Synopsis

Essays on Export Quality, Employment and Wage Inequality: Role of Trade, Fiscal and Monetary Policies

Dissertation submitted in partial fulfillment of the requirement for the Degree of Doctor of Philosophy in Arts of Jadavpur University

By

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1. Perspective and Motivation

In this Ph. D. Dissertation, I explore whether and how trade, fiscal and monetary policies incentivise quality upgrading of exports that are characterised by varying intensity of domestic factors like skilled labour and capital along with imported inputs to produce their higher quality varieties. I further study the implications of such export quality variations for the domestic labour market in terms of the effect on the level of aggregate employment of unskilled workers and/or wage inequality among skilled and unskilled workers. The issues are addressed theoretically in terms of a competitive general equilibrium framework of a small developing economy.

Trade theorists and empiricists have long debated on the success of the export-led-growth hypothesis ever since the time of Smith's (1776) vent for surplus productive capacity argument, and subsequent arguments of trade as an engine of growth (Robertson, 1940) and "net" exports augmenting effective demand and thereby output (Keynes (1936), Kalecki (1937)). A general consensus in this debate, however, has been that for exports to propel growth prospects for a country, its export basket must be aligned with the import demand of its trading partners. Furthermore, evidences emerging over the last two decades reveal that non-price dimensions, primary among them being the export-quality, are the key determinants of both better export performances and stronger export-led growth effects (Baldwin and Harrigan (2011), Bayudan-Dacuycuy and Lim (2014), Das and Bandyopadhyay (2003), Dongwen, Na, Xin, and Li (2016), Fan et. al. (2018), Fischer (2007), Galera and Fraga (2022), Gambero and Garcia-Ramos (2015), Hallak (2006), Hausmann and Klinger (2006), Hausman et al. (2007), Johnson (2012), Manova and Zhang (2012), Mukerji (2021), Rodrik (2006), Sutton (2001), and Verhoogen (2008)).

Earliest recognition of the role of product quality in deciding the direction and intensity of trade dates back to the Linder (1961) hypothesis. Subsequently, the New Trade Theories and the New Growth Theories developed during the 1980s and 1990s discussed

vertical specialization by developing and developed countries along the quality-spectrum of goods, and importance of quality and variety of imported intermediate goods in augmenting growth rates of counties (Bond (1984), Falvey and Kierzkowski (1987), Flam and Helpman (1987), Grossman and Helpman (1991), Romer (1987)). The quality dimension of the export-supply-import-demand misalignment problem for the developing countries emanates both from a shift in world demand towards high-quality goods, and low-quality phenomenon in the developing countries which is essentially a reflection of their comparative disadvantages in producing and exporting high-quality goods.

The demand-side argument for export-import misalignment constraining better export performances and stronger export-led growth impact for the developing countries is that with rise in income, both aggregate and per capita, consumers across the globe prefer to spend a larger proportion of their income on high quality products, even if they are high priced, rather than purchasing lower quality though cheaper varieties (Hallak, 2006). This changing world demand pattern also sets an altogether different perspective for export-promotion policies in the developing countries. Since export baskets of the developing countries consist mostly of low-quality goods – China, Brazil and India are no exceptions either despite their well-diversified export baskets – their export growth rates are severely constrained in the advanced richer countries (Baldwin and Harrigan (2011), Hallak (2006), Manova and Zhang (2012), Sutton (2001)). This is essentially the supply side of the quality-dimension of export-import misalignment constraining export performance and limiting the scope of the export-led growth for the developing countries. In such a context, export-promotion policies in the developing countries must target at improving quality of export goods rather than at making their low-quality exports cheaper. At the same time, as asymmetric quality variations across different product groups has been observed for a large number of developing countries (Acharyya and Ganguly (2023)), it may imply that the policy impacts may not be uniform across-the-board. This calls for designing targeted, or sector/product specific, export promotion policies that I shall elaborate upon in the core chapters of this dissertation.

There are several alternative explanations put forward for such low-export-quality phenomenon in developing countries. These explanations include fundamentals like

income disparity and low domestic demand for high quality goods in the developing countries (Fajgelbaum et al. (2011)); relatively poor technology of producing high-quality goods that translates into a comparative disadvantage in such goods for the developing countries (Flam and Helpman (1987), Matsuyama (2000)); scarcity of capital and/or skilled labour in the developing countries, which are more intensively used in producing the higher-quality varieties (Acharyya and Jones (2001), Falvey and Kierzkowski (1987), Murphy and Shleifer (1997)); and asymmetric information and related information externality (Bond (1984)).

Another explanation, which is directly relevant for trade policies affecting quality choices, is that poor-quality of indigenous inputs constrains quality-upgrading of final export goods. Thus, input trade liberalization induces quality upgrading (Bas and Strauss-Khan (2013), Hu, Parsely and Tan (2017), Fan and Li ([2013), Kugler and Verhoogen (2012)).

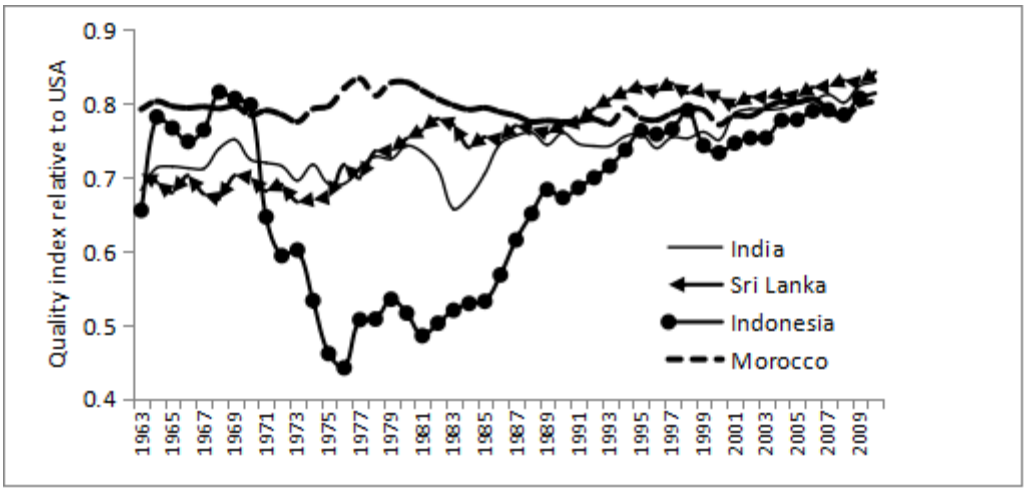
2. Export-Quality and Labour Market Implications: Literature Review

2.1 Evidence on export-quality and export performances

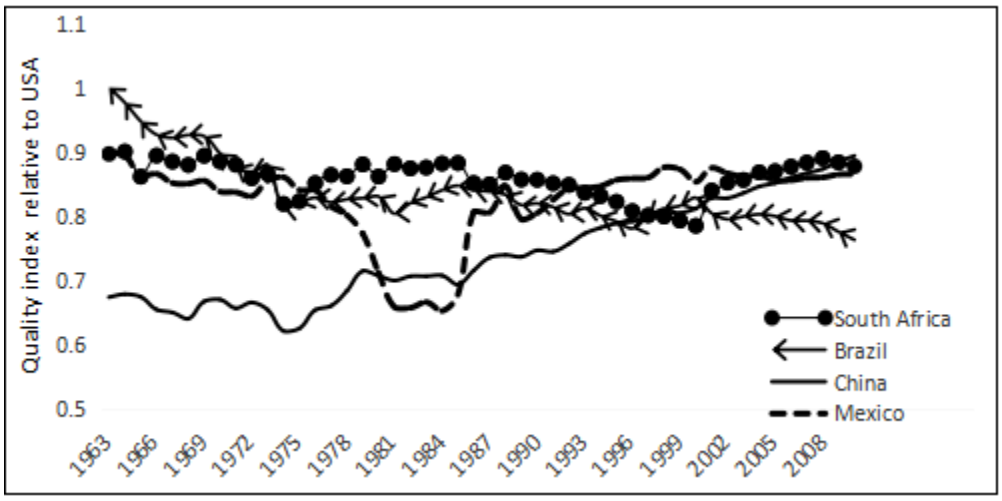
Among many studies, Hummels and Klenow (2005) used quantities exported and proxies for thenumber of varieties to argue that quality differences are necessary to explain to some extent the observed differences in unit values. Sutton (2001), on the other hand, showed that firms producing low-quality products cannot achieve high sales in global markets. More recent studies highlighting the quality-dimension for better export performance include Galera and Fraga (2022), AbdGhani, NikMat and Sulaiman (2019), Gambero and Garcia-Ramos (2015), Fan et. al. (2018), and Dongwen et. al (2016). There are also studies that focus on how quality relates to the performance of exporters using firm-level data, namely, Baldwin and Harrigan (2011), Hallak (2006), Johnson (2012), Manova and Zhang (2012), Rodrigue and Tan (2019). Growth rates are observed to be much higher for countries that export high-quality and high-technology intensive products than countries exporting low-quality products (Agosin (2007), Rodrik (2006), Hausman et al. (2007), Hesse (2008)). The supply side of the low-quality phenomenon has been substantiated by many studies (Schott (2004), Hummels and Klenow (2005),

Hallak and Schott (2011)). Schott (2004), for example, shows that unit value of exports increase systematically with exporter per capita income and relative endowments of physical and human capital. Feenstra and Romalis (2014) and Hallak and Schott (2011), using other methods, also report that higher-income countries export products inferred to be higher quality.

The quality estimates of Henn et al. (2014) provide more general and comprehensive evidence of poor quality of goods exported by most of the developing and poor countries. Drawing from this dataset, Acharyya and Ganguly (2023) makes some interesting observations in this regard. Figure 1, reproduced from their analysis, reflects upon the low-quality phenomenon in some selected developing countries in the middle income groups by comparing the export quality indices of their manufacturing goods with that of the United States for the period 1963-2010, whose average (aggregate) quality index always being among the top three during the entire period of the dataset (1962-2014). For the lower-middle income countries like India, Indonesia, Morocco and Sri Lanka as reported in panel (a), lower average quality of their manufacturing exports is evident. Lower average quality for the four upper middle-income countries – Brazil, China, Mexico and South Africa – is reported in panel (b). Quality of manufacturing goods produced by Brazil has deteriorated steadily. And a comparison with quality estimates reported in panel (a), by 2008 its average quality had fallen to the level of qualities produced by India, Indonesia and Sri Lanka. On the other hand, despite producing export goods of qualities lower than the United States, remarkable improvement has been achieved by China since early 1990s, catching up with South Africa by late 1990s and Mexico by 2005.



(a) Lower-Middle income



(b) Higher-Middle income

Figure 1: Quality indices of Manufacturing goods relative to that of the United States (1963-2010)
Source: Acharyya and Ganguly (2023)

Apart from these non-monotonic movements in average quality, the data also reveals asymmetric variations in quality across some export product groups for some of the developing countries. In case of India, trends in asymmetric quality variations have been observed to be more pronounced after the mid-1980s that marks the beginning of its liberalization of import of capital and intermediate goods as documented in the main thesis.

2.2 Low Quality phenomenon in developing countries

As surveyed in Acharyya (2005), and more recently in Acharyya and Ganguly (2023), major stumbling blocks that the developing countries face for upgrading their export-qualities range from backward technologies and low rates of innovation that keep marginal costs of improving quality high, to the problem of low domestic demand for higher quality varieties due to persistently low per capita income and uneven distribution of income in favour of a handful of rich. A large number of studies have looked at how these fundamentals explain the low quality phenomenon observed in the developing countrie (Bond (1984), Flam and Helpman (1987), Falvey and Kierzkowski (1987), Stokey (1991), Murphy and Shleifer (1997), Matsuyama (2000), Acharyya and Jones (2001), Acharyya (2005), Fajgelbaum et al. (2011), Ganguly and Acharyya (2021)).Asymmetric information of foreign buyers regarding quality of the goods imported from low income developing countries and thus their willingness to pay being limited by their perception of average quality based on country-of-origin also acts as a disincentive for producing high quality export goods. Apart from these fundamentals, restrictive trade and exchange rate policies create further disincentives for firms in the developing countries to produce high quality export goods. This is quite apparent in the context of a large literature that have stressed that export quality upgrading requires larger import of high-quality inputs. In such instances, tariff and non-tariff barriers, which had been prevalent at significantly high levels in developing countries until recently, raise the cost of producing higher quality goods. Over-valued exchange rates also raise the domestic-currency costs of imported inputs. Many recent analyses use this link between high quality imported input and high quality of export goods using variants of firm heterogeneity model a la Melitz (2003) and Bernard et al. (2003) to explore how devaluation (and input trade liberalization) induces quality upgrading (Atkin et al. (2017), Bas and Paunov (2021), Bas and Strauss-Khan (2013), Fan and Li (2013), Fieler et al. (2018), Hallak and Sivadasan (2013), Hu, Parsely and Tan (2017), Kugler and Verhoogen (2012), Manova and Zhang (2012) and Verhoogen (2008)).

2.3 Labour-market implications of better export-quality

Many researchers have recently argued that recent inequality trends all over the world are not related to the distribution of national income between the factors of production but primarily to the rising inequality of labour income due to skill premium or wage inequality (Francese and Mulas-Granados (2015), Acemoglu and Robinson (2015), Mare (2016), Dabla-Norris et al. (2015), ECLAC (2012), Greenwood et al. (2012)). A vast literature has been developed over the last three decades that emphasizes upon and demonstrates that significant and sustained episodes of trade liberalization across the globe during the 1980s and thereafter as one of the reasons for such global increase in wage inequality (Acharyya (2012), Aizenman, Lee and Park (2012), Chakraborty and Sarkar (2010), Davis (1996), Feenstra and Hanson (1996), Leamer (1995, 2000), Marjit and Acharyya (2003), Marjit and Kar (2005), Marjit, Pant and Huria (2019), Pi and Zhang (2017), Roy and Sinha Roy (2017), Ruffin (2003, 2009), Wood (1997), Yabuuchi and Chaudhuri (2008), Zhu and Trefler (2001)). Among the many channels through which trade accentuates wage-inequality in the developing countries that these analyses talk about, segmented labour markets – co-existence of formal and informal markets – is a significant and relevant one (Bogliaccini (2013), Brady et al. (2011), Marjit (2000, 2003), Marjit and Kar (2011), Marjit et al. (2007)).

On the other hand, employment effects of different export promotion policies have been analyzed in the existing literature mostly in an open economy macro-economy framework studying how policies augment effective demand for aggregate output and consequently aggregate demand for (unskilled) labour. Employment effects of currency devaluation in this context, has been studied by Alexander (1952), Cooper (1971a, 1971b), Dornbusch (1980), Hanson (1983), Krugman and Taylor (1976) and Meade (1951) among others. Among the multi-sector general equilibrium analyses, Brecher (1974) demonstrated that in a standard two-sector model of trade with minimum *real wage* restriction, trade liberalization raises aggregate employment if the trade pattern is Heckscher-Ohlin. Helpman (1977), on the other hand, considered a short run model of an economy producing traded and non-traded goods with sectorally mobile labour but sector-specific capital, and showed that under the assumption of downward rigidity of

real wage, currency devaluation would raise aggregate employment of labour unambiguously.

In such contexts, the policy-target of making the country's exports more quality-competitive may come in conflict with a major challenge of improving absolute as well as relative positions of low-skilled and unskilled workers and the poor through trade-induced growth. If higher qualities require more intensive use of capital and/or skilled labour, the scarcity of such factors may imply a trade-off between production of skill-based quality differentiated export goods and unskilled-labour produced other traded and non-traded goods. The consequent fall in the relative demand for unskilled workers causes job losses. The displaced workers, however, may not be absorbed elsewhere if unemployment already exists due to rigidity of wages. Thus, export-quality upgrading may increase the pool of unemployed in the short run. Informal sectors, a typical feature of developing countries, may absorb a part of the displaced workers but only for a significant drop in the informal wage. This in turn accentuates wage inequality not only between skilled and unskilled workers, but also among the skilled workers themselves. In such cases, quality-upgrading export-promotion policies may be difficult to sustain in democracies since adverse labour market implications increases the potential political risk. The vast existing literature, however, does not shed any light on this potential policy trade-off.

3. Research Objectives

From the review of existing literature of trade policy and export-quality emerges several research gaps and limitations of existing analyses to explain the low-quality phenomenon in the developing countries. First, though better quality of imported input may certainly be important as emphasized upon by Bas and Strauss-Khan (2013), Hu, Parsely and Tan (2017), Fan and Li (2013), Kugler and Verhoogen (2012), it cannot explain the observed asymmetric movements in quality indices of different export product groups. If higher qualities are contingent only on the intensive use of imported inputs, then reductions in tariffs on such inputs should unambiguously improve the quality of export goods across the board regardless of their import intensities. But, neither the non-monotonic movements in average quality of manufactured goods over time, nor the quality

variations across different product groups – as documented in Ganguly and Acharyya (2021) and Acharyya and Ganguly (2023), and reported later in this Chapter – corroborate that. In fact, the recent evidence does reveals the importance of the availability of specific skills and of capital and consequent domestic factor costs for quality choices by the exporting firms (Schott (2004), Brambilla et al. (2012), Brambilla et al. (2014), Brambilla and Porto (2016)). Since the standard trade theory (such as the Stolper-Samuelson theorem and its subsequent generalizations) suggests that trade policies asymmetrically change the skilled wage and the rate of return to capital, so depending on the relative skill-intensity of higher quality varieties, they may raise or lower the marginal cost of quality and accordingly either lower or raise the product quality. So I *re-examine trade policy impacts on export-quality when quality upgrading requires intensive use of domestic factors like skilled labour and capital* with such intensities varying across different product groups. To the best of my knowledge, theoretical explanations for the observed asymmetric quality variations across export product groups that vary in their relative intensities of domestic factors (skill and capital) required for quality upgrading, are largely lacking in the existing trade literature.

The *second relevant issue that has not been explored in the literature on export-quality promotion policies is the role of fiscal policy or government expenditure on infrastructure development for upgrading export-quality by taking into account both the skilled-labour augmenting effect and cost-cascading effect of better infrastructure.* Since better infrastructure – both hard infrastructure and soft infrastructure – can augment productivity of skilled workers, it can thereby improve quality of export-goods and thereby promote exports at the extensive margin. The highlighting feature of this research question is that since development of infrastructure competes for the same scarce resources that are used for production of other traded and non-traded goods and services in the economy, it raises domestic factor costs, which may adversely affect the choice of export qualities which the existing literature does not take into account. There is a sizeable empirical literature that examines the role of improved port efficiency, larger length of paved roads, and better telecommunication facilities on price competitiveness of exports and thereby gains at the intensive margin (Calderon and Severn (2005), Égert, Koźluk and Sutherland (2009), Esfahani and Ramirez (2002), Fernald (1999), Ismail and

Mahyideen (2015), and Xing (2017)). But none of these analyses, to best of my knowledge, examines how better infrastructure promotes exports at the extensive margin.

The third aspect of the present dissertation is in regard to examining whether a monetary policy can favourably affect export-quality choice by the domestic producers in a developing country. This issue assumes relevance due to two reasons. First is the fact that the exchange rate changes studied in literature (Yu (2013), Chen and Juvenal (2016), Hu, Parsely and Tan (2017)) are not exogenous but rather are the "managed" outcomes of monetary policies. That is, under a managed float exchange rate regime, which is being widely adopted by countries across the globe, ta more appropriate focus of analysis should be to look at the effects of exchange rate changes on the quality of exports as the consequences of monetary policies pursued by the central banks of the developing countries. Second, monetary policies can also affect export-quality by changing domestic factor prices through capital formation and consequent change in the composition of aggregate output due to scarcity of some commonly used resources. However, to what extent an expansionary monetary policy will generate general-equilibrium effects on the export-quality through changes in the domestic factor costs due to the output-composition effect remain unexplored in the literature. Thus, *examination of the role of monetary policy for export-quality is a much broader research question than what the existing literature on the exchange rate and export-quality addresses, and this constitutes the third major research question that I address in this dissertation*.

Fourth major research question that I address is whether export-promotion trade, fiscal and monetary policies accentuate the wage inequality between skilled and unskilled workers; *or, whether these policies lower the aggregate level of employment of the unskilled workers when unskilled money wage is rigid everywhere in the economy.* This issue assumes relevance since governments in large democracies may find it difficult to pursue export-promotion policies that have adverse income-distribution (and employment) effects and consequently cause conflicts and political risks there from. Moreover, to the extent to which quality variations per se accentuate wage inequality, the existing literature on effects of trade, fiscal or monetary policies on wage inequality will be an underestimation if quality variations induced by it are not considered. Ma and Dei

(2009) have analyzed the implications of quality upgrading on wage inequality extending the analysis of Acharyya and Jones (2001). But, in contrast to their study of implications of quality upgrading of a domestically produced non-traded good, my focal point is quality-differentiated export goods. Analyzing wage inequality among unskilled workers through informalization in the context of segmented labour markets is another major point of departure of the present analysis from that of Ma and Dei (2009).

As a further motivation of my theoretical analysis, I have undertaken a preliminary empirical exercise to reflect upon the relative importance of these three key variables, that these policies impact upon: globalization index, infrastructure index, and real effective exchange rate. Using the quality dataset developed by Henn et al. (2013) as an IMF-DFID research collaboration, panel data of 103 countries for the period 1996-2010, I have run a fixed-effects static panel regression to estimate the significance and magnitude of effectiveness of the policy variables, *trade liberalization, exchange rate, and infrastructure index*, in determining the choice of product quality. This also provides a preliminary and more general cross-country evidence on such impacts on export performance in contrast to the existing country specific studies using firm-level data carried out for short periods of time and few product varieties. Controlling for other variables based on the determinants of product quality that the existing theoretical literature emphasizes upon, I find that all the core policy variables have significant influence on choice of export quality. Subsequent theoretical analyses in the core chapters will provide plausible explanations for these significant impacts. Of course, the static panel estimation may be biased due to endogeneity problem and possibility of omitted variables among others. However, notwithstanding these limitations, the baseline results give some preliminary reflections on the significance of the three target variables of interest and thus provide some empirical relevance and motivation for our theoretical analyses. The insights gained from theoretical analyses carried out in this dissertation regarding how the policies affect the choice of export-quality will enable me to set up appropriate specification of our dynamic panel regression analysis (such as, system GMM) to estimate the policy impacts on export quality in a more robust way in a future extension of this preliminary empirical analysis.

4. Outline of the Thesis

The dissertation comprises of three core chapters followed by a Conclusion chapter that summarizes the results obtained in the three core analyses andoutlines my future research agenda.

Chapter 2: Trade Liberalization, Export Quality and Wage Inequality

In this Chapter, I have focused on the *domestic-factor* cost effects of tariff liberalization policies and its joint role with the imported-input to show that tariff reductions *may* adversely affect export-qualities. This is the central result of the benchmark analysis in terms of the four-sector general equilibrium framework of a small open economy with two quality-differentiated export products that differ from each other with respect to the relative domestic-factor intensities for their respective higher qualities. Given such asymmetric quality-effects of reduction of tariff, I examined how concurrent policies like a quality-content production subsidy, and input-subsidy for use of capital and/or skilled labour can effectively target to upgrade quality for those export-product groups whose quality is downgraded on account of tariff cuts. A quality-neutral income tax levied on income earners, except unskilled workers, can be a way to finance these subsidies.I have also exploredthe implications of such tariff-reduction induced asymmetric export-quality variations for wage inequality among skilled and unskilled workers, as well as among the unskilled workers themselves, by taking into account formal-informal segmentation of the labour market. Quality variations are found to accentuate wage inequality through informalization and consequent decline in the informal unskilled wage thus posing a policy dilemma for policymakers to sustain quality-upgrading export-promotion policies.

The robustness of the production structure is considered by allowing the same and mobile capital used in both the formal and informal sectors of production, instead of capital and land being specific factors in these two sectors. While the effect on export quality levels remain the same, the initial equilibrium level of quality now plays an important role in determining if tariff reduction widens wage inequality. Further extension of the benchmark production structure allow for sector-specific imported inputs used in producing the two quality-differentiated export goods. In such a context, I have

demonstrated that reduction of tariffs on these inputs generate similar asymmetric quality variations as does the reduction of tariff on a final import good. Finally, I have brought out the role of domestic demand by considering production of a non-traded good. The effects on the level of export-quality and wage inequality now depend on the value of price elasticity of demand for the non-traded good.

Chapter 3: Infrastructure Development, Export Quality and Labour Market Implications

In this chapter, I have demonstrated that higher quality of the ICT infrastructure improves quality of an ITeS exports if its skilled-labour productivity improvement is larger than its skilled-wage increasing effect. This brings out the fact that in a resource constrained economy, if the production of goods and infrastructure development compete for some common scarce resources, then infrastructure development has a factor-cost cascading effect which, if large enough, may cause export-quality to degrade. This cost-cascading effect even leads to a trade-off between different types of infrastructure projects. This has been studied in the context of ICT infrastructure used in ITeS exports and quality of ICT augmenting productivity of skilled workers there, on the one hand; and better and paved roads facilitating movement of unskilled workers employed in traditional production sectors and skilled workers engaged in producing a quality-differentiated manufactured export good and thereby improving their productivities, on the other hand. Due to the factor-cost cascading effect, a ceteris paribus increase in the budget provision for road development, or a reallocation of a fixed budget in favour of road development, lowers the quality of the ICT infrastructure and service provided by the government. Consequently, the quality of ITeS exports may be degraded by the service providers. On the other hand, a ceteris paribus increase in the budget provision for ICT infrastructure, or a reallocation of a fixed budget in favour of it, worsens road infrastructure. This, by raising the capital-costs relative to the skilled wage cost, worsens the quality of the manufactured export good if its high-quality varieties are relatively capital intensive. Thus, even if ICT is not used in the quality-differentiated manufactured export good,

Chapter 4: Export Quality and Labour market under Managed Float: Role of Monetary Policies

In this chapter, I examine whether and how an expansionary monetary policy affects the quality of exports and its implications for the domestic labour market in the basic framework of earlier chapters with only one type of quality-differentiated export good, a homogeneous composite traded good and a homogeneous non-traded good, by incorporating a money market, a portfolio-choice by wealth-holders for liquid-cash, domestic assets and foreign assets, and commercial banks channelizing supply of loanable funds to potential investment-firms. An increase in the domestic money supply upgrades the export quality when higher quality varieties of the export good are relatively capital intensive, and downgrades the export quality otherwise. With regards to effect on wage inequality under flexible wages, an expansionary monetary policy changes the skilled and unskilled wages in the same direction. Thus, wage inequality may worsen or decline depending on whether labour cost share in the composite traded sector is larger than that in the quality differentiated export sector, which, in turn, depends on the initial level of export-quality.

Finally, in the context of the minimum wage law being implemented uniformly across all the sectors that employ unskilled labour (so that informal sectors do not exist), I have shown that effect of a rise in money supply again depends on the relative skilled labour intensity of higher quality varieties. The aggregate level of employment of unskilled workers, on the other hand, increases at the initial level of export quality as well as due to quality variations. I have also informally discussed how the benchmark analytical structure can be extended by incorporating transaction demand for money and imperfect substitutability of assets.

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