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## International Trade and Inequality

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## International Trade and Inequality

### Abstract

The impact of globalization on equality has become a serious concern for many countries. More evidence that challenges the theoretical prediction of positive impact of international trade on income distribution has increasingly become available recently. This paper addresses this subject, surveying the empirical findings on the impact of international trade on inequalities from various perspectives.

The survey reveals that an increase in trade openness by developing countries appears to have contributed to narrowing the development gap vis-à-vis developed countries, while its impacts on income gap between developing countries are not clear. The impacts of increased trade or trade liberalization on within-country inequalities are mixed. In some cases, trade liberalization improved wage-inequality, but in some other cases, the opposite pattern was observed. Similar mixed patterns are found for regional inequalities. These mixed findings are consistent with the fact that theoretical predictions are also mixed. One reason for the mixed findings is the impact of other factors affecting inequalities, including labor market conditions, inflow of capital, and policy reforms.

Government needs to implement appropriate policies to deal with the inequalities. Two of the most important are policies to promote human resource development and policies on income redistribution. The former improves quality of labor, with the support from a well-functioning and flexible labor market. The latter covers policies on social safety net or on tax system. The safety net pays some portion of adjustment costs borne by workers who are adversely affected by the tax system (e.g., progressive and inheritance tax) helps distribute income more equally between the rich and the poor.

### Keywords

globalization, income inequality, international trade, development, labor market

### Comments

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**INTERNATIONAL TRADE  
AND INEQUALITY**

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**Abstract**

The impact of globalization on equality has become a serious concern for many countries. More evidence that challenges the theoretical prediction of positive impact of international trade on income distribution has increasingly become available recently. This paper addresses this subject, surveying the empirical findings on the impact of international trade on inequalities from various perspectives.

The survey reveals that an increase in trade openness by developing countries appears to have contributed to narrowing the development gap vis-à-vis developed countries, while its impacts on income gap between developing countries are not clear. The impacts of increased trade or trade liberalization on within-country inequalities are mixed. In some cases, trade liberalization improved wage-inequality, but in some other cases, the opposite pattern was observed. Similar mixed patterns are found for regional inequalities. These mixed findings are consistent with the fact that theoretical predictions are also mixed. One reason for the mixed findings is the impact of other factors affecting inequalities, including labor market conditions, inflow of capital, and policy reforms.

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**JEL Classification:** F14, F63, O15

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## 1. INTRODUCTION

Increasing inequality has been a very serious concern for many people including policy makers and researchers in the world. Thomas Piketty's book titled *Capital in the Twenty-First Century*,<sup>1</sup> which analyzes the growing asset inequality in developed countries, sold over 1.5 million copies (as of January 2015) throughout the world. One of the most contentious issues in the United States (US) Presidential election is the growing income gap between the rich and the poor. According to Saez (2015), the share of income held by the richest 1% of the population in total increased from 8.95% in 1978 to 21.24% in 2014 in the US.

Increasing inequality has been a serious issue in the developing countries as well. The People's Republic of the China (PRC) and India, two rapidly growing giant economies, have been reported to experience substantial increases in inequality. In terms of economic growth, the PRC and India have been regarded as successful cases, but in terms of quality of economic growth they appear to suffer from various problems such as growing inequality and environmental problems. It is not only the PRC and India that are faced with growing inequality but other developing countries as well.

Achieving equitable and balanced growth is important for the people, society, and government. Growing inequality would lead to social unrest and political instability, which in turn would undermine economic growth. Indeed, recognizing the importance of reversing the trend of increasing inequality in developing countries, the United Nations has included reducing inequality as one of 17 sustainable development goals.<sup>2</sup>

While the world has been witnessing growing inequality in recent decades, it is also experiencing rapid globalization of economic activities through the means of international trade and international investment, particularly in the form of foreign direct investment (FDI). The share of trade (exports+imports) in gross domestic product (GDP) (trade–GDP ratio) for developing and developed countries increased more or less continuously from the late 1960s through 2014 (Figure 1). Specifically, the trade–GDP ratios for the developing and developed countries increased from 29.9 and 36.9% in 1980 to 51.3 and 45.7% in 2000, respectively, and then further to 55.2% and 55.3% in 2014. Major drivers of the increase in trade–GDP ratios include trade and FDI liberalization, and reduction in transportation costs by technological progress and deregulation in transportation services sectors.<sup>3</sup>

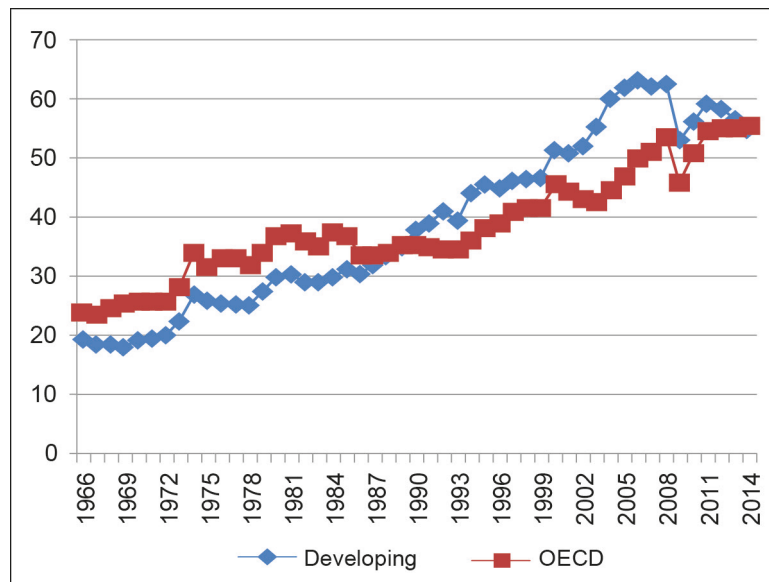
Growing inequality and rapid globalization have been observed in tandem, as such globalization has often been accused of worsening inequality. Indeed, anti-globalists, many of whom are concerned with growing inequality, have held a number of demonstrations against the meetings organized by the World Trade Organization, the World Bank, the International Monetary Fund, and other international organizations as well as developed countries such as G-7 Summits, which are considered to have promoted globalization.

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<sup>1</sup> Its original French version was published in 2013. The English translated version was published in 2014 (Piketty 2014).

<sup>2</sup> See the following UN website for the Sustainable Development Goals. <http://www.un.org/sustainabledevelopment/sustainable-development-goals/> (accessed 20 February 2017).

<sup>3</sup> See, for example, Hummels (2007) about the reduction in trade cost.

**Figure 1: Trade–GDP Ratios**

Source: Computed from the World Bank, World Development Indicators on line (accessed 16 April 2016).

In light of the discussions and observations above, the purpose of this paper is to examine the impacts of globalization, particularly in terms of international trade, on inequalities in developing countries.<sup>4</sup> Inequalities are found in many forms, which include income inequality, wage inequality, asset inequalities, regional inequalities, gender inequalities, generational inequalities, and others. We analyze the impacts of international trade on inequalities from the following perspectives.<sup>5</sup> In section 2 we examine the impacts of international trade from the global perspective. Specifically, we first analyze inequalities between developing and developed countries, and then global inequalities, which are measured as if the world is treated as one country or one entity. In section 3 we turn to within-country income inequality, while in section 4 we analyze wage inequality, which is a major component of income inequality, in depth. In section 5 regional inequalities within countries are examined. The final section, section 6, concludes the paper by summarizing the findings and providing several policy implications.

## 2. INEQUALITY FROM THE GLOBAL PERSPECTIVE

Inequality from the global perspective can be examined in several ways. One may compare an average per capita income of a country with that of another country, and examine if the gap has widened or narrowed over time. In this approach the unit of comparison is a country or a group of countries such as developing and developed countries. Another approach is to consider all the people in the world as individuals or world citizens and measure inequality among those individuals. The measured inequality may be considered as the global inequality. In this section both approaches are used to find out about inequality in the world. One may find that global inequality be

<sup>4</sup> For developing countries, consumption rather than income is a better indicator of measuring inequality because many households are engaged in self-employment and self-consumption, which are not captured by the statistics on income. But most studies use income or wage statistics rather than consumption statistics because of the limited availability of consumption data.

<sup>5</sup> See Goldberg and Pavcnik (2007) and Goldberg (2015) for a survey of the literature.



decomposed into cross-country equality, which will be investigated in section 2.1 and within-country inequality, which will be examined in section 3.

## 2.1 Inequality between Developing and Developed Countries

Inequality between the rich (developed) countries and the poor (developing) countries has been a contentious issue for many decades. International trade has been considered to play an important role in influencing this inequality. Some observers argue that developing countries are exploited by developed countries as developing countries are trapped in a trading system where developing countries export primary products such as natural resources to developed countries while developing countries import industrial products from developed countries. And the terms of trade of primary products vis-à-vis industrial products tend to worsen over time (Prebisch–Singer Hypothesis).<sup>6</sup> According to this view, trade widens inequality between the developed and developing countries.

However, there has been a totally opposing view, which argues that trade is an engine of economic growth,<sup>7</sup> thus trade can reduce the inequality between the developed and developing countries, if developing countries successfully expand trade. Expansion of exports enables the developing countries to earn foreign exchange, with which they can import raw materials, intermediate goods, capital goods, technology, and other items, which can be used to promote economic growth. Export expansion also enables exporting firms to gain benefits from economies of scale and improve productivity, thereby contributing to economic growth.

As seen in the above discussions, in theory the impacts of trade on economic growth can be positive and negative. In light of this observation, we review the empirical studies that examined the impacts of trade on economic growth with a focus on the relationship between developing and developed countries.

Dollar (2005) compares per capita GDP growth rates of the developing and developed countries from the 1960s through 1990s for about 100 countries using the data obtained from the Penn World Tables. He found that per capita growth rates gradually declined in developed countries while accelerating in developing countries. During the 1960s growth of OECD countries was about twice as fast as that of developing countries. During the 1970s and 1980s growth of developed countries declined significantly while growth of developing countries remained more or less at around the same level. The 1990s saw a dramatic increase in growth rate of the developing countries while growth rate of the developed countries continued to decline. Indeed, the growth rate of developing countries was twice as high as that of developed countries in the 1990s.

A similar pattern of the reversal of GDP per capita growth rates between developed and developing countries in the 1990s can be seen in Figure 2. The data are taken from the World Bank's World Development Indicators. After a substantial decline from the 1970s to the 1980s, GDP per capita growth rate of the developing countries began to increase in the 1990s and then it increased remarkably in the 2000s. By contrast, GDP per capita growth rate of the OECD countries declined continuously from the 1980s to 2014. Indeed, there is a wide divergence in the average annual GDP per capita growth rates for the 2000–2014 period between the developing countries at 4.5% and OECD countries at 0.9%. These developments of GDP per capita growth for

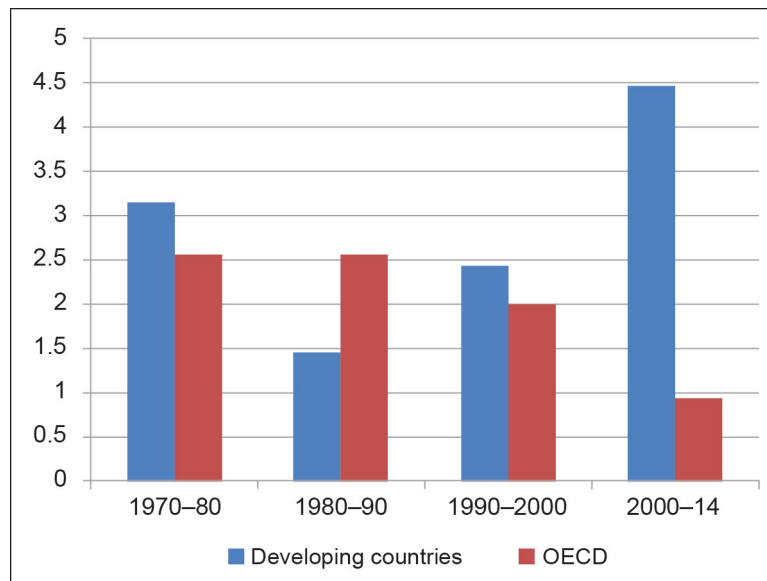
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<sup>6</sup> On the Prebisch–Singer hypothesis and its validity, see, for example, Harvey et al. (2010).

<sup>7</sup> See, for example, the World Bank (1993).

developing and developed countries resulted in the narrowing of the GDP per capita gap between them. GDP per capita of developed countries was 24 times as high as that of developing countries in 1970, but the gap declined to 15 times in 2014.

**Figure 2: GDP per Capita Growth Rates for Developed and Developing Countries**



Source: Computed from the World Bank, World Development Indicators on line (accessed 16 April 2016).

A comparison of per capita GDP growth of developing and developed countries revealed that inequality between them declined in recent decades, especially in the 2000s. Recognizing the increasing trend of trade-GDP ratio during the period shown in the previous section, one may argue that trade contributed to the rise in per capita GDP growth rates, particularly for the developing countries, thus contributing to the narrowing gap. The validity of this assertion has to be examined by conducting rigorous statistical analyses. A number of empirical studies have been conducted to examine the impacts of foreign trade on economic growth during the last 2 decades, but no conclusive evidence has been presented yet. We review several important studies on this subject below.<sup>8</sup>

<sup>8</sup> The issue of the impact of trade on economic growth has also been analyzed from the trade policy perspectives. For such studies, the main issue is whether trade liberalization promotes economic growth. There have been a large number of empirical studies on this issue. The results from growth regression analyses vary depending on the indicators of trade policy, types of regressions methods, periods of analysis, and others. Sachs and Warner (1995), which is one of the most influential papers on this issue, found that trade liberalization promoted economic growth. Wacziarg and Welch (2008) extended the Sachs and Warner study by dealing with criticisms and showed positive impacts of trade liberalization on economic growth. For critical discussions of the previous studies based on growth regressions, see, for example, Rodriguez and Rodrik (2001) and Rodriguez (2007), which did not find growth promoting effect of trade liberalization. Major criticisms include incorrect indicators of trade policy and inappropriate econometric treatment. Some opponents of growth regressions, which include Srinivasan and Bhagwati (1999), advocate country-level case studies. The result of country case studies such as Krueger (1978) in general support outward-orientation trade policy for achieving economic growth. It should be noted that the study of trade policy on economic growth and the study of trade openness (trade/GDP) on economic growth are closely related but their meaning is different. One obvious reason for the difference is that trade liberalization, say reduction in tariff rates, does not necessarily increase trade/GDP ratio because the tariff rate is only one factor among many such as the exchange rate that affect trade/GDP ratio.

A typical growth regression has growth rate in terms of per capita GDP as the dependent variable and it has its initial level and a wide variety of control variables including trade and investment as explanatory variables. One of the early studies was the World Bank (1993). Using the data covering 88 countries for 1960–85, they conducted a regression analysis of the determinants of real per capita GDP growth and found that trade–GDP ratio had a significantly positive impact. Many studies found significant positive correlations between per capita GDP growth rate and trade–GDP ratio.<sup>9</sup> However, several econometric problems concerning growth regression including the problems of endogeneity and correlated individual effects were pointed out.<sup>10</sup>

Several studies were undertaken that dealt with these problems. Frankel and Romer (1999) investigated the impact of international trade on per capita income by dealing with the endogeneity problem in that countries whose incomes are high for reasons other than trade may trade more. Analyzing the data from 150 countries for 1985 by using the instrumental variable estimation method, Frankel and Romer found that trade has a positive impact on income, although the estimated coefficient was moderately statistically significant. Dollar and Kraay (2004) conducted a regression analysis by adopting instrumental variables estimation to deal with endogeneity problem and by taking the differences of the variables to deal with the problem of correlated individual effects. In their analysis, the explanatory variables include lagged growth, changes in trade volumes, and changes in policy and non-policy variables affecting growth.<sup>11</sup> The results of the estimation analyzing the growth rates in the 1980s and the 1990s for roughly 100 countries found that the change in trade volume had a positive and significant impact on growth.

Despite several attempts to deal with the problems raised by the critics, these authors do not seem to be successful in dealing with the problems raised by the critics. Rodriguez (2007) reviewed some major studies including Dollar and Kraay (2004) and found that these studies did not deal with the problems successfully. Rodriguez asserts that one of the reasons why it is so hard to reach definitive conclusions regarding the trade–growth link is the complex web of interrelationships that is involved in the determination of a nation's income. Rodriguez pointed out geography and institutions, which would affect trade as well as economic growth. As such, these factors need to be considered in the regression analysis. Another issue that Rodriguez raised is the period of analysis. Using the more recent data covering the 1990–2003 period rather than the 1980s and 1990s as in the earlier studies, Rodriguez performed a first-difference regression analysis, similar to the approach adopted by Dollar and Kraay (2004). He also added more control variables such as those associated with institutions, and he found that trade/GDP ratio to be mostly positive but statistically insignificant.

A brief survey of the previous studies on the impacts of trade on economic growth revealed that the strong positive impacts found in early studies turned out to be not robust. The results of the survey are not encouraging for the proponents of trade promoting policies. There still remains a need for further analysis on the impacts of trade and economic growth. A recent study on the impacts of trade on poverty in Africa by Goff and Singh (2013) shows possible perspectives that need to be considered for discerning the impacts of trade on growth. Analyzing the panel data covering 30 African countries over the period 1981–2010, they found that impacts of trade on poverty were negative, meaning that trade increases poverty, but trade is found to reduce poverty in countries where financial sectors are deep, education levels are high, and governance

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<sup>9</sup> See Winters (2004) for a survey.

<sup>10</sup> See Caselli, Esquivel and Lefort (1996) on these points.

<sup>11</sup> Specifically, institutional quality government consumption, monetary policy, and political stability.

is strong. These findings point to the need for accompanying policies/institutions to trade promoting policies, to achieve economic growth. With these policies, reallocation of resources from less productive sectors to more promising sectors will be enhanced, to result in economic growth

Although the previous empirical studies analyzing macroeconomic variables have shown mixed results of the impacts of trade on economic growth, various reasons for possible positive impacts have been pointed out in the discussions on this issue. One of the most important reasons is productivity enhancing effects of trade, i.e., exports and imports. This relationship was detected in earlier studies using macro as well as sectoral data but the lack of appropriate theory and necessary data precluded researchers from establishing the causal relationships empirically.<sup>12</sup> It was the advent of the heterogeneous firm and trade model, developed by Melitz (2003), and availability of firm-level data, that enabled researchers to discern how aggregate economy is affected by an expansion in trade and/or trade liberalization. Several studies have found that exporting resulted in an improvement in productivity of exporting firms, or the presence of the “learning by exporting” effect.<sup>13</sup> The sources of productivity enhancing effect of exporting firms may include economies of scale and acquisition of advanced technology in foreign market, which may be obtained by exporting. Increased imports are found to contribute to increase productivity of local firms. Amiti and Konings (2007) argued that trade liberalization in Indonesia raised productivity of local firms as it enabled local firms to use a greater variety of imported intermediate inputs. We will come back to this issue, when we discuss wage inequality.

## 2.2 Global Inequality

In section 2.1 we saw that inequality between the developing and developed countries in terms of per capita GDP narrowed in recent decades. In this section we examine how global inequality changed in recent decades and examine the impact of globalization on global inequality. According to Bourguignon and Morrisson (2002), global inequality rose from 1820 to 1980 as their estimates of the global Gini coefficient increased from 50 to 65 during the 1820–1980 period. For the period after the 1980s, various estimates have been made with mixed results in terms of the direction of the change. Bhalla (2002) estimated the global Gini coefficient and found that it declined from 67 in 1980 to 64 in 2000. Sala-i-Martin (2002) also found a decline. By contrast, Bourguignon and Morrisson find the Gini coefficient to remain at 65.7 in 1980 and 1992, while Milanovic (2002) finds an increase of about 3 Gini points from 62.5 in 1988 to 65.9 in 1993, which is followed by a decline of 1 Gini point in the next 5 years and by an increase of 1 point by 2002.<sup>14</sup> Based on these calculations, Milanovic observed zig-zags in Gini coefficient from the 1980s to 2002. Bourguignon (2016) reports that global inequality declined after 2000. These observations show that global inequality worsened from the 19th century to around 1980, but it remained about the same level or improved from the 1980s through around 2010.

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<sup>12</sup> For example, see Alcalá and Ciccone (2004).

<sup>13</sup> The studies that detected “learning by exporting” effect include, for example, Aw et al. (2000), Girma et al. (2004), De Loecker (2007), and Hahn and Park (2010).

<sup>14</sup> This calculation is reported in Milanovic (2006).

The impact of globalization on global inequality may be analyzed by decomposing global inequality into two components—inequality in mean incomes between poor and rich countries, and within-national income distributions. If globalization, say an increase in trade–GDP ratio, reduces the gap in mean income between poor and rich countries and it reduces within-national income distributions, then global inequality is likely to be reduced. A casual comparison between the rich and poor countries in terms of changes in per capita GDP (Figure 2) and the changes in trade–GDP ratios (Figure 1), show that per capita GDP growth was accompanied by globalization. Coupled with the observation in the next section that the impacts of globalization on within-national income distribution are mixed, one is tempted to argue that globalization contributed to narrowing global inequality. However, this assertion cannot be supported if one remembers that in section 2.1 the earliest studies have shown that the impacts of globalization on economic growth are mixed. These observations and discussions indicate that the impact of globalization on global inequality cannot be conclusively determined. More studies on these two issues need to be conducted to see if and how globalization affected global equality/inequality.

### 3. WITHIN-COUNTRY INCOME INEQUALITY

Many studies have found that within-country inequality increased in both developed and developing countries in recent decades.<sup>15</sup> Before we examine if globalization, particularly in terms of international trade, has contributed to the increase in inequality, we make an observation on the changes in trade–GDP ratios and Gini coefficient for selected East Asian developing countries from the 1980s to 2012. It should be noted that the Gini coefficient is available for a limited number of countries for certain years, making it difficult to conduct cross-country, time-series comparisons.

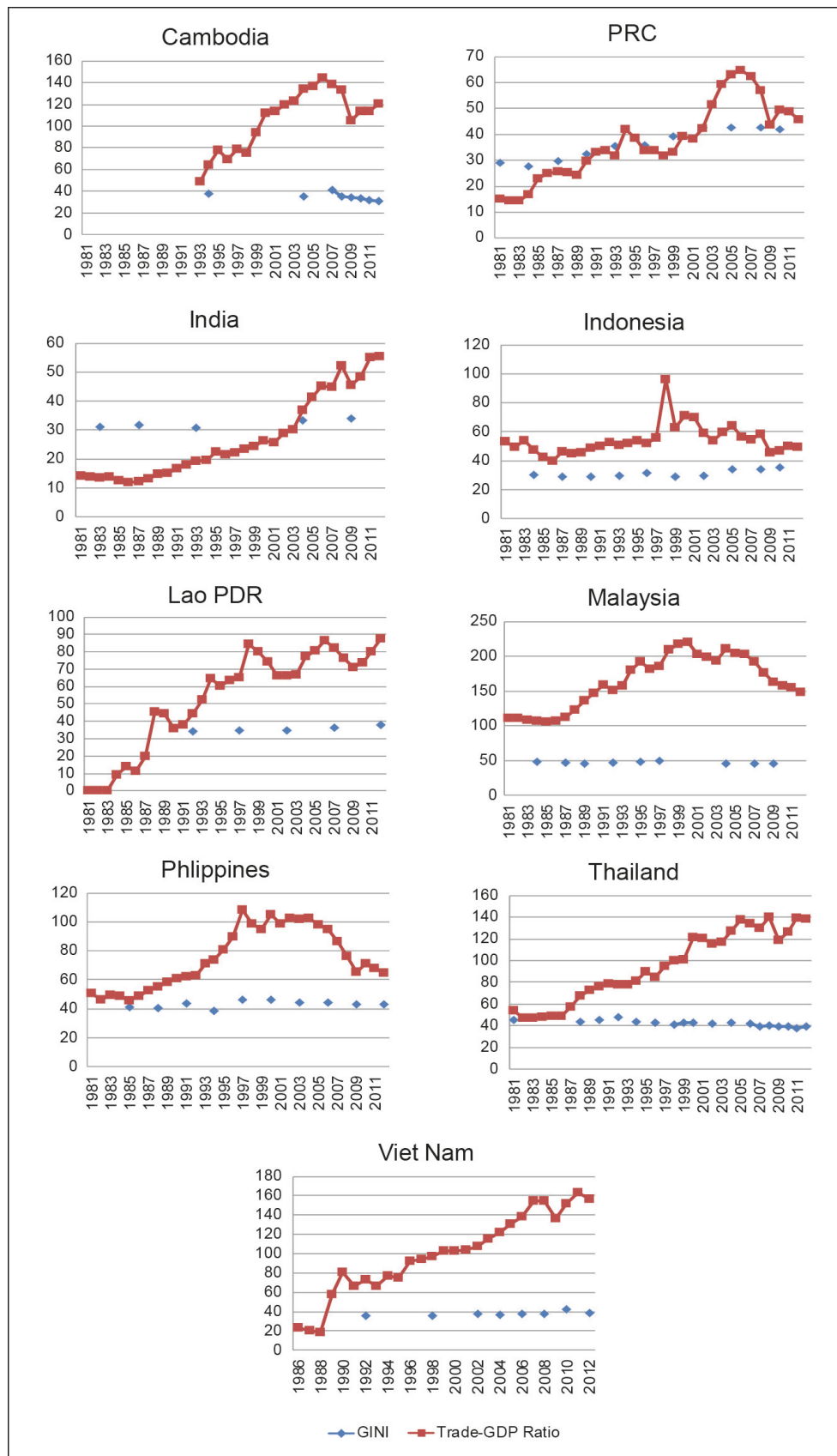
Figure 3 shows the trade–GDP ratios and Gini coefficients for nine East Asian countries, for which both are readily available. Concerning the trend in the trade–GDP ratios, all the countries in the figure showed substantial and continuous increase through the end of 1990s although many countries experienced a decline toward the end of the 1990s because of the Asian Financial crisis. Entering the 21st century, two divergent trends appeared. One group of countries including Cambodia, the PRC, India, Lao PDR, Thailand, and Viet Nam continued to increase the trade–GDP ratios, while the other group consisting of Indonesia, Malaysia, and the Philippines experienced a reversal in the trend and recorded a decline in the trade–GDP ratios.

Turning to the Gini coefficient, we find that the PRC is the only country that exhibited a more or less continuous and substantial increase from the early 1980s to 2010, as the index increased sharply from 27.69 in 1984 to 42.06 in 2010. India, Indonesia, and Viet Nam showed an upward trend in the 21st century after experiencing a relatively stable trend. By contrast, Cambodia, Malaysia, the Philippines, and Thailand showed a downward trend in the 21st century after experiencing a slight upward trend. These casual observations appear to find the strong positive correlation between trade–GDP ratio and inequality only in the case of the PRC. For other countries, such relationship cannot be found for the entire period of examination, although such relationship can be detected for certain sub-periods.

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<sup>15</sup> Jaumotte et al. (2013) provides the information from the 1980s to around 2003. See also Goldberg and Pavcnik (2007) for the cases of several developing countries.

**Figure 3: Trade–GDP Ratios and Gini Index for Selected East Asian Countries**



Source: Computed from the World Bank, World Development Indicators on line (accessed 16 April 2016).

A large number of studies have addressed the issue related to the impact of globalization on within-country income inequality for various countries. Most of these studies examined the impact on wage inequality rather than income inequality<sup>16</sup>. Wage inequality is closely related to income inequality, because wage is a dominant part of income for many workers. However, they are different because many people receive unearned income such as profits from investments. There are relatively few studies that examine the relationship between globalization and within-country income inequality at the level of country as a whole for individual countries. Several cross-country econometric studies have been conducted, as will be discussed below.

One useful theoretical framework that may be applied to explain the relationship between trade and income distribution is the Stolper–Samuelson theorem derived from the Heckscher–Ohlin (HO) trade model. According to the Stolper–Samuelson theorem, trade liberalization leads to an increase in the price of abundant factors relative to the price of scarce factors because it expands the production and exports of abundant factor-intensive products and it reduces the production of scarce factor-intensive products as a result of an increase in imports of scarce factor-intensive products. Let us assume that there are two types of labor—skilled and unskilled labor—and developing countries are abundantly endowed with unskilled labor. Under such circumstance, trade liberalization by developing countries will expand exports of unskilled labor intensive products and imports of skilled labor intensive products, which in turn increases demand for unskilled labor and reduces demand for skilled labor. Assuming that labor's income comes from wages, one could show that an expansion of foreign trade would improve income distribution in developing countries as it would increase the wage of unskilled workers while it would reduce the wage of skilled workers<sup>17</sup>.

We review the existing studies on the impacts of globalization on within-country income inequality. Two types of studies have been conducted. One is a country-level study and the other is a cross-country study. Country-level study is conducted by analyzing the trends of various variables including income distribution, globalization, employment, development policies, and others, while cross-country analysis uses statistical methods. Let us begin with country-level studies and then turn to cross-country studies.

Goldberg and Pavcnik (2007) analyze the impacts of globalization on within-country inequality in developing countries covering the period from the 1980s to around 2000. For the countries analyzed by Goldberg and Pavcnik, that is, Argentina; Brazil; Chile; Colombia; Hong Kong, China; India; and Mexico, the share of trade to GDP increased and income inequality measured by Gini coefficient was either stable or increased during the 1980s and 1990s. These developments are not consistent with the prediction of the Stolper–Samuelson theorem discussed above. Noting the difficulty in establishing a causal link between expanded trade and growing inequality, partly because of the difficulty in considering other factors such as the changes in macroeconomic environment, adoption of various policy reforms other than trade policy, Goldberg and Pavcnik conclude that evidence has provided little support for the conventional wisdom (Stolper–Samuelson Theorem) that trade openness in developing countries would favor the less fortunate (at least in relative terms)<sup>18</sup>. According to Goldberg and Pavcnik, one of the important factors that played a role for the lack of support of the conventional wisdom is constrained labor mobility that limited sectoral reallocation of labor. They also argue that the particular mechanisms through which

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<sup>16</sup> See section 4 for the discussions on globalization and wage inequality.

<sup>17</sup> Detailed discussions on wage inequality will be presented in section 4.

<sup>18</sup> Goldberg and Pavcnik (2007: 77).

trade affects income distribution are country, time, and case specific, implying the need for case studies.

Mah (2013) analyzed the impact of globalization on income inequality in the PRC. Globalization is captured by the trade–GDP ratio and FDI inflows–GDP ratio, while income inequality is measured by two ratios—one is the ratio defined as the average income of the top 10% divided by that of the bottom 10%, and the other is the ratio defined as the average income of the top 10% divided by that of the bottom 40%. Applying the dynamic ordinary least squares method to the time-series data covering 1985–2007, Mah found that increase in trade–GDP ratio had a strong positive effect on income inequality regardless of the measure of income inequality, while the effect of FDI inflows was found to be mixed. These findings appear consistent with the casual observation made earlier, showing the rising trend of trade–GDP ratio and increasing inequality in the PRC.

Pal and Ghosh (2007) analyzed the trend of income and consumption inequality from the 1980s to early 2000s in India. Noting the mixed evidence on the direction of change in income inequality during the 1990s, the period of economic reform, which was obtained from various studies, they presented the studies conducted by other researchers that showed an increasing inequality in terms of expenditure and consumption during the reform period. Pal and Ghosh argue without conducting a statistical analysis that fiscal policy, financial sector reform, liberalization of foreign and domestic investment, and trade liberalization all contributed to increasing inequality, as they favored the allocation of fiscal as well as financial resources from the poor to the rich. Specifically on the impact of trade liberalization, they argue that trade liberalization had negative impacts on the agricultural sector, which employs low-income workers, while it only benefited a small portion of the manufacturing sector, resulting in growing inequality.

All the studies we surveyed above did not support the prediction of the Stolper–Samuelson Theorem. The findings of Ragayah (2008) on the case of Malaysia are different. Ragayah (2008) found that income inequality declined during the 1976–1990 period, but it increased after 1990. Ragayah argues that differences in the pattern of exports between these two periods played an important role in its impacts on income inequality. Rapid growth during 1976–1990s was largely attributable to rapid expansion of labor-intensive exports, which provided employment opportunity for many people, thereby contributing to the decline in income inequality. The situation changed as a labor shortage situation emerged in the 1990s. In order to maintain its competitiveness in the global market, Malaysia upgraded her industrialization development from one that is labor-intensive to one which is capital- and technology-intensive. Consequently, this new development strategy altered the pattern of demand for labor required by the industries by raising the demand for skilled and highly educated workers, resulting in increasing income inequality. This trend was enhanced by the massive entry of unskilled foreign labor into the Malaysian economy that dampened the wages of unskilled labor. Ragayah's findings are very interesting and consistent with the Stolper–Samuleson Theorem in that globalization reduced income inequality when Malaysia was a low-income developing country, while globalization worsened income inequality when Malaysia became a middle-income country.



Let us turn to the cross-country analysis. Anderson (2005) provides a review of cross-country econometric studies of the effect of openness on within-country inequality.<sup>19</sup> The studies that Anderson reviewed covered the period up to the mid-1990s. Specifically, he examined the results of the studies that statistically tested the validity of the following three hypotheses: (1) greater openness raises overall inequality in all countries; (2) greater openness reduces overall inequality in developing countries, but increases overall inequality in developed countries; (3) the effects of greater openness on overall inequality vary, depending on the factor endowments of the country opening up. Reviewing the studies, Anderson came up with the following broad conclusions on the three hypotheses. There is almost no support for the first hypothesis, while there is conflicting evidence regarding the second hypothesis. Some studies find that greater openness does reduce inequality in developing countries, but some studies found no significant effect of openness on inequality at any level of economic development. There is qualified support for the third hypothesis. Specifically, some studies find that the effect of openness on inequality increases as countries' endowments of human capital increases. This finding appears to indicate that openness increases inequality as the level of economic development of the country rises and it is consistent with the finding on Malaysia by Ragayah. One of the problems of many of these studies is the omission of possibly important variables such as technology and foreign direct investment (FDI), which are likely to have impacts on income inequality, in the analysis of the impacts of trade on inequality. Jaumotte et al. (2013) takes on this problem by explicitly introducing technology, FDI, and several other variables in their econometric analysis.

Jaumotte et al. (2013) conducted a detailed statistical analysis of the impacts of globalization on within-country income inequality. Their data set includes 51 countries (20 developed and 31 developing) over 1981–2003. They observed that income inequality has risen in most countries from 1981 to 2003. They found that the income of the poorest groups increased, suggesting that inequality increased in the upper parts of the distribution in most countries. Their empirical analysis revealed that trade liberalization (increase in trade–GDP ratio as well as a decline in tariff rates) is associated with lower income inequality, while increased financial openness is associated with higher income inequality. The combined contribution of increasing trade and financial flows to rising inequality is slightly positive in the case of all countries and slightly negative for developing countries. It is noteworthy that exports, particularly agricultural exports, contribute to reducing inequality. Tariff reductions are found to reduce inequality. Jaumotte et al. argue that tariff reductions affected goods which are disproportionately consumed by the poor. Among different types of international financial flows, inward FDI is revealed to increase inequality. According to Jaumotte et al., this finding may reflect the phenomenon that FDI mostly takes place in relatively higher skill- and technology-intensive sectors, thereby increasing the demand for, and wages of, more skilled workers.

In contrast to the inequality-reducing impacts of trade, Jaumotte et al. found that technological progress increased inequality. This finding is consistent with an observation that technological progress increases the demand for skilled workers. We will analyze this issue more in detail in the next section on wage inequality. Based on a decomposition analysis of the change in inequality based on their estimation results, Jaumotte et al. find that the contribution of technological progress was positive

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<sup>19</sup> The measure of inequality differs among the studies, but the Gini index and the share of the poorest quintile in national income are used in many studies.

(increasing inequality) and very large, while the contribution of globalization (trade and financial flows) was negative and very small in the case of developing countries.<sup>20</sup>

In this section, we examined the impacts of globalization, particularly in the form of increasing international trade, on within-country income inequality. We first observed somewhat different changing patterns of trade–GDP ratios and within-country income inequality for some countries in recent years from the patterns observed for the period up to the early 2000s. Some countries saw a decline in trade–GDP ratios, while some countries registered a decline in within-country income inequality. These findings indicate the need for more empirical studies on this subject using more recent data.

A survey of empirical studies revealed somewhat different patterns between the country-level studies and cross-country studies. Some country-level studies showed that an increase in trade–GDP ratios worsened inequality, while some country-level studies did not detect significant impacts of trade on income distribution. Cross-country studies found that trade improved income distribution, although the impacts are rather small. These mixed results of the impacts of trade on income inequality indicate the need for more analyses.

## 4. WAGE INEQUALITY

The question about globalization and wage gap came after an observation of two different but not necessary mutually exclusive facts, that is, an increase in skilled intensity in many countries during the 1980s and 1990s and implementation of trade reforms in these countries during these periods. The two coincidentally happened at the same time. Studies on Latin American countries found that skill premium in Mexico (Cragg and Epelbeum 1996), Colombia (Attanasio et al. 2004), Argentina (Gasparini 2004), and Brazil (Gasparini 2003) all increased by at least 10% for a 5- or 10-year period within the 1980s and 1990s. The increase in Mexico is the largest among all and it suggests the strongest potential link between globalization and wage inequality; the country implemented major trade reforms in the 1980s and continued by implementing further reforms to increase FDI and facilitate cross-border outsourcing (Cragg and Epelbeum 1996).

In this section we review theoretical explanations of the possible role of globalization in affecting the wage gap in developing countries and then present recent empirical findings on this relationship in developing countries.

### 4.1 Increasing Wage Gap in Developing Countries: Theoretical Explanations

Goldberg and Pavcnik (2007) pointed out that the shift in demand for skilled workers is the main reason for a widening wage gap, or skill premium, observed in developing countries. While the demand-shift mechanism is clear, it is not so clear how the demand curve shifts. There are then questions about which factors cause demand to shift and how this occurs.

The neoclassical Heckscher–Ohlin (HO) model is not always able to explain the trend and pattern of skill premium, especially those in developing countries. The Stolper–Samuelson theorem derived from the HO model predicts that distributional

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<sup>20</sup> For developed countries, contributions of globalization and technological progress were found to be positive. The magnitude of the contribution of technological progress is more than twice as large as that of globalization (Jaumotte et al. 2013)

changes in developing countries, which usually are endowed with unskilled workers, should favor unskilled workers more than the skilled ones in the event of trade liberalization. This theorem therefore predicts a lower gap in wage between skilled and unskilled workers.

Prediction of the Stolper–Samuelson theory however contradicts the fact of increasing wage gap over time. There are at least three potential explanations for this according to Goldberg and Pavcnik (2007). First, one may extend the basic HO model, which is built upon two-sector and two-factor framework, to include the third factor (e.g., natural resource) or additional sector (non-traded goods) that requires skilled workers for the production of the sector. Further, it is assumed that natural resource complements skilled workers. If, suppose, a country has abundant in natural resources, the extended HO model predicts that trade creation in favor of an expansion in the natural resource sector increases the demand for skilled workers, which is translated to an increase in wage of skilled workers. The demand (and hence the wage) of unskilled workers meanwhile declines.

Second is the case where large tariff reduction is applied to unskilled labor-intensive sectors. In developing countries, unskilled labor-intensive sectors producing unskilled labor-intensive products typically are highly protected for various reasons (mainly for political economy reasons, i.e., major source of employment). Cuts in tariffs reduce the demand for unskilled workers and thus reduce the wage of the workers. Kumar and Mishra (2008) provide some evidence from major trade liberalization in India in the early 1990s, in which tariff reductions were disproportionately larger in labor-intensive sectors. An increase in the wage gap was observed in these sectors.

Third, there is a shift in the distribution of comparative advantage across countries, with the emergence of the PRC or other developing countries that have comparative advantage in unskilled workers intensive sectors. This pushes more advanced, or middle-income, countries as those in Latin America in the 1980s to move their pattern of comparative advantage towards goods with higher skill intensity.

Other alternative explanations not in the context of HO model have been put forward in the literature. The first is the ‘outsourcing’ or ‘product sharing’ theory of Feenstra and Hanson (1996, 1997). The theoretical model developed by Feenstra and Hanson shows that FDI increases demand for skilled labor and thus increases skill premium. This model emphasizes the growing importance of trade in intermediate inputs, partly as a result of FDI. In the model, relative demand for skilled labor is increased because production of relatively skill-intensive intermediate inputs is shifted to these countries. While the shift can be characterized as less skill-intensive from the perspective of a developed country, it is skill-intensive from the perspective of a developing country.

It is useful to make some comments on the difference between traditional trade theory and the one suggested by Feenstra and Hanson. The main difference comes from different expectations of how globalization changes production of skill-intensive intermediate inputs. The former expects a decline in production because many intermediate inputs are replaced by imported ones. Feenstra and Hanson’s theory, meanwhile, predicts that domestic production is increased because now many of the inputs are produced locally by ‘outsourced’ firms. The magnitude and direction of globalization impact on wage premium thus depends on the changes in production of skill-intensive intermediate inputs.

The second explanation is the one often termed skill-biased technological change (SBTC). SBTC argues that the technology used in many developing countries has become more advanced over time, inducing an increase in the demand for skilled workers. The process that brings in advanced technology to these countries however is

not random. It depends on openness, that is, technology transfer from overseas or more developed countries is facilitated by a more open trade and/or a more liberal investment regime. Technology therefore is endogenous to openness, and this is how globalization is responsible for the skilled-bias technological change (Goldberg and Pavcnik 2007).

Two mechanisms reflecting endogeneity are provided by Wood (1999) and Acemoglu (2003). The first is 'defensive innovation' as Wood termed the response. He hypothesized that intensified competition from imports may induce firms to engage in R&D activities that they have little incentive to undertake before trade liberalization (Goldberg and Pavcnik 2007). The second mechanism, suggested by Acemoglu (2003), comes from imports of machinery or other capital goods that are complementary to skilled workers. In this model, trade liberalization reduces the price of the machinery and capital goods and therefore increases the imports of these goods. This results in an increase in the hiring of skilled workers for the operation of the more advanced technology installed by imported inputs.

## **4.2 Increasing Wage Gap: Findings of Empirical Studies on Developing Countries**

A recent study by Amiti and Cameron (2012) provides some support for the Stolper–Samuelson theorem in explaining skill premium in developing countries, by examining the effects of tariff reduction on wage skill premium in Indonesian manufacturing. Amiti and Cameron examined the effects of output and input tariffs separately, and they found that a cut in input tariffs reduced skill premium among firms that imported intermediate inputs. Relative demand for skilled labor was lowered because domestic production of relatively skill-intensive intermediate inputs was replaced by imports.

Aldaba (2013) also found a declining wage gap in the Philippines manufacturing sector as an impact of trade liberalization introduced by the Association of Southeast Asian Nations (ASEAN) Free Trade Agreement (AFTA). The finding is robust when the impact was tested using effective and nominal rate of protection. Aldaba suggested that, given more intense foreign competition after trade liberalization, import-substituting firms may have decided to concentrate on the low value added stage of the production process that requires relatively less skilled workers.

The results of Amiti and Cameron, which are consistent with the prediction of trade theory, however are in contrast to the findings that emerged from other studies. There is evidence from these studies that globalization increases skill premium not only in developed countries but also in developing countries.

A number of studies provide some support for the SBTC hypothesis. Galiani and Sanguinetti (2003), for example, observed a positive relationship between import penetration ratio, which increased from 5.7% in early 1990s to 19% in 1999, and hourly earnings of college graduates in Argentina. An increase in the demand of skilled workers is suggested to have come from an increase in imported goods.

In terms of support for outsourcing theory, Kohpaiboon and Jongwanich (2013), using plant-level data from Thai manufacturing, examined the effects of both the engagement with global production networks and the reductions in tariffs on wage skill premium within firms. They particularly focused on the effects of engagement with global production networks, arguing the growing concern in developing countries' policy makers that participating in global production sharing could trap their enterprises in using low-skilled or low-quality workers and retarded technology. The study found that the engagement with global production networks increases wage skill

premium in skill-intensive firms, contrary to the concern of policy makers. Their finding suggests that the firms in production networks undertake restructuring using more advanced technology.

Thangavelu (2013) came up with findings along the same lines. Using enterprise-level data of Vietnamese manufacturing, he found that firms adopting new technologies and restructuring their organization, as a response to a liberalized trade and investment regime, were likely to experience an increase in wage gap between skilled and unskilled workers.

One may argue that the widening wage gap is partly due to an increase in exports, as a result of a more open trade regime globally. Global and regional production networks have been constructed actively by multinational corporations in East Asia. Under the production networks the magnitude of trade, both exports and imports, expanded significantly, contributing to the increased wage gap. Kohpaiboon and Jongwanich, Thangavelu, and Aldaba, support this argument. All of them found that widening wage gap was evident in more skilled sectors, which also are export oriented sectors at the same time. This is consistent with a study conducted by Bernard and Jensen (1997) that observed an increase in employment of exporting plants, which in turn is found to have contributed to an increase in demand for skilled labor.

Several studies confirm the hypothesis of endogenous technology in the SBTC theory. Attanasio et al. (2004) show for Colombia that the increase in skill intensity over the time after trade liberalization was observed in all industries and the liberalization was found to affect the so-called 'industry premium' in wage determination (the premium is associated with anything but workers or industry characteristics). Their finding is consistent with the prediction of SBTC. In addition, Attanasio et al. (2004) documented that the increase in demand for skilled labor in Columbia was the largest in the sectors that experienced the largest cuts in tariff.

The point about endogenous technology through R&D mechanism was made by Hahn and Choi (2013) in the case of Korean manufacturing. They examined the effects of output and input tariff reductions on within-plant wage skill premium in Korean manufacturing plants, and they found that output tariff reduction interacts differently with plants' R&D and investment behaviors in affecting skill premium. Specifically, output tariff reduction increases wage premium in R&D-performing plants while it reduces wage premium in plants making facility investments. One story behind the results is that, although both R&D and facility investments may respond to changes in profit opportunities due to output tariff reductions, R&D raises relative demand for skilled workers while facility investment, an activity of increasing production capacity, raises the demand for unskilled workers.

Meanwhile, for the case of the PRC, Anwar and Sun (2012) provide support for the competition channel that induces investment in technology through the 'defensive innovation' mechanism termed by Wood (1999). Anwar and Sun show that the extent of wage gap increased by about 50% over just 6 years, from 2000 to 2006, and they explained much of it as an impact of competition forces from import that push firms to hire more skilled workers. This seems to have been facilitated by an increase in the proportion of private firms; in their study, private ownership variable is found to have been positively related with wage gap.

The competition channel of the 'defensive innovation' is also found in the case of Indonesian manufacturing. Using data of medium and large establishments, Takii and Narjoko (2013) examined how greater exposure to international trade and FDI affects the extent of skill premium in wage and employment intensity. They found tariff cuts have led local plants with low share of imported inputs, as well as non-importing plants,

to hire more skilled workers. This was likely a result of efficiency enhancing measures by plants in response to more competitive pressure from foreign competition.

To sum up, evidence seems to point to rising inequality within country—as a result of rising wage gap—comes from the creation, or existence, of more sophisticated goods produced domestically. Technology transfer is behind this phenomenon, working in various ways proposed by all non-traditional trade theories (i.e., subcontracting/product sharing theory and SBTC). Here, unlike traditional trade theory, and because of production networks across countries, trade liberalization allows importation of advanced machineries that eventually raise the demand of skilled workers. This is the key difference; if traditional theory is adopted, importation only replaces goods initially produced domestically; there is only a weak element of technology transfer in the importation. Evidence also seems to indicate that in countries where production networks are not strong, such as in Indonesia and the Philippines, trade liberalization tends to behave more in line with predictions of traditional theory; in these countries for example, trade liberalization seems to purely substitute products, or intermediate input, initially produced domestically.

## 5. REGIONAL INEQUALITY

Widening regional income inequality has been reported in many countries. Some of the most frequently reported cases include the PRC and India. The problem of regional inequality is a big concern for many people, mainly because of its social and political impacts. Growing regional inequality would result in imbalance in the level of economic development between and among the regions, which in turn would increase social and political tensions, possibly resulting in deterring overall economic growth. Globalization is often accused of worsening regional inequality, mainly because the timing of rapid globalization coincides with growing regional inequality in several countries, including the PRC and India. However, coincidence does not mean causality. In other words, we cannot be sure if globalization has deteriorated regional inequality, unless we undertake rigorous empirical analysis.

Let us briefly review what economic theory tells us about globalization and regional inequality. According to spatial economics, the location of economic activities is mainly determined by the benefits and costs of agglomeration and transportation costs. Think of a firm deciding the location of its operation. It would choose to locate in an urban area where many firms form agglomeration, if it thinks the benefits of agglomeration in the forms of ease of access (including transportation cost) to sales and procurement networks as well as access to various kinds of information such as information on technology and market outweigh the cost of agglomeration such as traffic congestion and high cost of land, then a firm would locate in an urban area. If the reverse is the case, then a firm would locate in a rural area.

Recognizing the forces toward and against agglomeration, then the question is if globalization increases forces toward or against agglomeration. This depends on various factors including the kinds of activities promoted by globalization and the location of ports and airports (infrastructure), which become gateways to connect domestic economic activities to global economic activities. If globalization leads to an increase in agricultural production, which does not generally gain benefits from agglomeration, then economic activities will spread to rural areas, thus contributing to reduction in regional inequality. On the other hand, if globalization leads to an increase in manufacturing production, which gains benefits from agglomeration, then economic activities are likely to be clustered in urban areas, contributing to regional inequality.

These discussions indicate that one cannot know if globalization increases or reduces regional inequality a priori. The outcome depends on various factors, some of which were given above. In this section we discuss the studies on the PRC, India, Brazil, Indonesia, and Mexico.

Zhang and Zhang (2003) observed an increase in regional inequality in the PRC from 1986 to 1998, as the regional (provincial) Gini coefficient increased from 19 to 26, reflecting booming coastal regions in contrast to sluggish inland regions. Using the provincial data covering the 1986–1998 period, Zhang and Zhang estimate a model that quantitatively decomposes the effects of the following variables listed below on regional inequality. Their findings show the contribution of these variables as follows: domestic capital (75.1%), foreign capital (8.1%), education (–8.0%), foreign trade (11.1%), inland/coast (3.8%), and other factors (9.9%). Based on these findings, Zhang and Zhang conclude that globalization through foreign trade and FDI played an important role in worsening regional inequality in the PRC. They argue that this finding is in contrast to theoretical predictions of the standard trade model that implicitly assumes integrated factor markets, and their finding can be explained by the fact that factor markets have been rather segmented in the PRC. Because of this segmentation, most gains from globalization have gone to the coastal parts of the country, leading to widening regional disparity.

Pal and Ghosh (2007) examined regional (inter-state) inequality in India from the 1980s through the early 2000s, in addition to vertical inequality discussed in section 3. They found that regional inequality worsened during the 1990s. Specifically, the ratio of the per capita Net State Domestic Product (NSDP) of the richest state, Punjab, to that of the poorest state, Bihar, increased from around 3 in the late 1980s to 4.7 in the early 2000s. The inter-state Gini coefficient increased from around 16 in the late 1980s to around 23 in the late 1990s. Although Pal and Ghosh did not discuss explicitly the causes of increasing regional inequality, they seem to argue that the same factors that contributed to increasing vertical inequality also contributed to increasing regional inequality. In other words, trade liberalization was argued to be one of the factors that led to increasing regional inequality.

Daumal (2013) also found a substantial increase in regional inequality in India from the 1980s to the early 2000s. Specifically, the regional Gini coefficient increased from 16.0 in 1980 to 17.7 in 1990, and to 25.6 in 2003. The trade (exports+imports)/GDP ratio increased from 15% in 1980 to 40% in 2003. Applying the error correction model to the time-series data, she found that trade openness contributed positively to the increase in regional inequality. This finding is consistent with the assertion made by Pal and Ghosh. Daumal argued that during the 1980–2003 period, India's exports shifted from agricultural products to manufacturing products, resulting in higher growth of the rich region engaged in manufacturing relative to the poor agricultural region. She also pointed out that opening up the country in the 1990s led to high economic growth in the coastal region, as an agglomeration effect was set in motion.

Daumal (2013) also analyzed the case of Brazil, where the trade–GDP ratio increased from approximately 17% in the late 1980s to about 30% in the early 2000s. Unlike India, Brazil did not experience an increase in regional inequality. Indeed, regional inequality declined as the regional Gini coefficient declined from 27.3 in 1985 to 23.8 in 2003. Her time-series analysis showed that trade openness had a statistically significant negative impact on regional inequality. She attributes her finding to the fact that a large part of Brazilian exports consisted of agricultural products, which are grown in relatively poor regions. Furthermore, she observes that trade liberalization in Brazil led to relocation of some industrial activities to peripheral regions.

Resosudarmo and Vidyattama (2006) analyzed the regional income disparity in Indonesia. Using data covering the 1993–2002 period, Resosudarmo and Vidyattama observed that regional income disparity is quite severe compared to other developing countries including the PRC and India. However, they found that there is a conditional convergence in regional income per capita growth from their statistical analysis. They also found that trade openness contributed positively to regional income per capita growth, resulting in reducing regional inequality. Resosudarmo and Vidyattama did not give explanations for their finding.

Aroca et al. (2005) examined the changes in regional inequality over the period marked by trade liberalization (the accession to the General Agreement on Tariffs and Trade [GATT] in 1986 and the establishment of the North American Free Trade Agreement [NAFTA] in 1994) in Mexico. The authors observed a tremendous increase in disparity, which was realized in the form of creating several income clusters, thereby creating a “south” (low income region) and a “north” (high income region) in Mexico. What is notable is that these income clusters do not map to geographic regions, except the north region, which is directly on the US border. They found that the substantial divergence occurring in the 1985–2003 period is not related to the consolidation of a faster growing northern block but that only the south shows covarying growth rates. They argue that two likely explanations for the divergence occurring after trade liberalization are the sustained underperformance of the southern states, beginning before NAFTA, which affected local agricultural industries, and to a lesser extent the superior performance of an emerging convergence club in the north–center of the country.

An examination of the studies on the impact of international trade on regional inequality revealed that the impacts are mixed in that in some cases (Brazil and Indonesia) expansion in trade contributed to a reduction in regional inequality, while in some cases (the PRC, Indonesia, and Mexico) trade expansion increased regional income inequality. The different impacts are largely attributable to the composition of trade and the location of industry. If exports of agricultural products, which are grown in the poor region, increase, then regional inequality will be reduced. On the other hand, if exports of manufactured products, which are produced in the relatively rich urban region, increase, then regional inequality will be increased. It was also found that limited labor mobility has a negative impact on regional inequality.

## 6. CONCLUDING REMARKS

We analyzed the impacts of globalization, particularly in the form of international trade, on inequalities from various perspectives. In terms of theory, increased trade is shown to have both positive and negative impacts on inequalities. In terms of global inequalities, increased trade can widen or reduce the gap between developing and developed countries, while within countries increased trade can improve or worsen inequalities in income, wages, and regional income disparities.

Our review of the empirical studies found that an increase in trade openness by developing countries appears to have contributed to narrowing the development gap vis-à-vis developed countries, while its impacts on income gaps between developing countries are not clear. The impacts of increased trade or trade liberalization on within-country inequalities are found to be mixed. In some cases, trade liberalization improved wage-inequality, but in some cases, the opposite pattern was observed. Similar mixed patterns are found for regional inequalities. These mixed findings are consistent with the fact that theoretical predictions are also mixed. One of the problems



in empirically discerning the impacts of trade openness on inequalities is the difficulty in isolating the impacts of trade on inequality when many factors other than trade, including labor market conditions, inflow of capital, policy reforms, which influence inequalities are at work. Furthermore, as Goldberg and Pavcnik (2007) argue, the particular mechanisms through which globalization affected inequality are country, time, and case specific, implying the difficulty in obtaining a general pattern. It is warranted then to conduct more empirical studies on the subject, particularly by using micro-data on trade, production, employment at firm and household levels, which have become available for an increasing number of countries in recent years.

Having discussed the ambiguity of the impacts of trade on inequality, we have realized that trade is one of many factors that affect inequality. This is particularly the case for the countries where trade accounts for a small part of their economic activities. Two important factors that affect inequality include discriminatory educational systems and labor market imperfection. Discriminatory educational systems that discriminate against the poor and labor market regulations that limit the mobility of labor would result in widening wage/income inequality.

Recognizing the importance of ameliorating inequalities in order to achieve a stable social and political environment, which is important for achieving sustainable economic growth, the government needs to implement appropriate policies to deal with the problems noted above. Specifically, the government should promote human resource development that would improve the quality of labor by providing education and training. Given the ongoing trend of increasing demand for skilled labor in developing countries, an increase in the supply of skilled labor would reduce income inequality at least compared with the case where the quantity of skilled labor remains constant. One needs to stress the importance of well-functioning and flexible labor market, where workers with improved skills can find and obtain appropriate jobs.<sup>21</sup>

It is important to note that the government should implement income redistribution policy in order to achieve balanced growth. Specifically, the government should provide social safety nets for the workers that are negatively impacted by trade liberalization/increased imports. Provision of social safety nets, which includes provision of income compensation, and education and training, would not only reduce the negative impacts on the workers but also limit worsening inequalities. Safety nets should be provided temporarily not permanently, because its task is to reduce the adjustment cost. Finally, progressive income tax systems and inheritance tax systems should be adopted to redistribute income from the rich to the poor. Having discussed the need to introduce redistributive tax systems and realizing that excessively high tax rates would deter economic growth, the government has to apply appropriate tax rates that lead to a good balance between equity and economic growth.

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<sup>21</sup> On these points, see Bolaky and Freund (2008), and Chang et al. (2009).

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