis, the distribution relationship (how demand affects distribution) can be represented using a *distribution curve* on a two dimensional plane with wage share on the Y axis and output (or utilization) on the X axis. The slope of this curve reflects the nature of the distributional regime. Firstly, a wage or profit led demand regime can coexist with a *profit squeeze* distribution regime (Bowles and Boyer, 1988). In this case higher output (utilization) increases wage shares and decreases profit shares, represented by an upward sloping distribution curve. The positive effect of output and employment growth on real wages outweighs any potential effect on price increases and productivity growth. Conversely, distribution regime is said to be *wage squeeze* if DC is downward sloping implying lower wage shares (or higher profit shares) result from growth in output and employment. In this case, prices and productivity growth exceed growth in nominal wages (Kiefer and Rada, 2015). A third possibility, not discussed here, is that of a U shaped DC where wage shares fall with utilization initially but then increases beyond a threshold (proposed in Nikiforos and Foley, 2012).

However, the source of distributional conflict between wages and profits will induce shifts in the distribution curve, altering the wage-led or profit-led properties of a given regime. Blecker (2010) identifies two such sources – change in workers bargaining position and change in firm's monopoly or oligopoly power. In the medium-run, an increase in workers bargaining power vis-à-vis firms (in countries with stronger unions or labor market regulations) will endogenously decrease real exchange rates (currency appreciation) but increase wage shares in income, and vice versa. *Loss in export competitiveness alongside lower profit shares, negatively impact investment demand making the open economy more wage-led in demand and more profit squeeze in*

distribution. In a wage led regime, this can be captured by an outward shift of downward sloping DC to the right which increases output (via increased consumption demand) and wage shares further.

Similarly, increase in firm's oligopoly power will decrease both the exchange rate and wage shares, tending the economy towards a profit-led demand regime with growing downward pressure on real wages. This is represented by a rightward shift of the upward sloping DC which increases output and profit shares further. The regime becomes more profit-led in demand and more wage squeeze in distribution. Thus, underlying sources of distributional conflict changes the steady state equilibrium position of a given demand regime. In this sense, Blecker and Setterfield (2019) argue that wage or profit led regimes are theoretically difficult to establish and thus remains an empirical question.

2.3.3. Classifying Globalization-Growth Regimes

In this section, the demand relation (DD curve) and the distribution relation (DC) for an open economy is synthesized to generate four regimes of globalization and growth. These regimes are Profit-led Profit-squeeze, Profit-led Wage-squeeze, Wage-led Profit-squeeze, and Wage-led Wage-squeeze. As countries integrate rapidly into global export markets or supply chains, their external competitiveness is affected by changes in the exchange rate (which changes endogenously in the medium-run). As discussed above, this can be induced by monetary authorities exogenously setting the target nominal exchange rate or via endogenous changes in nominal exchange rate or inflation.

2.3.3.1. Profit-led Profit-Squeeze Regime

Position of a country within the value chain impacts external competitiveness by affecting changes in the real exchange rate. Firms situated at higher nodes of a chain face less competitive pressures being embedded in cordial inter firm networks or governance structures. Supported by a strong currency and significant market power within the chain, these countries (or firms) enjoy higher competitiveness in external markets. These countries have higher initial share of trade in GDP and elasticities of exports and imports greater than one (assuming Marshall-Lerner conditions hold), depicting strong trade effects.

On the demand side, participation in value-chains enhance core competencies of firms which increase profit shares. Higher profit shares increase aggregate demand by impacting underlying components of consumption, investment and trade balance. Possibility of exploiting higher mark ups and prices from integration allows for higher investment on the part of lead firms, increasing their offshoring activities. This in turn increases trade balance at the country level. Investment and trade balance respond more strongly to changes in profitability, and consumption plays a weaker role in boosting demand. In other words, this results in a *profit-led* regime as higher profit shares (or lower wage shares) have a positive effect on effective demand. Consequently, output, capital accumulation and employment increase.

In such profit-led demand regimes, the distributional conflict results in a *profit-squeeze*. Higher demand increases output and utilization by a small amount for two reasons. Sales volume does not compensate for the loss in profit margin per unit of sale and technical change (or labor productivity) does not keep up with growth in labor force participation. Investment in skill development, training and incentive structures for the workforce along with higher bargaining

power of labor allows for an increase in real wages. Evidence of a higher contribution of high-skilled labor in forward linkages of developed nations is well documented in the literature (Timmer et. al., 2014).

In this sense, output and employment grows in profit led regimes from the positive effect of higher profit shares on investment. However, in the presence of strong labor market regulations, higher output or demand goes hand in hand with increase in real wages and the wage share, thereby squeezing out profits.

Thus, in a profit-led/profit-squeeze regime higher wage shares decrease demand while higher output increase wage shares. This regime is typically depicted with a downward sloping demand curve and an upward sloping distribution curve (see Figure 2.1). The long-run steady state equilibrium is *stable.* Starting with a demand shock that shifts the economy to DD1 in the short run, higher output increases wage shares which in turn puts a downward pressure on output as firms seek to reduce excess capacity. Similarly, shifts in DC is induced by change in the sources of distributional conflict. An increase in workers bargaining power or a decrease in firm's monopoly power will shift DC to the left. Lower output decreases wage shares which in turn increases investment in excess capacity. In both cases, the economy returns to the steady state in a *counterclockwise spiral* given any exogenous shock in demand or distribution.

2.3.3.2. Profit-led Wage-Squeeze Regime

Countries in this regime depict lower levels of external competitiveness as they are integrated at lower nodes of value chains. Being integrated in captive inter-firm networks or governance structures, firms face intense competitive pressures from external account liberalization and have little or no bargaining power vis-à-vis lead firms. These countries use

exchange rate depreciation as a tool to enhance integration, boost export potential and trade balance. Lower initial share of trade to GDP along with low export and import elasticities add to their weak competitive advantage in external markets.

On the demand side, participation in value chains does not enhance core competencies of subcontracting firms. However, firms adopt cost cutting labor market strategies to remain viable internationally which along with a depreciated currency boosts export volume. In this sense, redistribution of income towards profits (rather than wages) increases effective demand. Investment demand and trade balance respond strongly to changes in profitability and play the key role in boosting demand (over consumption). State led incentive structures to boost export oriented industries continue to enhance further participation in supply chains in such profit led regimes. Output, utilization, and employment grow along with a decrease in real wages.

On the distribution side, currency depreciation allows for an increase in export volume due to lower prices of exported goods. Higher sales volume outweighs any loss in profit margin per unit of sale for subcontracting firms and labor productivity growth exceeds growth of the labor force. Firms do not invest in skill development of its workforce and have lower bargaining power within the chain, further decreasing real wage rates. In such profit-led regimes, external orientation is associated with a redistribution of income in favor of profits thereby squeezing wages.

Thus, in a profit-led/wage-squeeze regime higher wage shares decrease demand while higher output increases profit shares. This regime tends to be *unstable* and is depicted with a downward sloping demand and distribution curve (Figure 2.2). Considering that the wage squeeze effect is strong, slope of the demand curve is flatter than that of DC. Given a demand shock that shifts demand curve to DD1, the new short run equilibrium is to the left of the long-run steady

state. Lower output increases wage shares which induces firms to reduce output further. Thus, the economy moves away from the steady state in an explosive manner, worsening the distributional conflict. With greater external integration, the economy becomes more and more profit-led and wage squeeze. This regime can be characterized as a "*race to the bottom*" or exploitative as it ends up depressing both utilization and wage shares.

However, it is pertinent to note that the source of distributional conflict will determine the type of distributional regime. Increase in workers bargaining power will change the distributional regime from wage-squeeze to profit-squeeze (by increasing wages), irrespective of whether demand is wage-led or profit-led. This will result in an upward sloping distribution curve on the same axes. Conversely, an increase in oligopoly power of firms within the chain will enhance profit-squeeze tendencies of the regime even further, making it more exploitative.

2.3.3.3. Wage-led Profit-Squeeze Regime

If change in external competitiveness is associated with a positive effect of higher wage shares on demand and a positive effect of output (or utilization capacity) on wage shares, then the economy depicts a wage-led demand regime and a profit squeeze distribution regime.

Countries in this regime are integrated in cordial inter firm governance structures at higher nodes of the value chain and depict high levels of external competitiveness. They perform high value added tasks within the chain and invest in skill development of its workforce, thus increasing real wages and wage shares in aggregate income. Higher wage shares have a positive effect on effective demand resulting in a wage-led demand regime. Consumption demand responds more strongly to changes in profitability (or higher wage shares) than investment or trade balance. In

other words, consumption rather than investment plays the central role in boosting demand in wage led regimes.

On the distribution side, since rise in output or utilization is small in a wage led demand regime, volume of sales does not compensate for the loss in profit margin per unit of sale. Moreover, technical change or productivity growth fails to keep up with the growth in labor force. High-road models of labor at the firm level along with strong labor regulations in such regimes allow for a sustained upward pressure on real wages and wage share. In this sense, growth in capital accumulation, output and employment in such regimes are not large enough to induce a redistribution of income in favor of profits. High levels of external competitiveness go hand in hand with higher real wages, thereby squeezing out profits in the process.

This regime is typically depicted by upward sloping demand and distribution curves (Figure 2.3). However, the relative slopes of these curves are important. If the demand curve is steeper than DC, then distribution regime is weakly profit squeeze (Blecker and Setterfield, 2019) and cooperation between labor and capitalists is possible despite demand being wage led (Bhadhuri and Marglin, 1990). On the other hand, distribution regime is strongly profit squeeze if the demand curve is flatter than DC.

If the profit squeeze effect is strong, then the medium-run steady state in such regimes is *unstable*. A demand shock shifts the country on to a new equilibrium on DD1 curve in the short run. The new short-run equilibrium being below DC means that wage shares increase which in turn increases output further. In other words, to the right of the steady state, wage share and output growth reinforce each other resulting in explosive growth (Blecker and Setterfield, 2019). Similarly, an increase in oligopoly power of firms will shift DC to the right thereby inducing a

wage squeeze (despite the regime being wage-led). However, limits to this expansionary growth can be induced by fiscal austerity, debt crisis, or monetary contraction (ibid, p. 228). External integration in such regimes does not generate sustained economic growth as the economy experiences crises in the long-run.

2.3.3.4. Wage-led Wage-Squeeze Regime

Finally, countries in this regime depict weak external competitiveness and are integrated at lower nodes of value chains. Being situated in captive governance structures, firms fail to enhance core competencies within the chain or invest in skill development of labor. These countries are primarily integrated in supply chains in terms of its backward linkages and gains in domestic value added remain elusive. Lack of export led growth stimulus in such nations further adds to a downward pressure on profit shares.

On the demand side, lower profit shares or higher wage shares increase effective demand in such wage-led regimes. Consumption demand drives the growth in effective demand as investment demand and trade balance do not respond strongly to change in profitability from greater integration. Countries in this regime have a lower level of inequality relative to profit led nations, which allows for a stronger response of consumption over investment resulting in an increase in wage shares and demand. This positively affects growth in output, capital accumulation and employment alongside a decline in profit margins.

However, in such wage led regimes, the distributional conflict results in a wage squeeze. Access to external markets and demand causes higher sales volume to compensate any potential loss in profit margin. Moreover, the pace of technological change (or labor productivity growth) outweighs growth of the labor force. As these countries enhance participation in supply chains,

cheaper access to intermediate inputs and technology transfer increases labor productivity. However, in the presence of weak labor regulations, participation is not accompanied by an increase in real wages. This results in a large increase in utilization capacity or output depicted by a downward sloping and flatter distribution curve (differently from section 2.3.3.3). Consequently, higher profit shares squeeze out wages despite demand being wage-led.

Thus, in an open economy with weak external competitiveness, if a depreciated currency is associated with a positive effect of wage shares on aggregate demand and a negative effect of output (or demand) on wage shares, then the economy depicts a wage led demand regime with a wage squeeze distribution regime. This scenario is depicted using an upward sloping demand and downward sloping distribution curve (Figure 2.4).

The steady state equilibrium in this regime tends to be *stable.* In the short run the economy operates on the DD curve which means that movements along the curve are always towards the steady state. Starting with an expansionary demand shock (to DD1), output or capacity utilization overshoots in the short run. Since DC is below the new short-run equilibrium position, wage shares tend to decline along DD1 which induces further decrease in output. This adjustment process restores the economy back to the steady state in the medium-run. Conversely, an increase in workers bargaining power or a decrease in firm's monopoly power shifts DC to the right. Wage shares increase along the new DC which induces firms to decrease output, thereby returning to the steady state. However, *steady state equilibrium in this regime occurs at low levels of external competitiveness* (compared to profit-led profit-squeeze regime).

The framework presented above models medium-run dynamics, and associations may vary in comparison to short-run and long-run approaches. Secondly, *there is no guarantee that a*

country is perennially wage-led or profit-led. A specific country can change from one regime to another depending on model specification or demand and distributional shocks, as is evident across a wide range of empirical studies.

2.4. Data: Estimating Demand and Income Distribution

Prior to the data discussion, it is important to briefly highlight empirical findings relating to wage and profit led regimes in the literature. This allows for grounding the PCA results of this paper in the empirical tradition.

Empirical works estimating the effect of various demand and distribution factors independently on output, utilization or growth have abounded within the HGT tradition and continue to grow rapidly. Blecker (2010, 2018) groups all empirical studies into two broad categories.

Firstly, *structural models* estimate the independent effects of consumption, investment, or exports and imports on output, utilization, or growth, often treating income distribution as exogenous. The use of linear OLS regressions in these studies can be problematic considering the presence of simultaneity and omitted variable bias between structural variables. Studies in this vein have found evidence of both profit-led and wage-led demand regimes across various samples of developed and developing nations. Stockhammer et. al. (2009) finds demand in the Euro area to be wage led while Onanran and Galanis (2012) find wage led demand in UK, US, France, Italy, Japan, Turkey and South Korea. Naastepad and Storm (2007) identify profit-led demand in US and Japan. Evidence of profit led demand is picked up in small and more open economies of Australia, Canada, Argentina, China, India, Mexico, and South Africa (Onaran and Galanis, 2012). The authors argue that countries like India, Mexico, or Argentina shift from profit to wage led

demand given global distributional changes such as a simultaneous increase in wage shares in all nations.

Secondly, aggregative or system models estimate utilization rate (actual output by potential output) and wage share using VAR or simultaneous equation models. Potential output has been typically imputed using the Hodrick-Prescott filter which is often criticized for giving rise to spurious dynamic cycles that are not validated in actual data (Blecker and Setterfield, 2019). Alternately, recent studies make use of Hamilton measure to estimate potential output. Studies in this tradition finds wage led demand in the long-run in US, UK, France and Mexico (Varghas Sanchez and Luna, 2014; Charpe et. al., 2018) and profit led demand in the short run in the US and in OECD countries (Kiefer and Rada, 2015; Nikiforos and Foley, 2012; von Arnim et al., 2014).

This paper does not estimate the impact of demand and distribution relation on output or income shares specifically, unlike the above papers. The purpose of this exercise is to simply map or group countries into four regimes based on a select set of demand and distribution variables. On the demand side, variables relating to external integration have been used. These include measures for overall trade integration, participation in GVCs, and forward or backward linkage. Such variables capture the impact of the *trade effect* on demand. Determinants of distribution have been measured using unit labor cost (labor compensation by value added output), prices, workers bargaining power (or unemployment to population ratio), and exchange rates. This captures the impact of distributional variables on wage and profit shares.

2.4.1. Measuring Determinants of Demand

Data for the key components of demand has been obtained from the Trade-in-Value-added (OECD TIVA 2016) and Socio-Economic Accounts (WIOD SEA, 2014) data. Impact of external integration on demand has been captured using measures of trade in final goods and intermediate inputs. Firstly, a measure of overall trade integration (in terms of final goods) is calculated using gross exports plus gross imports as a share of GDP. This is a widely used measure of external integration in the empirical trade literature. Gross exports and imports represent final demand measures of trade volume traditionally reported in standard trade statistics.

Higher trade integration implies a stronger trade effect which will increase demand and output depending on how consumption and investment respond to changes in profitability. If external integration increases profit shares, change in investment demand outweighs change in consumption leading to demand being profit led (downward sloping demand). Conversely, the demand regime will be wage led if consumption responds more strongly than investment due to an increase in wage shares (upward sloping demand). Such a stronger response of consumption over investment can be driven by the prevailing level of income inequality. Countries with higher inequality will see a redistribution of income in favor of profits (profit led demand) while those with lower inequality will witness an increase in wage shares (wage led demand).

Secondly, trade in intermediate inputs (distinct from trade in final goods) is measured using the sum of forward and backward participation in exports as a share of total exports. This measure captures upstream and downstream involvement in GVCs. Contemporary studies have highlighted that standard trade statistics are inadequate in capturing participation in value chains as it *double counts* the value of intermediate inputs that cross international borders (Koopman et. al., 2010;

Leamer, 2006). Forward and backward participation in GVCs is identified by decomposing gross exports and imports into their domestic and foreign value added content. Domestic value-added in foreign exports measures intermediate inputs of a country that enters another country's export production as an intermediate input. Foreign value-added in exports represents the value of intermediate inputs from abroad used in domestic export production[17].

Studies have shown that value added measures of trade capture a distinctly different explanation of global trade patterns compared to final good measures of trade. Koopman, Wang and Wei (2008) showed that over 80% of China's exports of electronics constituted of intermediate inputs from abroad. This suggests that though China is heavily integrated in terms of gross trade volume, the extent of integration is much lower in value-added terms. Recent work by Timmer et. al (2014) has confirmed the presence of this trend across a wide sample of developing countries. They find a higher share of foreign value added in exports for all developing nations suggesting greater fragmentation of trade. They also show that majority of domestic value added is comprised by high skilled labor and capital at the cost of low skilled labor. Countries that are integrated at lower nodes of a supply chain (developing nations typically) will depict stronger backward linkages and weaker forward linkages relative to developed nations (ibid). Greater upstream and downstream involvement in GVC's will increase profit shares inducing investment leading to a profit-led demand regime.

[17] These two measures can be combined together to determine GVC participation – "*share of a country's exports that is part of a multi-stage trade process by adding FVA used in a country's exports with DVA supplied to other countries' exports. GVC participation can be useful in estimating the trade-investment nexus, being a useful indicator for the extent to which a country's exports are integrated in international production networks*" (UNCTAD, 2013: 126).

2.4.2. Measuring Determinants of Income Distribution

High or low degree of external integration and competitiveness significantly affect the distributional conflict between workers and firms. In fact, the source of distributional conflict is key in determining the type of demand regime in a country (Blecker, 2010). Advanced nations being integrated at higher nodes or cordial inter-firm networks invest in skill development of its workforce; thus, higher wages put a downward pressure on profit rates. Conversely, developing countries being situated at lower nodes of the supply chain use currency depreciation to boost competitiveness, firms adapt cost cutting strategies to remain viable internationally while labor flexibility regimes increase informality and vulnerability of jobs. Real wage growth is sluggish as higher profits squeeze out wages thus increasing the distribution conflict.

Functional income distribution is typically proxied using wage and profit shares which are measured using labor and capital shares in aggregate income. Evidences of falling labor shares globally are well noted in the empirical literature (Karabarbounis and Neiman, 2014). However, Blecker (2016) maintains that in both wage and profit led regimes, wage and profit shares are determined by various sources such as workers bargaining power, monopoly or oligopoly power of firms, exchange rate, labor productivity, and inflation.

Workers bargaining power is one of the key sources of distributional conflict (Blecker, 2010). With an increase in bargaining power, workers target a higher wage share which puts an upward pressure on wages. The literature typically uses unemployment rate as a proxy, as higher unemployment rate suggests a weakening of labor's bargaining power which in turn decreases wage shares, causing a wage squeeze. Conversely, an improvement in workers bargaining position relative to firms puts a downward pressure on profit shares, slowing productivity growth and

investment demand due to a squeeze on profits. Data on unemployment to population ratio is obtained from the Penn World Tables (PWT 9.1).

Unit labor costs are also considered a key indicator of distributional conflict as it captures underlying changes in labor productivity (or technical change). It is measured as the ratio of total labor compensation to real output (or value-added in GDP). Higher labor costs per unit of output reflect a slowdown in labor productivity thus putting a squeeze on profits, and vice versa. Socio-economic Accounts of the World Input-Output database (SEA WIOD, 2014) provides unique and systematic data on labor compensation, hours worked and value-added in GDP for 40 countries and 34 industrial sectors from 1995-2011. SEA data measures all variables in national currency units (millions). To allow for cross-country comparison, these variables are first converted into purchasing power parity (PPP) dollars by deflating each variable with exchange rate ratio from the Penn World Tables (PWT 9.1). These PPP adjusted labor compensation and output variables are then used to calculate unit labor costs. Countries integrated at higher nodes of a supply chain have lower unit labor costs due to higher productivity emanating from greater technological progress. Developing country firms at lower nodes of the chain face higher labor costs due to sluggish technological change and low levels of labor productivity.

Real exchange rates capture the impact of a country's external competitiveness on income distribution. While change in nominal exchange rates are often set exogenously by domestic monetary authorities, inflation rates are endogenously determined by conflicting claims over price and wage setting between firms and labor. Export led growth regimes have often used depreciation of the currency as a tool to enhance external competitiveness. An increase in real exchange rates imply a currency depreciation which results in a wage squeeze by increasing the cost of imported consumption goods for workers. In countries where elasticities of export and import are greater

than one and M-L condition holds, depreciation would end up increasing profit shares and generate export led growth. Such an effect is stronger in profit led regimes that have a substantially higher starting level of trade in GDP.

Impact of a firm's monopoly or oligopoly power on distributional shares is typically proxied with mark up over prices. With an increase in monopoly power, firms target a higher mark-up rate which puts a downward pressure on the wage share. Price setting in turn depends on the target mark-up rate. Since data on mark ups are hard to observe, we use prices of gross output as a proxy. Using prices of exports, imports or output as a proxy for markups or pricing power of firms can be justified as follows.

Increase in monopoly power along the chain also allows firms to set higher prices (with a larger markup) without any significant loss in sales or profit margin. In other words, firms integrated at higher nodes of the chain have greater price setting power and firms at lower nodes simply perform tasks at the prices set by lead firms. As argued in the Latin American structuralist tradition (Prebisch-Singer hypothesis), pricing power of firms (prices of exports, imports or output) is associated with uneven development between developed and developing nations. Developing nations face deteriorating terms of trade (lower export prices) with lower price setting power, determined by the weak responsiveness of capital accumulation to changes in income distribution (UNCTAD, TDR 2016, p. 101).

2.4.3. Sample Overview

This paper estimates the demand and distribution variables for a panel of 38 developed and developing economies over 17 years. The sample includes 19 developed, 8 emerging and 11 transition economies of Eastern Europe. The choice of sample countries is motivated by the fact

that these are all open economies that are rapidly integrating into global trade networks and have witnessed rapid industrialization in its recent developmental history. Data has been obtained from three datasets for this purpose. Firstly, OECD TIVA (2016) provides data on all trade variables included in the demand score. This dataset is unique in providing systematic data on trade in intermediate inputs. Secondly, data on total labor compensation and total output is obtained from WIOD SEA (2014) to calculate unit labor cost. Finally, data on unemployment, exchange rate and prices of gross output is obtained from PWT 9.1. Summary statistics for all variables used are listed at the end.

2.5. PCA Methodology

This section justifies the use of principal components analysis (PCA) to map 38 sample countries into four regimes of growth in an open economy and discuss model specifications. This allows for comparison of trade and growth regimes across countries and time. Post-Keynesian theory emphasizes the interdependent and causal relationship between forces of demand and distribution. PCA offers an adequate empirical framework to address such simultaneous determination of macroeconomic variables in an open economy by estimating two distinct component scores for demand and distribution side factors. The empirical approach is motivated by Braunstein, Bouhia, and Seguino (2017) who construct four regimes of social reproduction and economic growth.

PCA allows for reducing or scaling multiple dimensions into condensed scores thus showing correlations between variables as well as grouping countries based on similarities in underlying characteristics. The resulting components capture the sign and size of each original variable's contribution in the score. The first component captures variables with the maximum

variance and each subsequent component captures increasingly lesser variation. PCA analysis can be problematic in instances of large amount of missing data in the sample, which is not the case here[18]. The analysis involves estimating scores for three different time periods – 1995-2011, 1995-2007 (pre-crisis), and 2008-2011 (post-crisis) – to assess any change in country positions due to the 2007-2008 financial crisis.

Tables 2.1, 2.2 and 2.3 shows the relative contributions (or loadings) of each demand and distribution side variable in the first component as well as the total variation explained by the first component of demand and distribution. Since all original variables have high variation across country and time, *log normalized values* have been used. Further, variables are averaged over each of the three time periods to generate three distinct cross-sections across countries. This allows for a clearer graphical presentation as each country's position can now be represented using a single data point.

It is pertinent to check if the relationship between variables described in the theoretical framework affirms with the data used. On the demand side, all integration variables (loadings) in component 1 have a positive sign with the demand score. Higher levels of external integration (both in terms of final goods and intermediate inputs) and backward linkages are associated with a profit led regime (downward sloping demand curve). More open economies tend to be profit led in demand, considering that higher profit shares significantly increase investment in export oriented industries thereby boosting output and capital accumulation (Blecker, 2018). Backward linkages in supply chains also serve as an avenue for firms to boost profit shares by tapping on external demand for domestic labor or inputs. Massive increases in export and import volume in

[18] Taiwan and Malta have been dropped from the sample to give a total of 38 countries. These countries do not have a systematic time series for value added measures of trade for the sample time period.

developed and several developing countries points to the primacy of investment in boosting demand. Improvements in external competitiveness increases output, growth, and real wages by boosting profit shares.

On the distribution side, unemployment ratio, exchange rate, and prices are positively associated with the distribution score. This means that higher unemployment rate (or lower workers bargaining power), exchange rate depreciation, and higher prices are associated with a wage squeeze (via its negative impact on wage shares). For instance, higher unemployment implies lower bargaining power of labor which decreases wage shares (or increases profit shares), thereby leading to a wage squeeze. Higher unit labor costs on the other hand have a negative sign which imply that higher costs of production for firms are associated with a squeeze on profits.

Regarding overall explanatory power of the model, component 1 explains 90% variation on the demand side while the first component of the distribution score explains 42% of the total variation. This means that demand factors more strongly explain globalization-growth regimes compared to distribution side factors for the sample countries. Importantly, the PCA approach is adequate in separating sample countries by high or low extent of external competitiveness, as developed and developing nations lie to the right and left side of the Y axis respectively.

2.6. Discussion of Results: Four-fold typology of Growth Regimes in an Open Economy

Figures 2.5, 2.6 and 2.7 show the distribution of advanced, emerging and transition economies across four globalization-growth regimes for each of the three time periods.

Figure 2.5 depicts the four regimes over the entire sample period from 1995-2011. The composite scores reflect context specific values for each sample country, and countries with similar characteristics are positioned closer to each other. Most developed nations lie in the bottom

right hand quadrant which represents profit-led demand with a profit-squeeze distribution regime. This regime includes US, UK, France, Germany, Italy, Japan, Canada, Spain, and Australia. The evidence of a profit led regime in developed nations affirms with a large body of empirical evidence noted in structuralist and aggregative models. Naastepad and Storm (2007) find profit led regimes in Japan and US while Barboso-Filho and Taylor (2006), Nikiforos and Foley (2012), and Von Arnim et al. (2014) find profit led regimes in the US. Kiefer and Rada (2015) find profit led regimes across a panel of 13 OECD countries and Onaran and Galanis (2012) identify similar regime in Australia and Canada.

In such regimes, high level of external competitiveness increases profit shares which boost output and employment via the demand channel. Investment plays the key role in such economies as the effect of a higher profit share on investment or trade balance outweighs consumption demand. On the other hand, output and employment growth in these countries puts an upward pressure on wage shares relative to profit shares, resulting in a profit squeeze. Economic growth in the medium-run is stable as output growth goes hand in hand with an increase in real wages. However, it can be argued that growth in offshoring of tasks and use of labor saving technical change in the industrial sector since 1980s has contributed to the growing vulnerability of low skilled labor in recent times in advanced nations. As Timmer et al. (2014) show, high skilled labor and capital contributes the majority of domestic value-added in US and other OECD countries exports. This suggests that real wage gains are not uniform for all workers within value chains and differ critically by skill levels.

All emerging or developing countries in the sample lie in the bottom left hand quadrant, reflecting a profit-led demand regime with a wage squeeze. These include open economies of Mexico, India, China, Indonesia, South Korea, Brazil, Turkey, and Russia. Profit-led regimes have

been identified in Argentina, China, India, South Africa, Mexico, and Brazil (Onaran and Galanis, 2012; Varghas Sanchez and Luna, 2014; Silva de Jesus et al., 2018). However, Onaran and Obst (2016) caution that small open economies like Argentina, India or Mexico can switch from a profit-led to a wage-led regime given wage shares change simultaneously across them. Higher profit shares in emerging nations also increase demand as investment responds more strongly to changes in profitability than consumption demand. Though China has a trade surplus in the sample data with large volume of exports over imports, external competitiveness remains weak in value-added terms. A large body of GVC literature documents that domestic value-added content of Chinese exports is much lower in comparison to gross measures of exports and imports (Timmer et. al., 2014; Koopman, Wang, and Wei, 2008).

Differently from advanced nations in the sample, higher output, utilization, and employment are not associated with rise in wage shares or real wages. Labor productivity (or technical change) grows faster than the growth in labor force and sales volume adequately offsets any loss in profit margin per unit of sale. It results in higher profit shares and profit rates (especially in state protected corporate sector) which put a downward pressure on wages as firms resort to cost cutting labor market strategies to remain viable competitively in external markets. Labor flexibility regimes in such countries further worsen the bargaining power of labor culminating in growing class tensions, thus economic growth being unstable in the long-run.

Though advanced and emerging nations depict profit led demand, the distributional conflict differs based on firm's positionality within the production network. Low versus high external competitiveness critically impacts the redistribution of income between wage and profits in profit led regimes. In advanced nations, firms enjoy higher monopoly power while workers have greater bargaining power from being embedded in relational governance structures. Output growth is

accompanied by growth in real wages, thus higher wage shares squeeze out profits. Being embedded in captive governance structures, developing country firms have no monopoly power vis-à-vis lead firms while workers have limited bargaining power. State supported export led growth policies allow for an increase in profit shares at the cost of lower real wages, thereby squeezing out wages. A '*Race to the bottom*' scenario emerges with greater integration negatively impacting utilization and wage shares, and the regime becomes increasingly exploitative.

Importantly, there is divergence in outcomes across emerging economies. South Korea (now a newly industrialized country or NIC) is located much closer to developed nations of Europe. It depicts high levels of external competitiveness and is weakly wage-led compared to other developing nations. In the pre-crisis years, however, South Korea lies in the top right quadrant, depicting tendencies of climbing up the value-added ladder (see Figure 2.6). Growth in core competencies of Korean firms within the supply chain is evident in the growing importance and global market share attained by firms such as Samsung, Hyundai, and LG since 1980s. South Korean development experience well documents strong domestic demand conditions boosting investment, output, and real wages along with improvements in income inequality (Amsden, 2001). Export-oriented or vertically specialized industrialization has not engendered such processes of embedded autonomy for most other developing nations (Evans, 1995). India, Indonesia, Turkey and Mexico are closer to each other while China and Russia are closer together. China depicts higher levels of external competitiveness and weaker levels of wage squeeze relative to other emerging nations, being situated closer to the origin.

About 50% of the sample countries are categorized as wage-led (quadrants I and II), while remaining 50% are profit-led (in III and IV). Similarly, about 45% of sample countries are wage squeeze (II and III) with remaining 55% being profit squeeze (I and IV).

Transition economies of Eastern Europe in the upper left hand quadrant reflect wage led demand with a wage squeeze distribution regime. Low external competitiveness implies that consumption responds more strongly to changes in profitability than investment or trade balance. Demand increases despite being integrated at lower nodes of the supply chain. However, the large increase in output in such wage led regimes increases sales volume of subcontracting firms and labor productivity (as firms adopt labor saving technical change). These factors contribute to an increase in profit shares thereby squeezing out wages in these countries. Worker's bargaining power decreases while firms increasingly acquire more oligopoly power. Relative to developing nations, transition economies have a lower level of income inequality and have seen greater gains in education, literacy and wages. In this sense, differences in wealth and income inequality can be one of the key channels explaining opposite demand regimes in the two country groups.

Finally, Austria, Belgium, Sweden, Finland, Netherlands, Denmark, Ireland, Portugal, and Luxemburg are in the wage-led profit-squeeze regime (upper right quadrant). Except for Belgium, Ireland, and Luxemburg, all countries in this quadrant are weakly wage led being closer to the X axis. This affirms with Onaran and Obst (2016) who find wage led regimes for a sample of 11 OECD countries of Europe. These countries depict high levels of external competitiveness being integrated in cordial inter-firm networks which boosts core competencies and real wages of labor. Firms enjoy monopoly power within the chain while workers have higher bargaining power. External integration increases demand by having a positive effect on the wage share.

Consumption demand plays the key role in boosting demand as investment and trade balance do not respond strongly to changes in profitability. Though external competitiveness is high for such countries, the trade effect is weaker compared to US, UK, China, Brazil or India. As Blecker (2018) maintains, stronger trade effects are most likely to be associated with a profit led

regime. Growing output and employment alongside strong labor regulation and welfare safety nets increase real wages and wage shares putting a downward pressure on profits. These economies have historically witnessed significant sustained growth in real wages alongside a greater redistribution of aggregate income in favor of wages. Economic growth in the long-run is stable in these economies if the squeeze on profits is not strong enough to discourage new investment. This scenario is one of '*Climbing up the ladder*'. Firms can enhance core competencies and move up the value chain by strengthening its forward linkages in trade and upgrading to high value added tasks such as marketing, designing and distribution.

Figures 2.6 and 2.7 undertake the same analysis for the pre-crisis and post-crisis periods separately. Results show a similar distribution of countries in each quadrant with one notable difference. The mapping of countries in the post-crisis years varies in scale and magnitude relative to the pre-crisis sample. All country positions seem to have shifted to the left on the graph, suggesting lower external competitiveness in the post crisis years. Financial crisis of 2007-08 has critically affected domestic macroeconomic structures in developing nations changing their relative position compared to the pre-crisis years. The negative demand shock from economic slowdown in advanced nations can explain the shift in relative position of developing countries.

2.7. Concluding discussion

This paper contributes to the structuralist growth and development tradition by highlighting how integrating into a unified process of globalized capitalism impacts domestic macroeconomic structures differently giving rise to four distinct regimes of growth. It constructs a theoretical framework that combines two strands of post-Keynesian studies, those that study the demand relation and those that study the distribution relation. On this basis, external orientation and growth

is linked via channels of aggregate demand and income distribution. To account for the interdependent relationship between demand and distribution emphasized in post-Keynesian research, principal components analysis is used to estimate separate scores for a select sample of demand and distribution variables. Results situate advanced nations in the profit-led/profit-squeeze regime, developing nations in the profit-led/wage-squeeze regime, transition economies in the wage-led/wage-squeeze regime, and a select few social democratic nations of Europe in the wage-led/profit-squeeze regime.

Greater externalization of advanced and emerging nations can be associated with wage or profit led demand and growth, though the distributional regime seems to be opposite across the two groups. In emerging and transition economies, higher output and accumulation are associated with a redistribution of aggregate income in favor of firms and a growing squeeze of profits on real wages. Particularly in the context of labor flexibility regimes pursued by developing countries to promote export-led growth, weakening of workers bargaining power and capitalists market power lies at the heart of the distributional conflict. '*Race to the bottom*' dynamics is evident in emerging economies, where greater export led growth has been associated with a squeeze on wages. On the other hand, sustained state investment in welfare and strong labor institutions explains the presence of profit squeeze tendencies in developed nations.

Empirical studies in the HGT tradition have found mixed results, and regimes identified in this paper can change if demand and distribution change simultaneously across countries. The effort has been to group countries that depict similar characteristics with respect to the underlying macroeconomic structure. Future work aims to develop this analysis in two ways. Firstly, the theoretical framework merely models external integration using changes in real exchange rates. Though this is an adequate proxy for externalization, it does not model the effect of embeddedness

of domestic economies and firms in global value chains or production networks. This being a vital dimension of globalization today, future work will build on Blecker's open economy framework (2010, 2019) to theoretically model and identify the impact of a country's embeddedness on demand, distribution, and growth. A second dimension to incorporate would be to account for the effects of global finance on a country's demand and distribution regime.

2.8. Figures and Tables

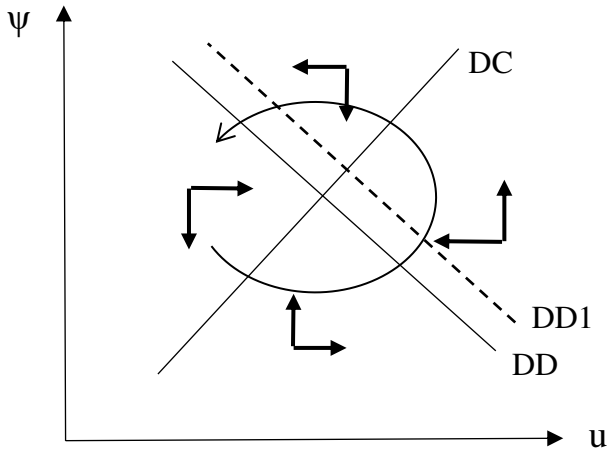


Figure 2.1. Profit led demand with Profit Squeeze

Notes: Long-run steady state equilibrium is stable. Profit led demand is shown by a downward sloping demand curve on wage share and utilization axes. Lower wage shares or higher profit shares increase demand. Profit squeeze is depicted by an upward sloping distribution curve where higher output in profit led regimes increases wage shares.

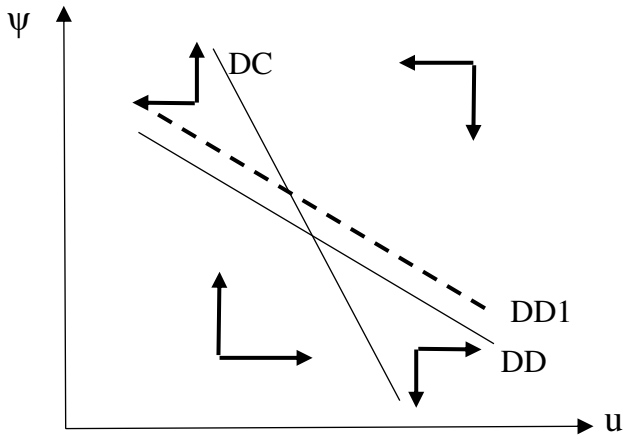


Figure 2.2. Profit led demand with Wage Squeeze

Notes: Long-run steady state equilibrium is unstable, also referred to as Saddle path instability. Profit led demand is shown by a downward sloping demand curve on wage share and utilization axes. Lower wage shares or higher profit shares increase demand. However, wage squeeze is depicted by a downward sloping distribution curve where higher output in profit led regimes increases profit shares.

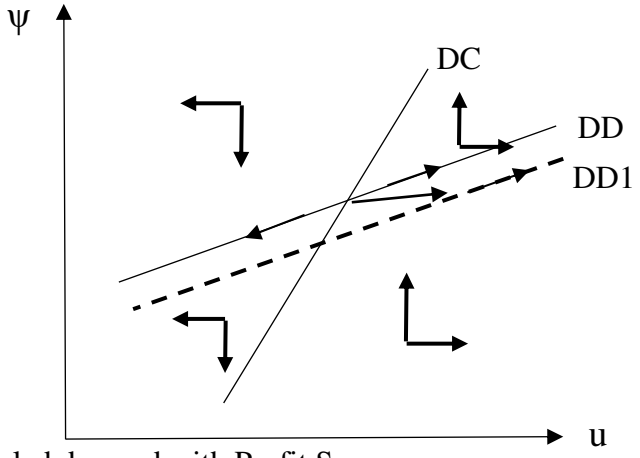


Figure 2.3. Wage led demand with Profit Squeeze

Notes: Long-run steady state equilibrium is unstable with explosive growth to the right of the steady state, if profit squeeze effect is strong. The economy is crisis prone in the long run with periodic booms and busts. Wage led demand is shown by an upward sloping demand curve on wage share and utilization axes. Lower profit shares or higher wage shares increase demand. However, profit squeeze is depicted by a steeper upward sloping distribution curve where higher output in wage led regimes increases wage shares. Stability can arise if profit squeeze effect is weak, in which case the slope of the DC is flatter than DD.

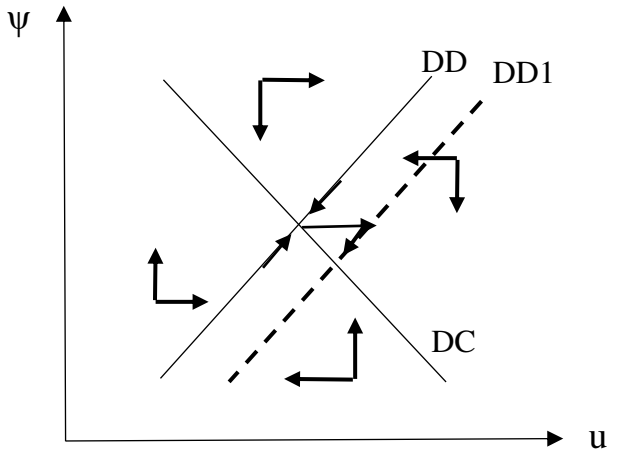


Figure 2.4. Wage led demand with Wage Squeeze

Notes: Long-run steady state equilibrium is stable, with an Overshooting in the short run.. Wage led demand is shown by an upward sloping demand curve on wage share and utilization axes. Lower profit shares or higher wage shares increase demand. However, profit squeeze is depicted by a downward sloping distribution curve where higher output in wage led regimes decreases wage shares. The steady state overshoots in the short run in response to a demand shock but returns to equilibrium in the medium-run.

Table 2.1. Loadings of First Component – Demand-score

Variable	1995-2011	1995-2007	2008-2011
GVC participation (FP+BP/Gross Exports)	0.56	0.56	0.56
Trade Integration (X+M/GDP)	0.59	0.59	0.59
Backward participation (FVA in exports)	0.59	0.59	0.58

Notes: All variables are logged and are means over the specified time period. Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy is a useful test post-estimation, as it shows whether the number of loadings used is adequate for the purpose of creating a composite score. With these three measures, KMO stat for the demand score is 0.72 which suggests that sampling is adequate and using PCA is justified strongly.

Table 2.2. Loadings of First Component – Distribution-score

Variable	1995-2011	1995-2007	2008-2011
Unemployment to population ratio (workers bargaining power)	0.52	0.54	0.45
Exchange rate	0.14	0.06	0.35
Unit labor costs (labor compensation/output)	-0.57	-0.57	-0.57
Prices (gross output)	0.62	0.61	0.59

Notes: All variables are logged and are means over the specified time period. Signs on coefficients remain identical when unit labor cost is replaced with a measure of wage per hour. Gross output prices have been used as an additional variable in order to account for low sample adequacy that results from using 3 variables. KMO measure of sampling adequacy is 0.5 with 3 variables which suggests that using more variables is desirable. With 4 variables the KMO stat is around 0.65, which better justifies the use of PCA.

Table 2.3. Cumulative Variation explained by First Component

Variable	1995-2011	1995-2007	2008-2011
Demand score	0.90	0.90	0.89
Distribution score	0.41	0.42	0.41

Wage-led with Wage Squeeze:

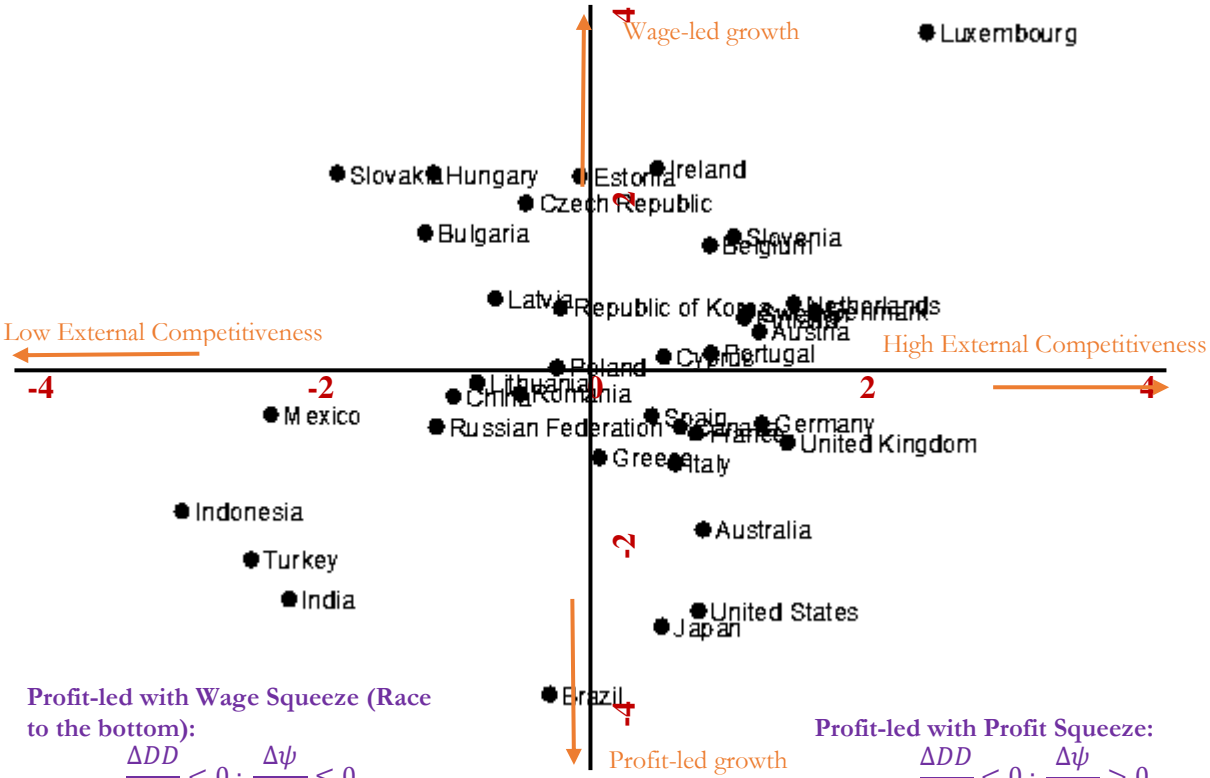
$$\frac{\Delta DD}{\Delta \psi} > 0 \; ; \; \frac{\Delta \psi}{\Delta DD} < 0$$

Long run steady state is stable. Greater integration increases wage shares and demand by boosting consumption. On the other hand, higher output increases sales volume and productivity which increases profit shares (squeezing out wages).

Wage-led with Profit Squeeze (Climbing up the ladder):

$$\frac{\Delta DD}{\Delta \psi} > 0 \; ; \; \frac{\Delta \psi}{\Delta DD} \geq 0$$

Long-run steady state is stable with weak profit squeeze and unstable with strong profit squeeze. Greater integration increases wage shares and demand by boosting consumption. On the other hand, higher output decreases sales volume and productivity (as firms adapt labor saving technologies). Wage shares increase thereby squeezing out profits.



Profit-led with Wage Squeeze (Race to the bottom):

$$\frac{\Delta DD}{\Delta \psi} < 0 \; ; \; \frac{\Delta \psi}{\Delta DD} \leq 0$$

Long-run steady state is stable with weak wage squeeze and unstable with strong wage squeeze. Greater integration increases profit shares and demand by boosting investment. However, output grows with a downward pressure on real wages and distributional conflict deepens.

Profit-led with Profit Squeeze:

$$\frac{\Delta DD}{\Delta \psi} < 0 \; ; \; \frac{\Delta \psi}{\Delta DD} > 0$$

Long-run steady state is stable. Greater integration increases profit shares and demand by boosting investment. However, higher investment demand is sustained by higher real wages in the presence of strong labor protections by the state.

Figure 2.5. Globalization-Growth Regimes: 1995-2011

Wage-led with Wage Squeeze:

$$\frac{\Delta DD}{\Delta \psi} > 0 \; ; \; \frac{\Delta \psi}{\Delta DD} < 0$$

Long run steady state is stable. Greater integration increases wage shares and demand by boosting consumption. On the other hand, higher output increases sales volume and productivity which increases profit shares (squeezing out wages).

Wage-led with Profit Squeeze (Climbing up the ladder):

$$\frac{\Delta DD}{\Delta \psi} > 0 \; ; \; \frac{\Delta \psi}{\Delta DD} \geq 0$$

Long-run steady state is stable with weak profit squeeze and unstable with strong profit squeeze. Greater integration increases wage shares and demand by boosting consumption. On the other hand, higher output decreases sales volume and productivity (as firms adapt labor saving technologies). Wage shares increase thereby squeezing out profits.

Profit-led with Wage Squeeze (Race to the bottom):

$$\frac{\Delta DD}{\Delta \psi} < 0 \; ; \; \frac{\Delta \psi}{\Delta DD} \leq 0$$

Long-run steady state is stable with weak wage squeeze and unstable with strong wage squeeze. Greater integration increases profit shares and demand by boosting investment. However, output grows with a downward pressure on real wages and distributional conflict deepens.

Profit-led with Profit Squeeze:

$$\frac{\Delta DD}{\Delta \psi} < 0 \; ; \; \frac{\Delta \psi}{\Delta DD} > 0$$

Long-run steady state is stable. Greater integration increases profit shares and demand by boosting investment. However, higher investment demand is sustained by higher real wages in the presence of strong labor protections by the state.

Figure 2.6. Globalization-Growth Regimes: 1995-2007

Wage-led with Wage Squeeze:

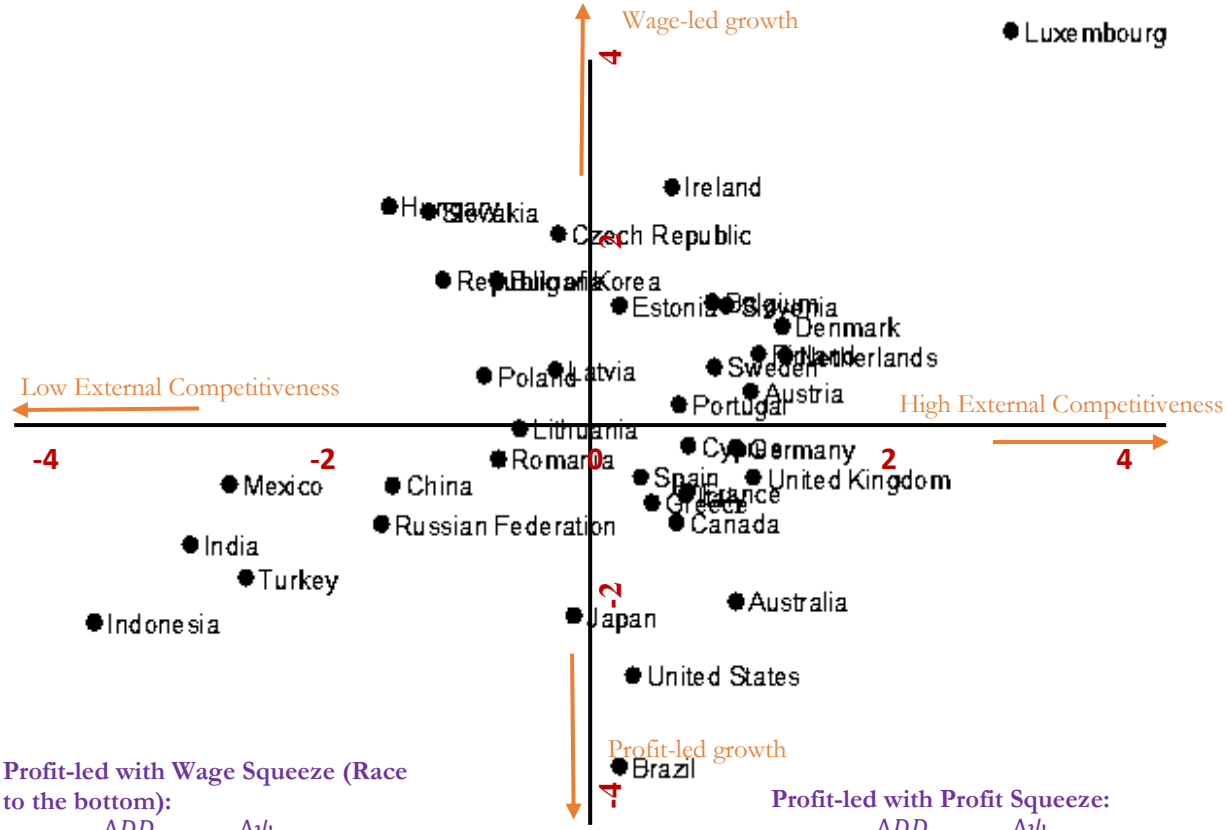
$$\frac{\Delta DD}{\Delta \psi} > 0 \; ; \; \frac{\Delta \psi}{\Delta DD} < 0$$

Long run steady state is stable. Greater integration increases wage shares and demand by boosting consumption. On the other hand, higher output increases sales volume and productivity which increases profit shares (squeezing out wages).

Wage-led with Profit Squeeze (Climbing up the ladder):

$$\frac{\Delta DD}{\Delta \psi} > 0 \; ; \; \frac{\Delta \psi}{\Delta DD} \geq 0$$

Long-run steady state is stable with weak profit squeeze and unstable with strong profit squeeze. Greater integration increases wage shares and demand by boosting consumption. On the other hand, higher output decreases sales volume and productivity (as firms adapt labor saving technologies). Wage shares increase thereby squeezing out profits.



Profit-led with Wage Squeeze (Race to the bottom):

$$\frac{\Delta DD}{\Delta \psi} < 0 \; ; \; \frac{\Delta \psi}{\Delta DD} \leq 0$$

Long-run steady state is stable with weak wage squeeze and unstable with strong wage squeeze. Greater integration increases profit shares and demand by boosting investment. However, output grows with a downward pressure on real wages and distributional conflict deepens.

Profit-led with Profit Squeeze:

$$\frac{\Delta DD}{\Delta \psi} < 0 \; ; \; \frac{\Delta \psi}{\Delta DD} > 0$$

Long-run steady state is stable. Greater integration increases profit shares and demand by boosting investment. However, higher investment demand is sustained by higher real wages in the presence of strong labor protections by the state.

Figure 2.7. Globalization-Growth Regimes: 2008-2011

Table 2.4. Classifying Globalization-Growth Regimes

	Distribution	
Demand	High-Road External Competitiveness	Low-Road External Competitiveness
Wage-led demand	**Wage-led Profit-Squeeze** Firms are integrated at higher nodes of supply chains in relational governance structures. A currency depreciation induces higher wage shares which increase demand. Consumption plays the key role in boosting demand, and investment and profitability weakly respond to distributional changes. Strong labor regulations, higher bargaining power of labor, and higher monopoly power of firms within the chain, increases real wages thereby squeezing out profits. Cooperation or conflict between classes depend on relative strength of the profit squeeze effect.	**Wage-led Wage-Squeeze** Firms are integrated at lower nodes of supply chains in captive governance structures. Depreciation increases wage shares which increase demand. Investment and profitability weakly respond to distributional changes, and consumption demand plays key role. Currency depreciation in such regimes is not useful to enhance export potential. Greater externalization increases competitive pressures on firms who adapt cost cutting labor market strategies. In the presence of labor flexibility regimes, output grows along with a decrease in real wages. The resulting wage squeeze deepens the distribution conflict between classes.
Profit-led demand	**Profit-led Profit-Squeeze** Firms are integrated at higher nodes of supply chains in relational governance structures. A currency depreciation induces higher profit shares which increase demand. Investment and profitability strongly respond to distributional changes, and investment and trade effect play the key role in demand (not consumption). Strong labor regulations and higher bargaining power of labor within the chain, increases real wages thereby squeezing out profits. Economic growth is stable and sustained by increase in real wages. Cooperation between classes is likely.	**Profit-led Wage-Squeeze** Firms are integrated at lower nodes of supply chains in captive governance structures. Depreciation increases profit shares which increase demand. Currency depreciation is used in such regimes to boost export potential by making exports cheaper. Investment, profitability, and trade effect strongly responds to distributional changes, and consumption demand plays a weaker role. Greater integration enhances competitive pressures, firms adapt cost cutting strategies and workers have little bargaining power within the chain. Profit shares grow squeezing out wages. In the presence of weak labor regulations and institutions, conflict between classes becomes more acute and exploitative.

Table 2.5. Summary Statistics

Variable	***Mean***	***Std. Dev.***	***Min***	***Max***
Demand Variables				
GVC participation (FP+BP/Gross Exports) %	45.93	9.58	22.21	71.02
Trade Integration (X+M/GDP) %	73.66	41.18	14.74	296.24
Backward participation in GVCs (FVA in exports) %	65.33	27.43	14.88	179.25
Forward Participation in GVCs (DVA in foreign exports)%	19.41	5.35	9.35	40.41
Distribution Variables				
Unemployment to population ratio (workers bargaining power)	54.93	6.17	28.69	73.29
Exchange rate (national currency/US dollar)	253.18	1364.67	0.05	10389.9
Unit labor costs (labor compensation/output)	59.23	10.44	26.43	104.47
Prices (gross output)	349.36	781.01	86.24	5781.8
Other Variables				
Labor share	0.56	0.07	0.36	0.73
N (observations) = 646				
Time = 17				
Country = 38				

Notes: Taiwan and Malta have been dropped to give a total of 38 countries.

Table 2.6. List of Sample Countries

EU	**New EU members**	**Other Countries**	**G7**	**Asia**	**Latin America**
Austria Belgium Denmark Finland France Germany Greece Ireland Italy Luxembourg Netherlands Portugal Spain Sweden United Kingdom	Bulgaria Cyprus Czech Republic Estonia Hungary Latvia Lithuania Poland Romania Slovakia Slovenia	Australia Canada Japan United States	Canada Japan France Germany Italy United Kingdom United States	China Indonesia Republic of Korea India Turkey Russia	Brazil Mexico

Source: 38 countries in SEA (2014) are organized as per WESP, UN classification of countries. Number of developing nations limited by availability of wage data.

CHAPTER 3: GLOBAL VALUE CHAINS, STRUCTURAL CHANGE, AND ECONOMIC DEVELOPMENT: A DISCUSSION ON REGIONAL DIFFERENCES

3.1. Introduction

Globalization scholars have identified a new phase of globalization in the world economy since 1980s. This phase is characterized by a *quantitative* change in trade and production fragmentation as well as a *qualitative* shift in corporate strategy (Milberg and Winkler, 2013). International trade and investment climate have undergone economic, political, and technological shifts. These shifts have transformed the structure of trade and income distribution, increased trade and foreign direct investment (FDI) flows and increased the role of foreign demand in domestic development. Emerging economies have resorted to export-led industrialization strategies, widespread economic liberalization, and labor flexibility regimes to enhance their external competitive advantage. As advanced and emerging nations integrate into global networks of trade, the impact on economic development varies based on underlying structures and institutions. Contrary to precepts of neoliberal theory, productivity enhancing structural change or sustained economic development has been rather limited in less-developed nations in their post liberalized era (UNCTAD, 2017; Palma, 2003).

This chapter evaluates the impact of trade globalization on economic development through its impact on structural change. The analysis of regional differences in structural change in the development literature is grouped into three broad categories. These studies identify the key role played by industrialization in kick starting and sustaining the development process in less developed nations. Modernization and Structuralist approaches identify state as the agent of social

transformation and emphasize the need to align forward and backward linkages in production and trade. Neo-corporatist and Neoliberal approaches view the state as ineffective in identifying and aligning market incentives, thus creating internal distortions that limit structural change. They recommend deepening of market mechanisms through trade as an avenue to enhance competitiveness and growth. Social systems of production literature identify different paths of development to be associated with underlying institutional arrangements or complementarities between state, labor and capital. However, coordination between firms and state plays the key role in determining the structures of industrial relations that come to prevail.

Data on sectoral composition of value-added trade, output and employment is used to emphasize regional differences in fragmentation of production and structural change. Stronger backward linkages (foreign value-added in exports) and weaker forward linkages (domestic value-added in foreign exports) in GVCs is associated with an ongoing loss in international competitiveness as maintained in structuralist theories. Weak forward linkages imply that developing country firms embedded at lower nodes of the chain find it difficult to enhance core competencies.

Contrary to neoliberal claims, external integration has not boosted the pace of agrarian transition or industrial employment in most developing nations. Post liberalization, a large proportion of total output and employment remains concentrated in the agricultural sector and growth in industrial employment remains sluggish (with a few exceptions). Moreover, dynamics of structural change varies between developing nations by regions. Higher levels of industrialization in Asian countries (motivated by state policies) allowed for a greater degree of structural change and policy autonomy relative to Latin America. In the latter, lack of policy autonomy due to a stronger external influence on domestic policymaking, has limited growth in

industrial employments and increased agricultural indebtedness, thus acutely constraining structural change.

Thus, internal and external constraints on the industrial sector lies at the heart of such challenges to industrialization in developing nations. Given the disintegrated nature of production relations within value chains, external constraints imposed by lead firms on subcontracting industries is important to understand. In this sense, whether greater external orientation is associated with *high-road* or *low-road* models of development remains an empirical question. Empirical studies have not yet linked trade in tasks with dynamics of structural change in a rigorous manner and remains a pertinent area for future research.

3.2. Regional Differences in Structural Change and Industrial Development: Review of Contemporary Literature

Globalization has been defined in the development tradition as the "enfoldment of capitalism in today's historical conditions" (Cardoso, 2008). Since 1980s, vertical disintegration of production alongside technological change and economic liberalization has permitted the restructuring of global production and trade[19]. The rapid spread of global value chains (GVCs) and global production networks (GPNs) is increasingly linking the global economy via trade in intermediate inputs or tasks rather than trade in final goods. External integration has been viewed by policymakers as a strategy to enhance growth and industrial development by modernizing underlying structures of production and employment. The role of state in undertaking and sustaining industrialization is considered central to initiating successful structural change in

[19] Vertical disintegration involves slicing up of the product into sub components and sub-processes which are geographically dispersed to different (low-cost) production locations (Timmer et. al., 2014).

developing countries (Syrquin, 1988). It is pertinent to briefly elaborate the dynamics of this process.

Structural transformation brought about by industrialization "changes the physical landscape of nations via urbanization, internal labor migration, and the establishment of a complex of, typically, urban business enterprises. It also alters many of the cultural, social and other institutional arrangements and affects gender roles and perceptions, class antagonisms and ethnic and racial tensions" (Cypher, 2014, pp. 312-313). In this sense, economic growth and development unfolds as a consequence of such widespread reorientation of economic and social structures in a country, initiated by the process of industrialization. This chapter adopts a narrower and more technical definition of structural change as movement of labor and resources from low to high productivity sectors and employments over time.

However, successful industrialization without systematic agricultural transformation will allow for structural change to be incomplete. As the economy grows, labor and resources move from agriculture to industrial and service sectors and the size of the agricultural sector shrinks. Systematic agricultural reforms (i.e. land redistribution) makes this sector efficient and intensive in its use of physical and human capital. Along with growing technological knowhow, the productivity of remaining agricultural workers increases. Over time, in countries with successful structural transition (developed nations), there emerges a tendency for labor productivity to converge across primary, secondary, and tertiary sectors (or homogeneity in output per worker) (Chenery, 1979). As a consequence, industrial and service sectors account for the largest share of output and employment in such countries.

Data suggests an inverse relationship between labor force in the agricultural sector and per capita income (Cypher, 2014). This trend can be attributed to an increase in total output that emanates from higher productivity of industrial and service sector jobs (relative to agriculture) at higher levels of income per capita. High income nations had about 5% of labor in agriculture compared to about 60% in low income nations in 2010. Similarly, labor in industry and services has a positive relationship with income per capita. Importantly, there is notable differences between developing nations in terms of the sectoral composition of employment. South Korea had about 7% of its labor force in agriculture and remaining 93% in the industrial and service sector in 2010. Relatively, nearly 40% of Indonesia's total labor force was engaged in low productivity agricultural employments.

A large body of development literature has documented the slow pace of agrarian transition and industrialization in most middle and low income nations. Neoliberal reforms (in the 1980s and 1990s) emphasizing widespread economic liberalization has not addressed such bottlenecks, and the experience of structural transition has been quite varied across developing regions. This section will survey and classify key contributions in the political economy of development literature into three broad categories. The rationale for this classification is based on each strand emphasizing the onus of structural change and industrial development on a different institutional actor, such as state labor, or firms. The thrust of this section is to highlight regional differences in structural change as noted in each approach to development.

3.2.1. Modernization and Structuralists Approaches

The *modernization* approach since 1960s has emphasized institutional structures that empowered a state's influence over the private sector in terms of planning systems and public

influence over flows of funds in the financial system (Hall and Soskice, 2001). For instance, India began its era of modernization in the 1950s using a Soviet planning system that focused on developmental targets based on five year plans (Kohli, 2006). The key developmental challenge confronting emerging nations was that of modernizing industries or building an industrial base which was seen to promote modern economic growth. Such an organizational role required to impose industrial targets on a specific industry or firm was entirely attributed to public officials or the state. Early success stories were those of Japan and France.

Development and underdevelopment were thus attributed to the presence of 'strong' states vis-à-vis 'weak' states across countries (Myrdal, 1968). Myrdal offered an institutional theory of development with the state as the key agent of structural change, given its ability to directly influence the growth process. He argued that international trade was biased against poor nations as trade in goods do not end up equalizing factor prices (or wages). In the absence of strong counteracting policies of the state, trade would perpetuate inequalities across regions.

While developed nations with strong states can pursue a coherent development plan, weak state in poor nations lack effective policies to ensure national integration or reduce the impact of colonial institutions that limit development. In poorer nations, state was seen as an institution subsumed by the interests of the top social strata. Investments in the export sector do not generate multiplier effects sufficient to outweigh lingering effects of colonial policy or adverse path dependence. Unlike advanced nations, investment in raw materials did not induce further investment in manufacturing, banking or shipping.

More recently, success stories driven by such state led models of development were witnessed in high performing East-Asian economies of South Korea, Taiwan, Singapore, or Hong-

Kong. Studies began to emphasize the role of industrial strategies, strategy switching, and embeddedness of state institutions in promoting industrial development (Cypher, 2014; Amsden, 1989). Palma (2003) argues that Asian economies differ from Latin American countries in terms of strategy switching. The former pursued import-substituting (ISI) and export subsidizing (ESI) policies simultaneously aligning forward and backward linkages of production in the process, while the latter pursued it sequentially. This points to structural constraints to industrial growth and employment in Latin America.

On the other hand, Peter Evans (1995) argued that regional differences in industrial development can be attributed to the type of state. He identified three archetypes of the state in less developed nations – predatory state, intermediate state, and the developmental state. Predatory (or non-cohesive) states in parts of Africa, Latin America and Middle East are ones where appropriation of unearned income via rent seeking becomes endemic and structural (Cypher, 2014). Intermediate (or fragmented) states in India or Brazil can mount or sustain the project of development and exhibit pockets of efficiency, despite being constrained by predatory archetypes (Amsden, 2001). Developmental states (like South Korea) depict *embedded autonomy* which implies "a concrete set of connections that link the state intimately and aggressively to particular social groups with whom the state shares a joint project of transformation" (Evans, 1995, p.59).

In this context, the state should have the autonomy to ensure compliance, mobilize a development vision and create domestic economywide competencies. However, this classification does not describe the origins of different state forms. Kohli (2004) argues that the type or form of colonialism which was imposed on the nation determines to a great degree the nature of the state form that will endure long after independence.

Instead of focusing on internal constraints, Latin American Structuralist and the subsequent Dependency schools emphasized the external constraints to state led development and structural change. The structuralist school observed an ongoing process of loss in international trade. Growth opportunities are limited due to weak terms of trade structured by the composition of exports and imports, thus resulting in underdevelopment as a structural problem in Latin America (Prebisch, 1949; Singer, 1950). International trade was characterized by developing countries importing manufactured goods and exporting raw materials and agricultural goods (which has low technological content and low wages for workers). Though manufactured goods have high technological content which should lower its price, unions and other organized sectors in developed countries withheld such productivity gains. This creates a structural gap between center and periphery countries that cannot be simply explained via short-term price fluctuations (Cardoso, 2008). Weak terms of trade and lack of export diversification is sufficiently documented in Latin America, Africa and South Asia in contemporary data.

Dependency school argued development to be limited by forces external to socio-economic formations in periphery nations. As previously isolated regions integrate in the world system, "development and industrialization of these regions is choked off or channeled into directions which are not self-perpetuating or promising", giving rise to what Frank defines as "development of underdevelopment"[20] (Frank, 1949, ibid.: 286-289). The negative influence of transnational corporations, international regulatory agencies and foreign governments in limiting structural change and development were highlighted. Instances such as the debt crisis in Latin America in

[20] Frank conceptualizes 'Development of Underdevelopment' as a process in which underdeveloped regions see increasing satellization by the world metropolis on one hand, and acute polarization of the domestic economy on the other (p.286-287). Integration of poorer nations into the global capitalist system, rather than exclusion from it, generates such structures of underdevelopment.

the 1980s and Asian financial crisis (1997-98) provided strong evidence in support of this narrative. These studies have stressed on the lack of technological dynamism or transfer of knowhow as impediments to capital accumulation in the periphery (Venango, 2006).

Paul Baran (1957) emphasized the destructive aspects of monopoly capitalism and saw underdevelopment in the periphery to be driven by colonialism's extraction of 'economic surplus'[21]. Economic surplus in poorer regions remain constrained due to three sources – national capital, foreign capital and state. National capital is constrained by a half-hearted pursuit of ISI policies, foreign capital generates enclave effects, and the state is 'weak' to launch a systematic project of development. In this sense, developing nations will not achieve the final stage of 'mass consumption' as predicated in Rostow's five stages of growth.

Cardoso (1979) argued against this idea of stagnation in poorer nations and proposed the concept of *associated dependent* development. In this framework, growth and development can occur from a developmental alliance between TNCs and an authoritarian state. However, TNCs don't become all powerful due to their reliance on high and middle income consumers in the periphery who drive their sales. In the presence of good state policy, collaboration between domestic and foreign capital can allow for modest reforms and autonomy in some poorer nations.

Thus, the focus in these studies is on the state as an agent of structural, social and institutional change[22]. It does not emphasize the role of firms or organization of the private sector

[21] Economic surplus refers to 'the mass of resources, actual and potential, which a society could have at its disposal in order to facilitate economic growth; it is the amount that might be reinvested in productive ways to increase the future level of social output' (Baran, 1957, p.144).

[22] It is pertinent to note that in contrast to the above tradition, a parallel genealogy draws upon global divisions of labor within global capitalism and the role of imperialism in driving dependent development. In the works of Lenin, Luxembourg, Trotsky, Bukharin and the more sociohistorical dependency theorists, capitalist relations play a more consequential role than the state as in the Latin American Structuralist approach.

in this process. This is important particularly in the contemporary context of globalization and export led development where adjustment is often firm led.

3.2.2. Neo-Corporatist and Neo-Liberal Approaches

A second approach of *neo corporatism* became popular through the 1970s which focused on state's ability to undertake successful bargaining with firms and organized trade unions in terms of wages, conditions of work, and socio-economic policies (Olson, 1965; Przeworski and Limongi, 1993). Higher level of development was associated with the degree of concentration or centralization of the trade union movement. Olson (1965) argued that union size is critical to internalizing the effects of wage settlements with smaller unions being less capable of undertaking successful collective action.

Early studies in this tradition emphasized the tripartite relation between labor, firm, and state in institutional change. Focus was on systems of policy making where concentration of power by state or labor assumed central prominence. Given this literature's emphasis on labor's potential for collective action and the presence of strong unions backed by the state, success stories were limited to small open economies of Northern Europe (Sweden in particular). In the context of liberalized emerging economies, the application of neo-corporatist ideas is rather limited.

Future developments in this tradition went hand in hand with the rise of neoliberal political regimes in Britain and the US. A neoliberal critique of development and a neoliberal theory of the state emerged in the works of P. T. Bauer (1984) and Anne Kruger (2004). These works emphasized development to be driven by deepening of market mechanism (trade being one channel) and government austerity.

Bauer's analysis looked at peasant based, export oriented economies in West Africa (Ghana and Nigeria). He argued that native crops (agricultural crops like cotton, peanuts, palm oil) were atypical in the sense that their prices rose in international markets, which checks the tendency of terms of trade to deteriorate over time. Native cultivation supported by favorable prices led to the emergence of an indigenous (elite) agricultural class that promoted the vision of modern economic growth in government and industry. Neoliberals have utilized Bauer's theory of the state to highlight its negative role in development. Public sector is seen to enhance economically distorting controls that incentivize inefficient production and ineffective economic structures (Cypher, 2014).

Deepak Lal (1985) argued that East Asian miracle economies employed a policy of 'virtual free trade' as they tampered with market outcomes just enough to stimulate exports. In the absence of state protections, firms are forced by the market either to become competitive with imports or exit from the market.

Anne Kruger proposed an even stronger critique of development theory in her ideas of the factional state and rent-seeking behavior. State is seen as a repository of rents via subsidies, tax exemptions, tariffs and other government policies. Interest groups to whom such rents accrue have a vested interest in maintaining such policies in place. In poorer nations, a larger state sector generates more rents resulting in the pathological result of a rent seeking society. Neoliberals have argued that reducing the size of the state through greater deregulation and privatization of state institutions would appease this problematic. However, countries that have seen a stronger shift towards neoliberalism have performed quite poorly, like that of Chile and Mexico (Cypher, 2005). Their claim that the East Asian economies were examples of free market models of trade have been proved to be unfounded over time.

3.2.3. Social Systems of Production Approaches

The s*ocial systems of production* approach during the 1980s and 1990s (influenced by French Regulation school) encompassed studies on sectoral governance, national innovation systems, and flexible production regimes. Essentially, it highlighted the reorganization of production in the context of technological change[23]. Though the state plays a key role in such approaches, the onus of structural change is primarily attributed to firms.

This approach emphasized changes in firm behavior – moving away from mass production to new production regimes of flexible specialization (craft forms of production)[24] that rely on collective institutions at regional, sectoral and national level (Piore and Sabel, 1984, Lazonick, 1991). The competitiveness of these regions is based on cooperative competition between firms and the broad skills of the laboring community (Piore and Sabel, 1984, pp. 268-275). Firms in such clusters can produce a broader range of products in smaller quantities and can speed up the process of innovation. Industrial development arising from economywide spillover effects of technology and skill sharing becomes a pathway to sustainable development.

Subsequent work argued differences in structural change and employment relations across regions based on business strategies adopted by firms. Adaptive strategies by firms in poorer nations lead to *low-road* models of employment due to cost cutting strategies and lack of investment in skill development of labor (Chandler, 2005; Williamson, 1981). On the other hand,

[23] This involves the industrial relations system, the system of employee and managerial training, internal structures of corporations, structured relationships within the companies of the sector and with suppliers and customers, financial markets, conceptions of fairness and justice shared by labour and capital, the structure of the state and its policies and country-specific customs, traditions, norms, morals, rights and standards of conduct (Moszynski, 2015).

[24] Flexible specialization refers to a "strategy of permanent innovation: accommodation to ceaseless change, rather than an effort to control it. This strategy is based on flexible—multi-use—equipment; skilled workers; and the creation, through politics, of an industrial community that restricts the forms of competition to those favoring innovation. For these reasons, the spread of flexible specialization amounts to a revival of craft forms of production that were emarginated at the origins of mass production" (Piore and Sabel, 1984).

innovative business strategies by firms in advanced nations lead to *high-road* models of employment on account of institutional complementarity between firms, labor and state (Lazonick, 1991).

Two heavily influential contemporary approaches on industrial development deserve a mention here. Firstly, the *Varieties of Capitalism* (VoC) approach by Peter Hall and David Soskice (2001) propose that the level of development (and structural change) depends on underlying institutional arrangements. They classify countries into *liberal market economies* (LME's) and *coordinated market economies* (CME's), based on strategic interactions between state and firms giving rise to distinct forms of employment relations and policies. Firms in LME's coordinate their tasks using hierarchies and competitive market arrangements (arms-length market transactions and formal contracting) where market institutions coordinate activities of actors. Firms in CME's rely on non-market relationships (relational or incomplete contracting, network specific transfer of information and monitoring) to coordinate tasks and build core competencies. In this sense, stability of a given institutional configuration and complementarity of its components become important.

A competing explanation to VoC is that of *Regulation theory* (influenced by the French Regulation school). Unlike VoC's focus on types of capitalism at a given point in time, it analyzes the stages of capitalism. Each phase of economic history is characterized by an *industrial paradigm* (mass production versus flexible specialization), an *accumulation regime* (mode of production, consumption and distribution) and a mode of regulation that operates to stabilize the system (Boyer, 2005). Each permutation of these three factors results in a distinct model of national

political economy or development[25]. As capitalism goes through periodic crises, it generates social and political tensions that require an economywide reconfiguration of competition and production relations. Such reconfiguration based on institutional complementarities has created successful developmental regimes that could not have been predicted ex ante (Boyer, 2005).

A key criticism of this framework is that national institutional structures (corporate governance, labor market regulations, or education and training) depend on regulatory regimes instituted by the nation-state (Hall and Soskice, 2001). Further, it fails to recognize the extent to which firms and nations may achieve upward mobility within a given mode of production. This aspect has been the focus of the literature on Global Value Chains (GVCs) or Global Production Networks (GPNs) (Gereffi et al., 2005; Henderson et. al., 2011).

3.3. Regional Trends on Value-added Trade and Structural Change

The above review highlights regional differences in dynamics of structural change and economic development across developed and developing nations. Though all three strands of the literature are united in emphasizing the role of industrialization, they differ in their focus on internal and external constraints to development. Neo-liberal theory undermines the importance of external constraints, attributing under development to domestic factors such as capital shortage, state inefficiency and corruption, or resource misallocation. Social systems of production highlight the impact of both domestic and foreign competitive pressures and technological constraints that impact firm level organization. Finally, Structuralist approaches narrow down on the external

[25] Being a variant of Marxist theory, regulation school argues that capitalism not only creates a social structure but is also generated by the social structure itself, in turn highlighting the embeddedness of the economy in social, cultural and political institutions and contexts (Boyer and Salliard, 2002).

constraints to development and the role of foreign firms and governments in limiting structural change in the periphery.

This section presents data on sectoral composition of value-added trade, output and employment from the Trade-in-Value Added (OECD-TIVA, 2016) and WDI (World Development Indicators) datasets. On the basis of contemporary data on fragmentation of global trade and structural change, insights from the three competing approaches to development will be evaluated.

3.3.1. Trends in Fragmentation of Production and Trade

We begin by discussing the composition of value added trade in terms of forward and backward participation in global value chains. Data is presented by regions, sectors, and years for a sample of 62 developed and developing nations.

Measurement of value-added trade or trade in intermediate inputs as opposed to overall trade volume and policy (proxied by exports, imports, and tariffs) has been a subject of much debate. Koopman et al. (2010) argue that since official trade statistics is measured in gross terms, it 'double counts' the value of intermediate inputs that cross international borders (see Leamer, 2006 for a discussion on shortcomings of trade statistics)[26]. Contemporary GVC estimates decompose gross exports into its domestic and foreign value-added content (UNCTAD, 2017; Koopman et al. 2010). Foreign value-added (FVA) in exports represent that part of a country's exports that is made with inputs produced in other countries (backward participation). Domestic

[26] To elaborate, raw material extraction in country A is processed in country B which then enters the manufacturing stage in country C and finally ends up as final demand in country D (new value being added at each stage of production). Standard statistics on trade volume reports value of exports or imports in final demand, which double counts the value-added at each previous intermediate stage of production (UNCTAD, 2017)

value-added (DVA) in foreign exports refers to that generated domestically and can be expressed as a share of GDP or as a share of global value-added trade (forward participation)[27].

The much-cited study of Apple i-pods by Dedrick, Kraemer, and Linden (2008) and Koopman, Wang, and Wei (2008) show that on average over 80% of value-added in Chinese exports (of computers, or office equipment) is from foreign countries. Figure 3.1 affirms this trend for China, as around 80% of total exports comprised of intermediate inputs from abroad from 1995 to 2007 and has shown a slight decline since. A similarly high share of FVA in total exports is also evident in Thailand (70%), Turkey (40%), South Korea (66%) and India (34%) (see Figure 3.2). This suggests that though developing nations are heavily integrated in terms of gross exports and imports, majority of their exports are made with intermediate inputs from abroad. Integration into global value chains is primarily in terms of backward linkages evident in lower proportion of DVA in foreign exports. They perform lower value-added tasks within the chain and majority of value added gains from such tasks accrues to foreign lead firms and countries.

Contemporary studies continue to find evidence of fragmentation of production globally. Timmer et. al (2014) finds that foreign value added shares has increased for 85% of the 560 product chains included in their analysis. Importantly, for both developed and developing nations, higher FVA in exports confirms the presence of fragmentation of production. Firms are increasingly relying on value chains to source intermediate inputs instead of producing such inputs in-house. Figure 3.3 shows the share of forward and backward participation in GVCs for four regions. Asian countries are most integrated into value chains as the total share of DVA and FVA in exports is

[27] DVA and FVA capture upstream and downstream involvement in GVCs, and the extent to which industries rely on internationally integrated production networks. Data on value added trade by industry can provide useful indications of comparative advantages and competitiveness of countries, and hence form a basis for development strategies and policies (ibid).

the largest among all regions. In terms of backward linkages, Asia has the highest share among developing nations, followed by Africa and Latin America.

However, in terms of forward participation, developed countries have the higher share in GVCs relative to developing nations. Average share of DVA in exports is about 22% in developed nations, 19% in Asia and 17% in Africa. The average value for Asia is higher because of the inclusion of South Korea and Indonesia in the sample whose share of DVA is 21% and 24% respectively. Figure 3.2 shows that for most other developing nations, forward participation in GVCs is lower than the average. DVA constitutes 14% of total value-added exports in Turkey, 15% in Thailand, 18% in India and 12.5% in China. Lower content of DVA implies that domestic production of higher value added inputs that can be used in other countries' export production remains constrained in emerging nations (including China).

While the share of FVA in exports grew by 17.1% in developed nations between 1995 and 2011, DVA content in foreign exports increased by 6.7%. In Asian countries in comparison, FVA changed by 18.2% while DVA increased by 6%. This implies that though forward linkages are growing they do not sufficiently outweigh the simultaneous growth in backward linkages.

Finally, Figures 3.4 and 3.5 show the sectoral composition of backward and forward linkages in GVCs for the four regions. Majority of intermediate inputs imported by developed nations are in the industrial sector (22.3%), followed by agriculture (12.9%) and services (8.5%). This aligns with evidence of offshoring of industrial employments from developed nations since 1980s. In contrast, industrial sector accounts for nearly 33% of Asia's import of intermediate inputs followed by the service sector (15.2%) and agricultural sector (11.7%). It is evident that developed nations are linked more heavily in agricultural supply chains through its backward

linkages, implying they rely on agricultural inputs from less developed nations. Asia, Latin America and Africa on the other hand rely more on industrial inputs from developed nations. Regarding forward linkages, industrial and service sectors play a more significant role in both advanced and less developed regions. Importantly, Latin America has the largest share of agricultural DVA in exports highlighting this regions dependence on agricultural exports and lack of export diversification.

Weaker forward linkages along with stronger backward linkages are indicative of structural constraints, with growth being unbalanced in developing nations (Hirschman, 1984). Domestic firms or nations struggle to enhance core competencies or produce high-value added inputs within the value chain. Thus, external constraints from greater integration can adversely impact a country's potential for structural change and economic development.

3.3.2. Trends on Structural Change

This section describes trends on sectoral output and employment shares over regions, sectors and time. Given the context of growing fragmentation of production globally, it is crucial to see how sectoral composition of output and employment (structural change) has evolved in developing nations. Use of manufacturing sector output and employment shares as a proxy for structural change is motivated by the long-established claim in development economics of manufacturing (or industrialization) being the engine of growth (Kaldor, 1966; Chenery, Robinson, and Syrquin, 1986). Manufacturing is seen to create productivity gains and catch-up industrialization of the sort not attainable generally through the service sector. If trade patterns shift labor and resources away from high-productivity industrial work, structural change will not enhance aggregate productivity.

Contemporary studies note that sustaining high levels of manufacturing output and employment shares alongside high levels of wages and living standards has become increasingly difficult in the modern era (Rodrik, 2009; Felipe et al., 2014). Felipe et al. (2014) shows that manufacturing employment shares in several developing economies have begun to decline at much lower levels of income than in today's developed economies. Decline in manufacturing output shares have been negligent in comparison to the sharp drop in employment. Thus, manufacturing employment shares are often considered a better predictor of prosperity than output shares (ibid).

Two channels can be identified to drive this effect. Firstly, increases in value-added trade and global competition makes centers of manufacturing activity more sensitive to wage improvements (Hasan, Mitra, and Ramaswamy, 2007). As rise in wages leads to substitution of capital for labor, it negatively affects employment shares much more than output shares. Secondly, technological and efficiency gains derived from global mass production can be labor-displacing. Labor displacing technological change in manufacturing (and not other sectors) will lower employment shares in manufacturing much more than output shares (Cowen, 2013).

Figure 3.6 and 3.7 shows clear evidence of successful structural transition in developed economies but not as much in developing ones. Beginning with sectoral composition of output, agriculture contributes a mere 1.6% of total value-added in GDP in developed nations relative to 12% in Asia, 6% in Latin America and 8.7% in Africa. The failure of developing countries to move away from its agricultural dependence is further affirmed in the share of agricultural to total employment. Agricultural employment (on average) accounts for a staggering 30% of total employment in Asian countries, followed by 24% in Africa and 17.4% in Latin American nations. In comparison, developed nations had a meagre 3.2% of total employment in agriculture through 1995 to 2011.

Slowdown in the pace of industrialization is evident in all regions except Asia. Industrial sector in Asia had the largest share of output and employment relative to the other regions. Industry accounted for about 20% of value-added in GDP and 22% of total employment in Asian countries between 1995 and 2011. On the other hand, service sector accounts for the majority of value-added output and employment in all regions. Advanced nations have the largest share of output (66%) and employment (71%) followed by Latin American nations with 55% and 61% respectively.

Particularly in Latin America, agricultural and industrial employment are lower than in Asia or Africa, but service sector employment is higher. The failure of industrial policies (ISI and ESI) to promote industrialization has led to a movement of labor and resources to service sector, implying incomplete structural transition.

Falling levels of manufacturing employment is often cited as evidence of a trend towards deindustrialization. In Figure 3.8, all advanced countries have a declining trend in industrial employment over the sample time period, with industrial employment in the US declining from 25% in 1995 to 20% in 2011. However, Germany and Japan have the highest shares of industrial employment (though declining) which coincides with their larger share of industrial value added among all developed nations. No systematic evidence of deindustrialization is evident in developing nations (see Figure 3.9). Industrial employment shares have remained stable or increased for all select countries. Weak evidence of de-industrialization at lower levels of income per capita is evident for Brazil and Thailand where industrial employment has declined starting 2008 and 2004 respectively. South Korea is a stronger exception where industrial employment behaves similarly to advance nations in terms of a declining trend throughout the period. However, a longer time series beyond 2011 is needed to attribute any clear trend of deindustrialization across developing economies.

3.3.3. Comparing China and the US: A Discussion on Global Imbalances

Comparing the sectoral composition of value-added trade, output and employment in China and USA can serve as an illustration of how external constraints differently impact structural change in developed and developing nations.

China is more integrated into global export markets in terms of gross exports and imports relative to the US. Exports and imports as a share of GDP increased from 34.2% in 1995 to 50.7% in 2011 in comparison to an increase from 22.5% to 30.1% in the US. In value-added terms, sum of DVA and FVA in gross exports increased from 65% to 72% in China and 48% to 60% in USA during 1995-2011. Both nations are increasingly participating in trade in intermediate inputs rather than trade in final goods (as was the case prior to 1980s). However, they differ in terms of their composition of forward and backward participation in GVCs, which has implications for structural change.

Figures 3.1 and 3.10 show that around 80% of Chinese exports constitutes of intermediate inputs imported from abroad, while the share is around 58% for the US from 1995-2011. In contrast, China provides merely 20% of intermediate inputs (relative to 40% for US) used in global export production, implying weak forward linkages in GVCs. This suggests that integration in GVCs is not at higher nodes of value chains. China essentially engages in assembling and low value added manufacturing tasks for lead firms who supply majority of intermediate inputs needed in such tasks (Palit, 2008; Banga, 2015). Thus, US is linked into global export markets in terms of strong forward linkages (supplying high value-added inputs to China and others), while China is linked through strong backward linkages. China relies on high value-added inputs from abroad for

generating high value-added domestic exports. This implies lack of gains in competitive potential for domestic firms.

Such active insertion into global export networks (backed by a state directed project of development) has generated both industrialization and structural change in China to a larger extent than in most developing nations. However, unlike the US, the process of industrialization has not sufficiently reduced China's dependence on the agricultural sector. Despite widespread land reforms during the late 1950s, agrarian transition continues to remain sluggish. On average, agriculture accounts for 13.2% of total value added in GDP and 45.6% of total employment between 1995-2011. In comparison, agriculture accounted for a mere 1.1% and 1.8% of total output and employment in the US in the same period. Though industrial sector contributes the second largest share of total GDP in China (32.4%), it also accounts for the lowest share of total employment (25.5%) among the three sectors. Such slow pace of agrarian transition along with a slow growth in industrial employments (not output) is suggestive of incomplete structural transformation in China.

US has achieved successful structural change as services account for 74% of total output and 75% of total employment over the 17 year period. It has reduced its agricultural dependence (small share of total employment in this sector) and has witnessed deindustrialization evident in lower manufacturing output and employment shares relative to China and other emerging nations.

In this sense, greater external orientation has gone hand in hand with successful structural transformation in today's developed nations. Historically, the embeddedness of state institutions in coordinating activities of firms and labor towards a collective project of structural transformation characterizes the US development experience in late nineteenth and early twentieth

century. However, the case of China depicts a curious problematic of structural change in the context of globalization. China's rapidly growing importance in global trade and finance is well documented in the literature and data. Its emergence as a global manufacturing center along with its net creditor position with the US, has allowed China to maintain trade surpluses with respect to the rest of the global economy. Though China has seen gains in competitiveness, integration into global commodity chains has essentially been in terms of backward linkages, which has limited the pace of structural change.

Despite successfully undertaking industrial strategy switching in the presence of an *active* state, external constraints on Chinese industrialization remains pertinent. In terms of trade, rising external demand for Chinese agricultural and manufacturing goods (being cost-effective) continues (private and public) investment in low wage employments. Lack of skill investment in labor allows for marginal gains in domestic value added by labor in exports (weak forward linkages). In terms of finance, constraints emanate from challenges faced by the state in managing its engagement with global finance as well as spreading the role of finance domestically (Vasudevan, 2018). In this sense, a deeper look in terms of the role of global imbalances on the process of structural change in emerging nations is imperative.

3.4. Production Fragmentation, Structural Change, and Development Theory

This section links trends in fragmentation of production and trade with the analysis of structural change as proposed in the development literature. The growing share of value-added trade and backward linkages in GVCs indicates that developing nations are rapidly participating in supply chains thereby increasing global fragmentation of production. Greater external

orientation coexists with varying levels of export diversification, industrialization and agricultural transition across developing nations.

Neoliberal theory advocated for reducing the role of the state and deepening the role of market mechanisms through greater external orientation. Constraints to development were considered to be internal to the country and freeing the markets could only improve efficiency and growth of domestic sectors. Contemporary data provides least evidence for such a narrative on development. Developing nations (based on neoliberal policies) pursued systematic economic liberalization of trade and finance to enhance growth through the 1980s and 1990s, which resulted in economic slowdowns in most nations in time. Contrary to their claims of East Asian development being one of 'virtual free trade', these countries did not merely tinker with market mechanisms to promote exports. In fact, presence of a developmental state was central to building and aligning forward and backward linkages and strengthening core competencies in external markets.

Neoliberals do not emphasize external competitive pressures and influence of lead firms and governments of advanced nations on economic development in the periphery. Kruger's notion of rent-seeking undermines the role of external factors in development, reducing the development imperative to issues of domestic organization and governance. This concern has been explicitly studied in the social systems of production and structuralist approaches.

Evidence in this paper is not sufficient to validate the efficacy of conclusions in the social systems of production literature. Firm level data analysis is imperative to better capture changes in industrial relations and firm level organization, which is beyond the scope of this paper. However, one aspect is worth highlighting. A shift away from mass production to flexible modes

of (craft) production has been evident in advanced nations (if not in emerging ones), with a significant growth in demand and wages of high skilled labor. Timmer et al. (2014) show that high-skilled labor and capital contributes to the majority of domestic value added generated in both developed and developing countries. In such flexible modes of production (as permitted via GVCs), the declining importance of less skilled labor can be seen as a negative consequence of firm led models of development.

In fact, regional differences in structural change and the role of external constraints to development strongly aligns with contributions in the modernist and structuralist literature. Conversely to Neoliberals, Structuralist theories emphasize how external orientation is associated with a slowdown in agrarian transition and sluggish industrial growth in less developed regions of the world.

Economic liberalization exposed domestic firms and labor to cut throat global competition, enhancing the role of external firms and governments in domestic development. Increasing pressures to produce high volume and quality of goods at affordable prices impacted the process of structural change negatively. Pressures from international regulatory agencies to enhance fiscal austerity, led to a reduction in agricultural subsidies and other protections of the state. In the process of promoting export led industrial development, agricultural policy was neglected leading to widespread agrarian crises in Asian, Latin American and African countries. As evident in the data, agricultural dependence remains strong with the sector employing majority of the labor force and yet contributing a much smaller proportion in total GDP. Loss of primary means of agricultural livelihoods created a massive pool of displaced agricultural labor seeking employment in the industrial sector.

Combined with the sluggish growth of industrial sector due to growing pressures from foreign and domestic suppliers, industries struggled to absorb displaced labor from agriculture leading to an outburst of informal employments in less-developed nations. Structural transformation, in the manner described in dual-economy models of Arthur Lewis, does not seem to have played out much the same way in developing countries. Though all developing nations have witnessed industrial growth (to different degree), failure to equalize marginal productivities and wages across sectors remains a common thread.

Slower growth of output and employment in the industrial sector of Latin America relative to Asia suggests that structural change has taken different paths in the two regions. Though Asian economies in comparison saw higher levels of industrialization, failure to move labor from low productivity agricultural to high productivity industrial jobs remains a potent challenge to structural transition. Unlike Bauer's evidence of openness being linked with possibilities of widespread agricultural development that sustains the process of industrialization, there is no such evidence in African or Latin American nations.

Instead, Latin American structuralist explanations of deteriorating terms of trade in developing countries remain relevant. Though developing nations increasingly supply a larger proportion of manufacturing exports than before 1980s, improvements in terms of trade is limited as these industrial goods have a lower technological content than those of its developed country counterparts. Export basket of Latin American and African nations comprise of natural resources (like oil and minerals) and high-value added agricultural exports, which keeps terms of trade weak. In contrast, South Korea has seen favorable terms of trade due to systematic export diversification from medium to high value added industrial production. Particularly with respect to global supply chains, such an ongoing process of loss in international competitiveness continues to be observed

in value added trade data. As Banga (2015) maintains, gains from value chain integration accrue to nations that export inputs with higher domestic value added content. Developing nations having weak external competitiveness struggle to enhance their forward linkages in the face of growing competitive pressures.

Thus, different paths of industrialization in Asia and Latin America can be attributed to a combination of three factors – nature and success of industrial strategy, role and embeddedness of the state, and influence of external countries and regulatory agencies on domestic development. Presence of an *active* state in emerging Asia allowed for a planned project of development where industrial policies of ISI and ESI were pursued in consonance, thus aligning forward and backward linkages (both domestically and internationally). Growing output and market share in the world economy allowed these nations some degree of policy autonomy in the face of external interventions. In contrast, failure of ISI strategy to stimulate industrial growth in Latin America in the late 1980s led to a complete shift from ISI to ESI strategy, which further disrupted linkages between sectors. The role of external constraints (imposed by structural adjustment programs of IMF and World Bank) and lack of policy autonomy were pivotal in distorting the process of industrialization in Latin America.

3.5. Conclusion

The dynamics of trade, structural change and economic development has been extensively studied in the context of final goods. However, works analyzing this link in the context of intermediate input or task trade has been a new development, partly due to the lack of data availability till 2014. This paper is a preliminary attempt to understand this contemporary pattern of trade globalization in terms of its impact on structural change. Though development and under-

development are part of a single unified process of global reorganization of trade and production, countries differ due to variation in institutional structures.

Structural disadvantages between regions do not necessarily arise from control over product prices as predicated in neoliberal theory. Instead, it arises from increased asymmetry of market structure within value chains and production networks, making the role of strategic industrial-trade policy imperative. Firms face growing competitive pressures to produce high quality products at cheap costs, state policies focus on enhancing external competitiveness using export-led strategies that rest on lower labor costs, and labor faces growing vulnerability and insecurity in terms of jobs. Institutional complementarities are difficult in this regard as interests of each actor is not aligned towards a unified model of development. Upward mobility within value chains no longer remains as feasible as predicated in GVC studies.

This chapter simply offers a preliminary discussion on external constraints limiting structural change in emerging nations. A stronger connection between global value chains and structural change needs to be established through rigorous empirical analysis. Considering the paucity of empirical works explicitly testing this causal linkage, future work will be intended in this direction.

3.6. Figures and Tables

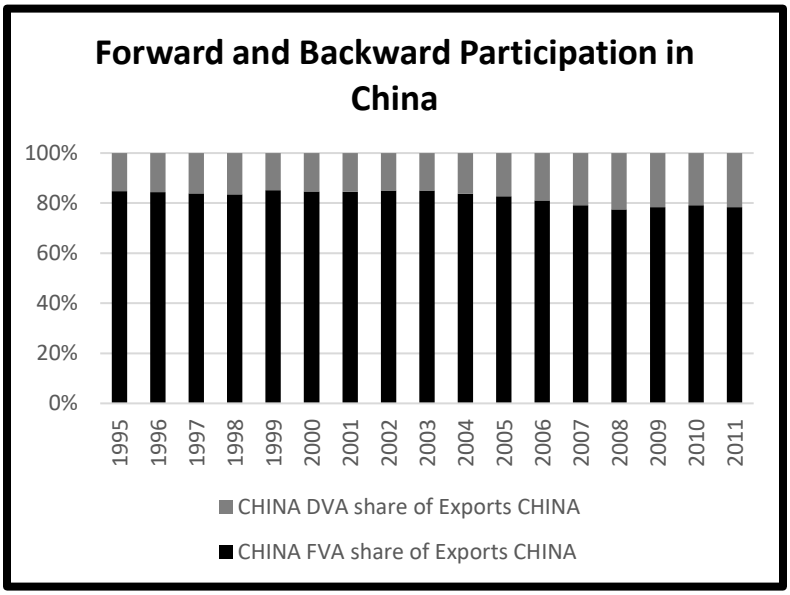


Figure 3.1. Forward and Backward Participation in China

Notes: Authors calculation using OECD TIVA (2014) data. Data shows DVA in foreign exports and FVA in exports for China from 1995-2011. Majority of Chinese participation in GVCs is via the backward linkage, and majority of value added from tasks performed within the chain accrues to foreign firms in advanced countries. Such participation has not been associated with gains in domestic value-added as predicated by GVC studies.

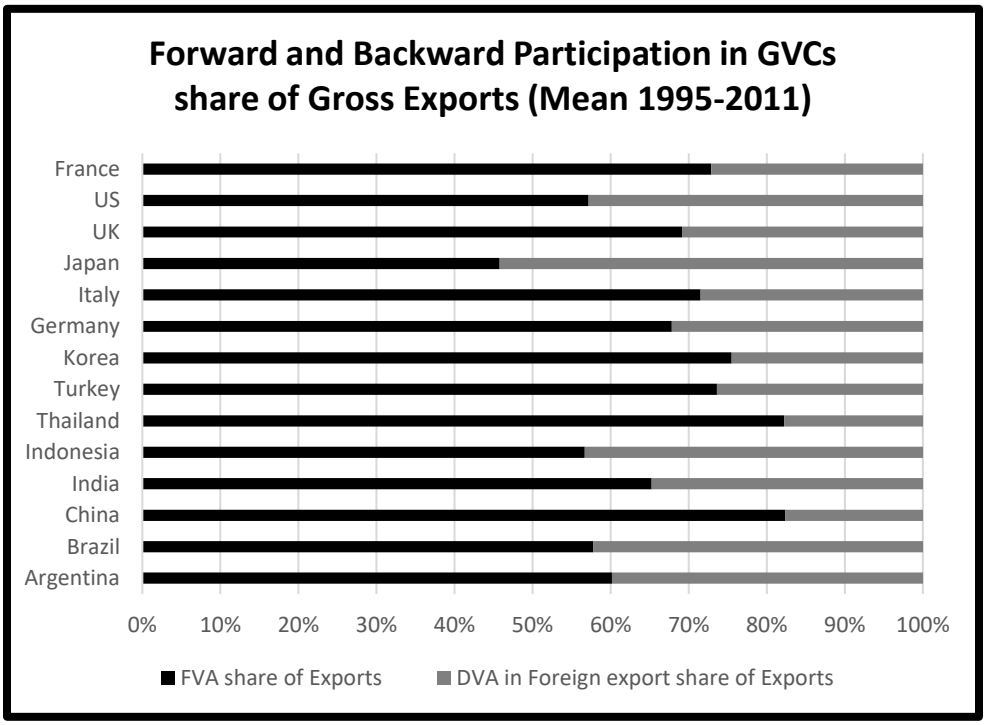


Figure 3.2. Forward and Backward Participation in GVCs share of Gross Exports (Mean 1995-2011)

Notes: Authors calculation using OECD TIVA (2014) data. Forward participation is measured in terms of domestic value-added content in foreign exports. It represents intermediate inputs used directly in the production of exports in other countries. Backward

participation is measured using foreign value content of a country's gross exports. It refers to the volume of imported inputs from abroad used in a country's production of exports. DVA and FVA as a share of gross exports has been averaged over the time period 1995 to 2011 for select sample countries. Large share of FVA in gross exports is suggestive of global fragmentation of production.

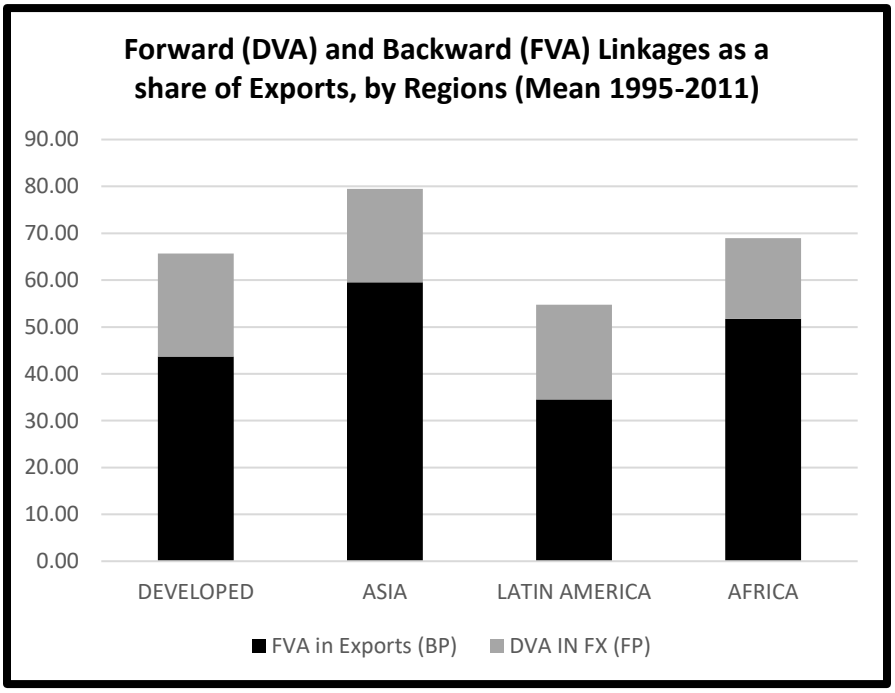


Figure 3.3. Forward (DVA) and Backward (FVA) Linkages as a share of Exports, by Regions (Mean 1995-2011).

Notes: Authors calculation using OECD TIVA (2014) data. Countries included in each regional group is as follows. Developed category includes US, UK, Germany, France, Italy, Japan, Australia, and Canada. Asia includes Cambodia, China, India, Indonesia, Malaysia, Philippines, Russia, Saudi Arabia, Singapore, Thailand, Vietnam, Hong Kong, Turkey, and South Korea. Latin America includes Chile, Mexico, Argentina, Brazil, Colombia, and Peru. Finally, Africa includes Morocco, South Africa and Tunisia. The small sample of African and Latin American nations is due to paucity of value added trade data for more countries in this region. Forward participation is measured in terms of domestic value-added content in foreign exports. It represents intermediate inputs used directly in the production of exports in other countries. Backward participation is measured using foreign value content of a country's gross exports. It refers to the volume of imported inputs from abroad used in a country's production of exports. DVA and FVA as a share of gross exports has been averaged over the time period 1995 to 2011 for select regions. Large share of FVA in gross exports is suggestive of global fragmentation of production.

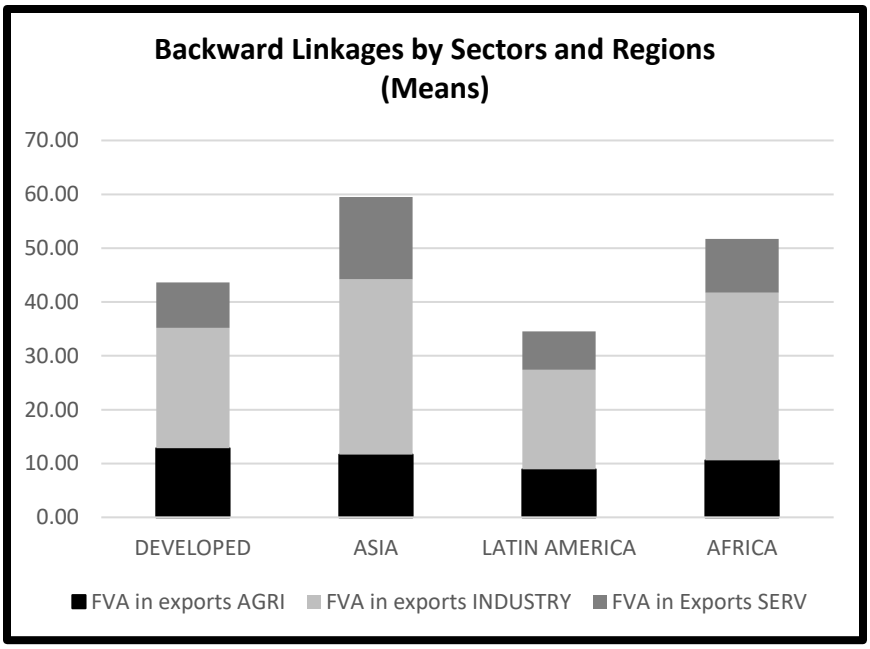


Figure 3.4. Backward Linkages by Sectors and Regions (Means)

Notes: Authors calculation using OECD TIVA (2014) data. This figure shows backward participation (DVA in foreign exports) in GVCs by four regions and 3 broad sectors. Though industrial sector accounts for the bulk of backward participation in GVCs, agriculture and service sectors however account for a significantly large portion of FVA compared to Figure 6 below.

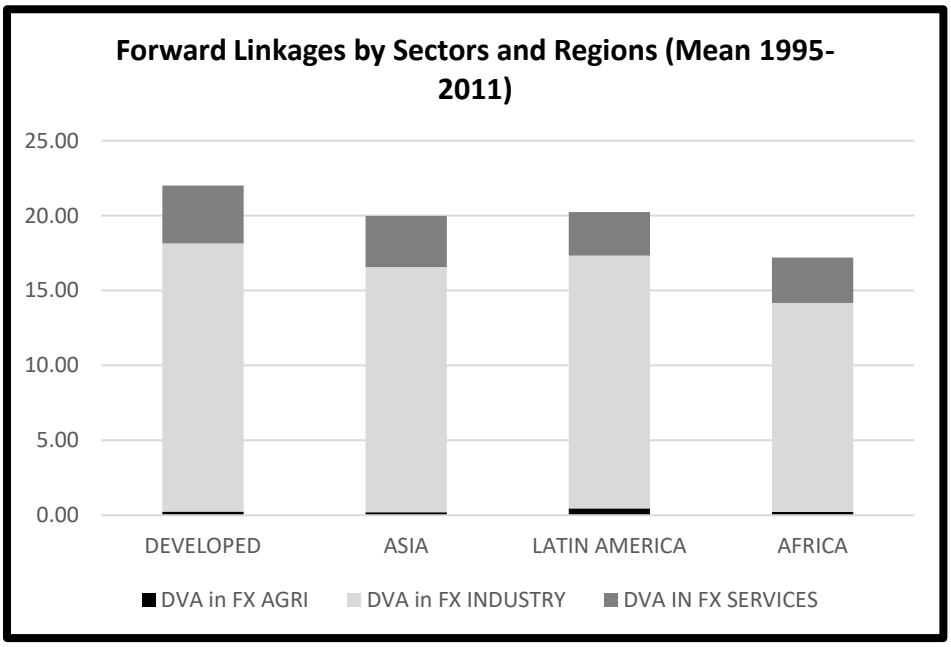


Figure 3.5. Forward Linkages by Sectors and Regions (Mean 1995-2011)

Notes: Same calculations using OECD TIVA (2014) data as in Figure 5, but this figure depicts the level of forward participation (DVA in foreign exports for four regions and 3 sectors. Evidence shows that in all countries the majority of domestic value added is contributed by the industrial, while agricultural sectors contribution in DVA is negligible.

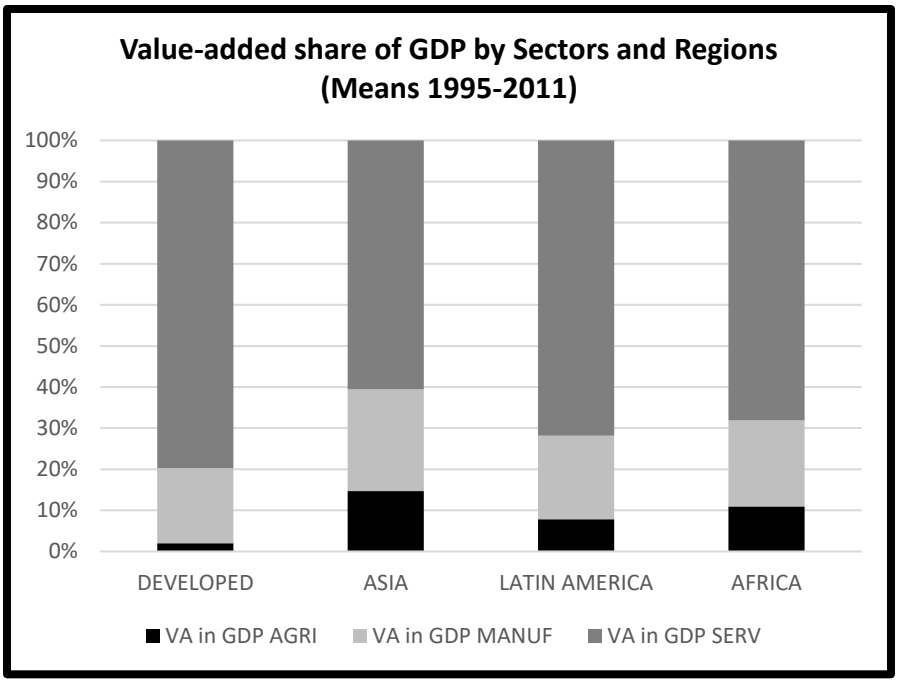


Figure 3.6. Value-added share of GDP by Sectors and Regions (Means 1995-2011)

Notes: Authors calculation using World Development Indicators (WDI) data. Values are means of agricultural, manufacturing and service sector value-added as a share of GDP over 17 years for developed, Asia, Latin America, and Africa. Agricultural share of value added in GDP remains much larger for developing nations relative to developed ones. This suggests that structural transition remains constrained and labor and resources remain concentrated in low productivity agricultural tasks.

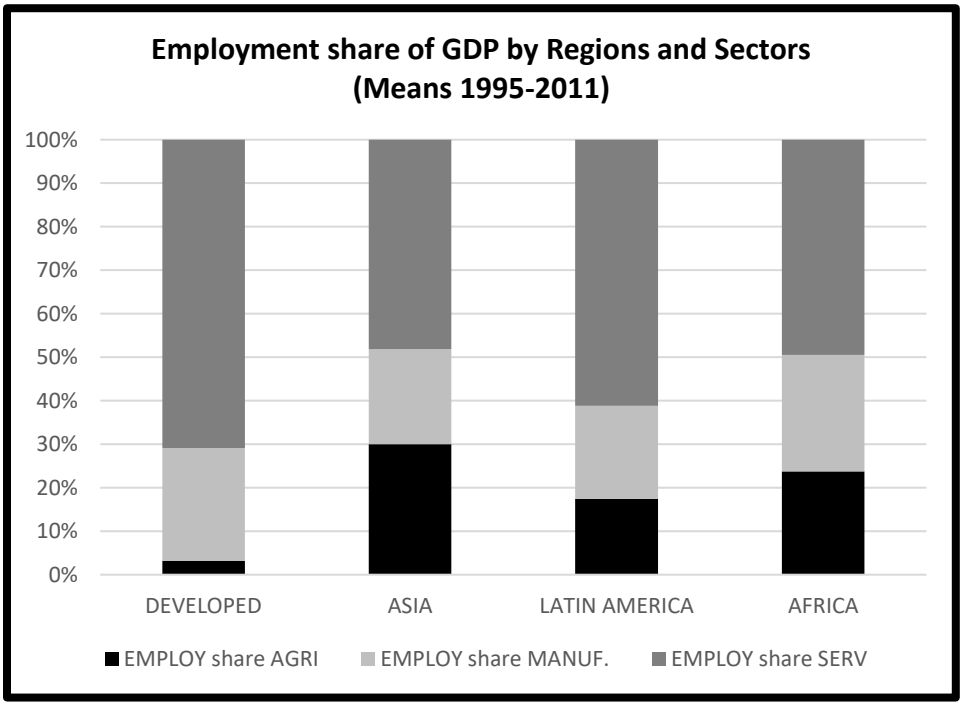


Figure 3.7. Employment share of GDP by Regions and Sectors (Means 1995-2011)

Notes: Authors calculation using World Development Indicators (WDI) data. These values represent mean sectoral employment shares as a percentage of total employment for four regions and three sectors over 17 years. Similar to Figure 7, higher agricultural employments in emerging nations affirms the presence of constrained structural change.

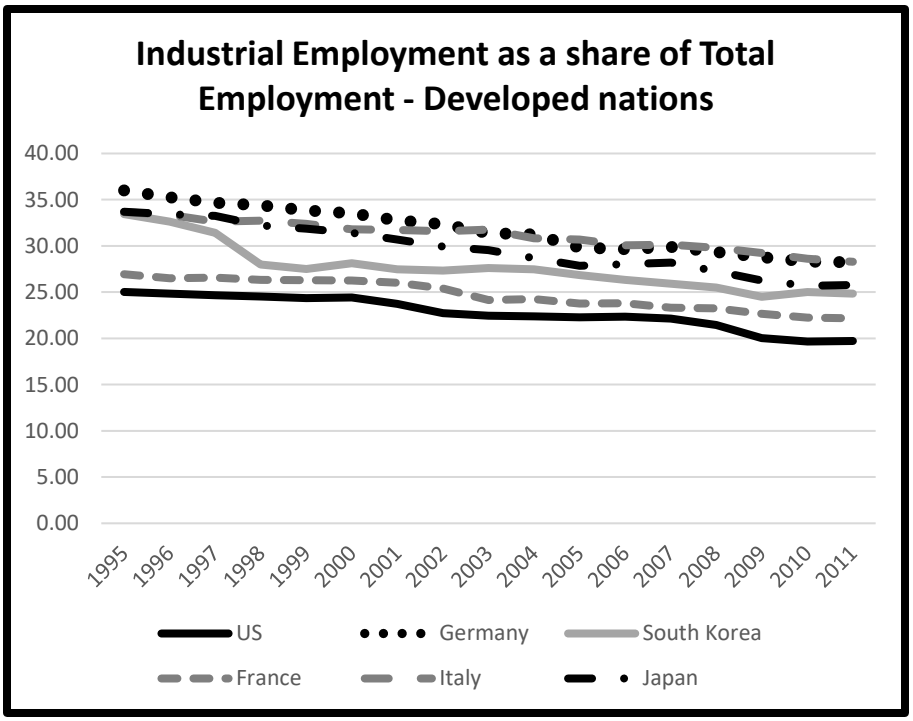


Figure 3.8. Industrial Employment as a share of Total Employment - Developed nations

Notes: Authors calculation using World Development Indicators (WDI) data. Graph shows the trend in industrial employment for select advanced nations over 17 years. Evidence points to de-industrialization at high levels of per capita income.

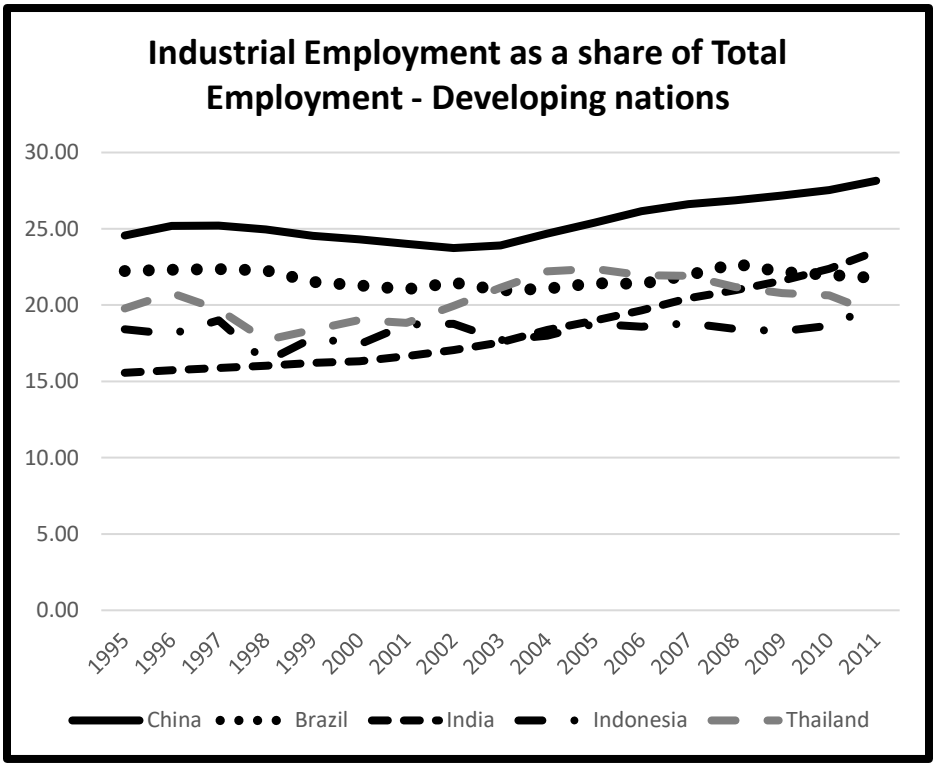


Figure 3.9. Industrial Employment as a share of Total Employment - Developing nations

Notes: Same as Figure 7 but for select emerging nations over 17 years. No clear trend of de-industrialization is evident in these countries, though Brazil and Thailand depict a slight declining trend starting 2008 and 2004 respectively.

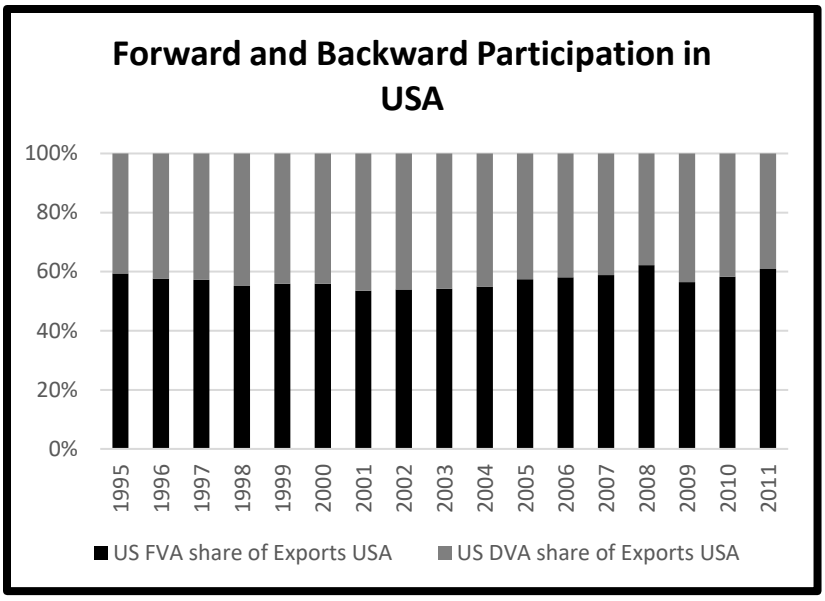


Figure 3.10. Forward and Backward Participation in USA

Notes: Same measures as in Figure 1 but for the case of US. Data shows quite a different trend compared to China. DVA in foreign exports of the US has remained around the average of 40% throughout the sample time period compared to around 20% in China. US firms are situated at higher nodes of the chain with strong core competencies leading to strong forward and backward inter-sectoral linkages. This also suggests a significant process of successful structural transition in such developed nations.

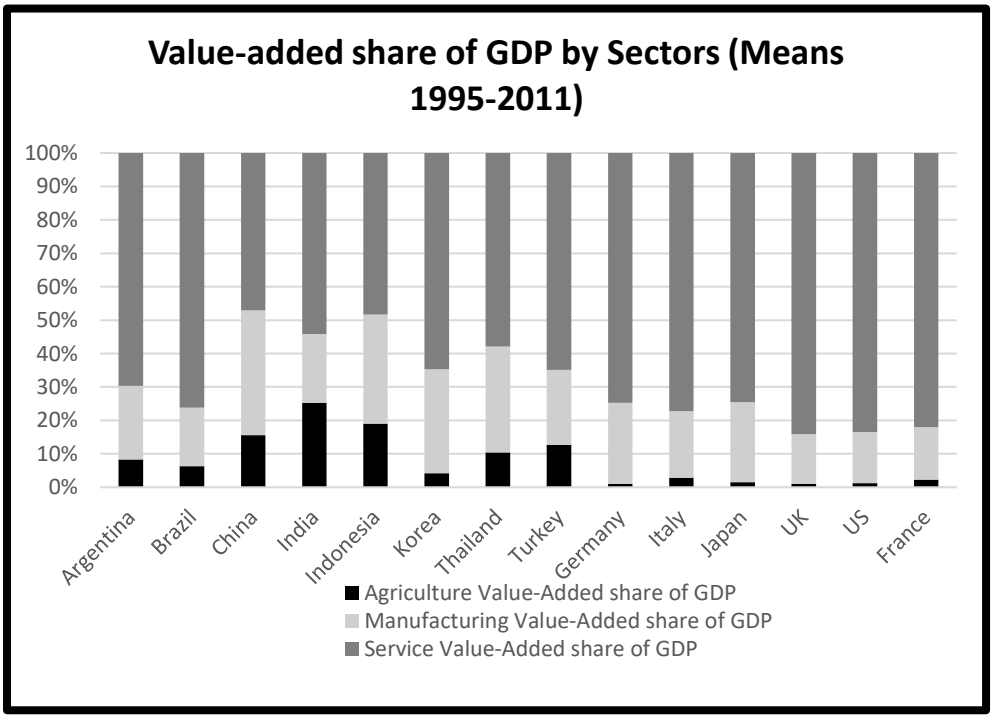


Figure 3.11. Value-added share of GDP by Sectors (Means 1995-2011)

Notes: Authors calculation using World Development Indicators (WDI) data. Values are means of agricultural, manufacturing and service sector value-added as a share of GDP over 17 years for each country. Agricultural share of value added in GDP remains larger for developing nations relative to developed ones. This suggests that structural transition remains constrained and labor and resources remain concentrated in low productivity agricultural tasks.

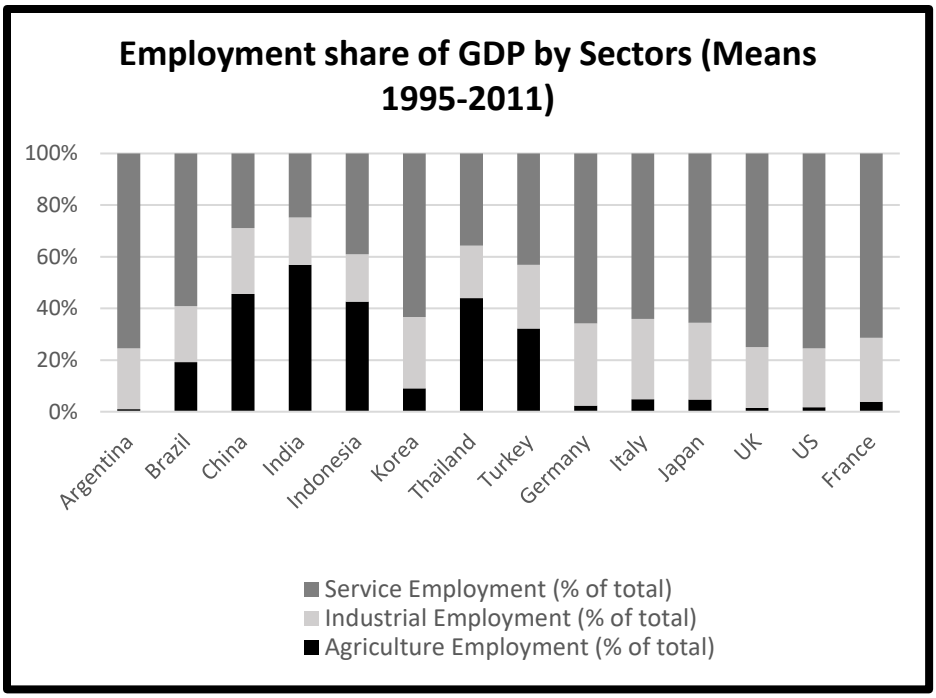


Figure 3.12. Employment share of GDP by Sectors (Means 1995-2011)

Notes: Authors calculation using World Development Indicators (WDI) data. These values represent sectoral employment shares as a percentage of total employment. Similar to Figure 11, higher agricultural employments in emerging nations affirms the evidence on constrained structural change.

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CHAPTER 1

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