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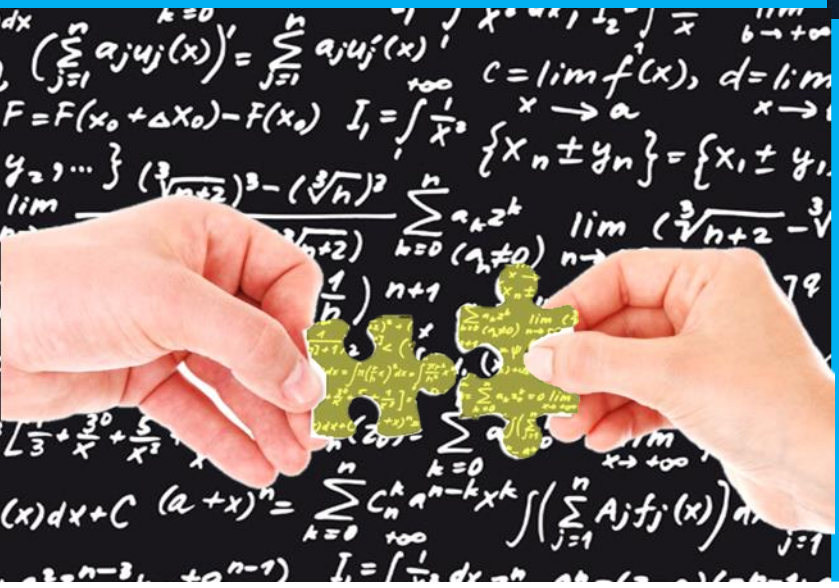
Evidence from Thailand



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WORKING PAPER

Trade liberalisation and poverty: Evidence from Thailand

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Abstract

This paper replicates the study of Topalova (2010), performs a robustness check, and extends the findings by applying the estimation technique to the economy of Thailand. Topalova (2010) found that trade liberalization in India has heterogenous effects on poverty and household consumption. More specifically, districts in which production sectors are more exposed to trade openness, experienced less poverty reduction and slower consumption growth. The effects of trade reform on poverty have been extended to a squared poverty gap, and the results are robust to other poverty measures. We then apply the methods to Thailand by examining the relative effects of accession to the WTO in 1995, and find that poverty reduced more in provinces with a greater exposure to trade reforms. Labour mobility is a potential channel underpinning this effect. Furthermore, these impacts are more pronounced on the poorer samples and urban areas.

Keywords: Trade, Liberalisation, Poverty

JEL Codes: F10, F14

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1. Introduction

Thailand has successfully transformed from an agrarian to a manufacturing-based economy. The economic transformation has been encouraged by an export-led growth policy.[1] Exposure to the global market provided an opportunity for this small country to grow. A spectacular growth driven by trade, arguably, resulted in impressive poverty reduction in the past few decades.

During the 1950s, Thailand was one of the poorest countries in the world (Manarungsan, 1989). Gross domestic product (GDP) per capita (at constant 1950 prices) was 1,138 Baht. Agriculture was an essential component of the economy. Exports were not an engine of growth. However, since the first National Economic and Social Development Plan was adopted in 1961, the economy of Thailand was redirected to a more efficient and clear path aimed to develop the economy and the society. One of the critical strategies was an interaction with other economies through trade and investment. Several agencies were set up to facilitate and promote economic growth, especially the Board of Investment (BOI), established in 1966. During the 1960s and 1970s, Thailand adopted an import-substitution policy, a popular strategy among developing countries to industrialize and reform their economies. Tariffs and other quantitative restrictions were used heavily to protect the manufacturing sector. Export taxes were also applied to many agricultural export commodities (Warr, 1993). As other countries at that time, Thailand aimed to protect infant industries for a specified period and to support domestically made inputs.[2] However, with a miracle growth of the Newly Industrialised Countries (NICs) during the 1970s and 1980s including Taiwan, Province of China; Republic of Korea; Hong Kong, China; and Singapore, numerous low-income countries reconsidered their economic policies and turned

[1] It is also referred to 'outward-oriented policies' that prioritize export sector more than domestic sector. It then creates a more open economy, interacted with global market.

[2] Infant industry argument reflects the situation where new manufacturing industries in the developing countries are not able to compete with the large-scale, efficient manufacturing in the advanced countries. The government should protect these infant industries for a short period of time until they are efficient enough to intense competition (Krugman, Obstfeld, & Melitz, 2018)

their interests to participate in the world markets. Even though NICs implemented several policies simultaneously, trade openness was clearly the crucial one.

As NICs continued their export-led development, in addition to tariffs and export taxes, Thailand adopted several restrictive measures, for example, quotas, export controls, and import bans. Rice and sugar were highly protected from foreign competition. However, there was a gradual shift to trade regime. Between 1969 and 1974, most of the export sectors were agricultural commodities, for example, rice milling, frozen seafood, and canned fruit. Since 1980, export industries became more diversified. The new export industries were canned fish, garments, rubber products, wood products, and footwear. The main characteristics of these new exports were their labour-intensive nature, which reflected the fact that low-skilled and low-cost labour was ample in Thailand. Manufacturing sector exports surged. Exports of goods and services increased from 16.1 per cent in 1960 to 24.1 per cent of GDP in 1980, and to 34.1 per cent in 1990. In the next three decades, exports as a percentage of GDP doubled. A significant increase in the share of exports in GDP is the evidence that the economy of Thailand became more engaged with trade over time (Warr, 1993; World Bank, 2018a, 2018b).

With rapid economic growth from 1975 to 1981, poverty incidence in Thailand fell from 30 per cent to 23 per cent (Hutaserani & Jitsuchon, 1988). The Northeast was the poorest region of Thailand, with a poverty rate of 44.9 per cent in 1975, followed by the North and the South with poverty rates of 33.2 and 30.7 per cent, respectively. Due to the reduced growth caused by the world recession, Thailand experienced an increase in the poverty rate between 1981 and 1986. However, the poverty rate declined to 21.2 per cent in 1988 (Krongkaew, Tinakorn, & Suphachalasai, 1991). The official statistics of poverty published by the National Economic and Social Development Board (NESDB) from the socio-economic household survey are available after 1988 (Table A.I in the appendix). Due to the differences in indicator calculation methods, it is difficult to compare the data from NESDB with the ones cited before. According to NESDB, from 1990 to 2016, Thailand's poverty rate declined by almost 50 per cent. The poverty rate in 2016,

the latest year for which data was available, was 8.61 per cent.[3] The Northeast region still the poorest region of Thailand since 1990; however, its progress in poverty reduction over time has been more impressive than in the South – the second poorest region.

Along the path of development since the 1950s, miracle growth took place for a short time between 1988 and 1990 where the economy of Thailand achieved a double-digit growth rate.[4] This growth was primarily driven by the manufacturing sector of the economy, with its added growing at 12 per cent annually during this period. In 1988, the manufacturing sector grew by around 18 per cent, while agricultural and services sectors grew only by 10.5 and 12.1 per cent, respectively. This growth continued until the 1997 Asian Financial Crisis, which saw manufacturing sector contracting by 8.4 per cent in 1998. During the high growth period, exports and imports also grew at more than 20 per cent per year. Moreover, the poverty rate declined from 65.17 per cent in 1988 to 57.97 per cent in 1990, and to 50.04 per cent in 1992. Thus, growth in trade and the manufacturing sector were likely to significantly contribute to both, economic growth and poverty reduction during the early 1990s (Phongpaichit, 1996; Warr, 2007).

The present study focuses primarily on the impact of trade policy on poverty in Thailand. There are several mechanisms connecting trade, growth, and poverty. Numerous studies found the positive relationship between trade and growth using cross-country analysis (Edwards, 1993; Harrison, 1996; Lee, Ricci, & Rigobon, 2004). However, it is difficult to derive a causal relationship due to the problem of endogeneity of the relation, particularly as a result of reverse causality. As trade is an essential component of the Gross National Income, trade surplus is thus likely to spur economic growth, on average, across industries. However, it is possible

[3] It should be noted that poverty rate displayed in table A.1 are calculated using the national poverty lines which increase every year, mostly depend on the economic performance. Using the international poverty line ($1.90 a day) calculated by the World Bank, Thailand's poverty rate (extreme poverty) becomes zero since 2013 (World Bank, 2018).

[4] GDP growth rates in Thailand were 13.3, 12.2, and 11.2 per cent in 1988, 1989, and 1990, respectively (World Bank, 2018)

that economic growth can make people better off by having higher income, and higher purchasing power due to lower-cost imports. At the same time, it is possible that the reverse is the causal link: countries with high economic growth engage more in international trade.

Some studies question whether estimation methods and the definition of trade directly address the question of the direction of causality in the estimated result (Rodriquez & Rodrik, 2001). As such, other studies use specific econometric techniques, for example, instrument variable regression, to tackle the problem of endogeneity to find the positive relationship between trade openness and economic growth (Frankel & Romer, 1999; Ferrarini, 2010). As trade can positively affect income growth, poverty is expected to fall based on this channel. Nevertheless, there are also other ways to assess the relationship between trade and poverty, mainly through the employment effect. An export of labour-intensive goods could spur job market in the developing countries where labour is relatively abundant. An increase in income among workers is likely to boost consumption and then subsequently reduce poverty.

However, trade reform does not only yield a positive result. There are also several studies working through the effect of trade reform or liberalization on employment that directly link to poverty. As trade creates both winners and losers, poverty reduction can be dampened if workers in import-competing industries cannot adjust or move freely to the exporting sector. A study by Goldberg and Pavcnik (2007) found that Colombian workers experienced an increase in unemployment after Colombia joined the General Agreement on Tariffs and Trade (GATT) in 1981. Surprisingly, the authors found that trade reforms may have contributed to an increase in urban poverty. They also found no direct link between the trade reforms and the overall poverty reductions. Topalova (2007), studying the economy of India during trade reforms, found the similar result: rural areas that are unevenly affected by tariff reductions experienced slower poverty reduction. The results are not consistent with the standard trade theory because labour is immobile across

industries due to inflexible labour law. An inability to reallocate across Indian states and industries after trade openness is then the primary cause of the result.

The purpose of the current study is to estimate the relative change in poverty due to trade reforms after Thailand became a member of the World Trade Organization (WTO) in 1995. Labour Force Surveys and Tariffs data allow us to estimate the heterogeneous effects of trade reforms. Variation in the production sector, derived from employment, provides an estimate of different levels of exposure to trade liberalization in each province. This paper tries to determine whether changes in provincial-level poverty and income before and after joining the WTO are related to trade openness at the provincial level. The instrument variable regression used in the present study does not assess the overall impact of trade liberalization on poverty, but measures the relative effect of trade openness on provinces that were more or less exposed to trade. We find that the average poverty reduction is higher in territories that are more exposed to trade openness. The average monthly income grew relatively faster in provinces where employment was concentrated in traded sectors. Additionally, the impact on poverty and mean income were more pronounced on the poorer sample. It is suggestive that the more vulnerable groups of people obtained more benefits in terms of an improvement in economic well-being. The result can implicitly refer to better distribution of income after trade openness. Surprisingly, the results also suggest that tariff cuts have a more significant impact on the poor living in urban area. This result is consistent with the fact that poverty declined more rapidly among the central region.

Our finding is consistent with standard trade theory assuming that factors of production are freely mobile across industries. A movement of labour from import-competing sectors, which are negatively affected by foreign competition to exporting sectors, which can take advantage of relatively low cost and abundance of labour. Each year, a certain number of workers migrate within the country. Work-related migration constitutes a significant reason for internal migration. There are no laws or regulations restricting migration and employment expansion in the specific production. Also, our finding is consistent with a prediction of distributional

gain from standard trade theory stating that owners of a factor that are used intensively will gain from trade. As Thailand is relatively laboured abundant country and its exports are labour-intensive goods, labour is expected to win from trade. Moreover, as the urban poverty declines more rapidly than rural poverty, it reflects the fact that traded industries are essentially concentrated among the central region, around Bangkok. Even though Thailand's BOI has been providing generous incentives for both indigenous and foreign firm to install their factories in the countryside to promote regional development, those firms are still located around Bangkok, the capital, and vicinities. However, our findings do not fully address several issues, for example, non-tariff barriers, trade in services, and also an increase in the consumer's welfare after trade.

In Section II, we provide an overview of a story of Thailand as a member of the WTO. In Section III, we describe our data, and in Section IV, we discuss the estimation strategy. Section V contains the empirical results, and Section IV presents a discussion and concludes.

2. Thailand and the World Trade Organization

After the World War I, several industrialized countries erected high trade barriers. In 1930, the United States passed an infamous tariff law, namely the Smooth-Hawley Act. It was argued that this Act exacerbated the Great Depression. After the World War II, there was an attempt among these advanced economies to turn their policies to trade openness, including through reducing tariffs. Significant progress in trade liberalization has been achieved through the process of "multilateral trade negotiations."

The basic idea of these multilateral negotiations was that the participating economies would reduce their tariffs at the same time. There was also an attempt to establish an organization aimed at helping facilitate trade named the International Trade Organization (ITO) in 1948. However, it had never materialized.

Negotiations then took place through GATT, established in 1947.[5] The progress of trade liberalization was conducted through 'trade rounds.' Between 1947 and 1994, there were altogether eight trade rounds conducted under GATT. The last successful trade round was the Uruguay Round that started from 1986 and was completed in 1994, involving 123 economies in negotiations. It was seen as a bargain between the high and low- to medium-income countries. Developed and developing countries were required to open their markets in different areas. The main result of the Uruguay Round was similar, in essence, to other trade rounds, which were mostly about tariff reductions. However, countries were also required to bind their customs duty rates on the imports of goods. When a tariff is bound, the country imposing it agrees not to increase tariff in the future beyond the bound level. Currently, almost all tariff rates among the developed economies are bound, while about three-quarters of the developing countries' are (Krugman, Obstfeld, & Melitz, 2018).

The requirements from the Uruguay Round can be broadly separated into two groups, dependent on the level of development across participants. The industrialized countries agreed to significantly reduce the tariff on manufactured goods, eliminate the Multi-Fiber Arrangement (MFA),[6] and reduce agricultural subsidies. The developing countries, in turn, promised to reduce their tariffs, agreed to the new rules on investment, trade in services, and trade-related intellectual property rights (TRIPS), and support the establishment of the new organization called the WTO on 1 January 1995.[7] Then, the WTO was developed to administer and address the GATT, the Uruguay Round Agreement, and also future trade rounds. It was established with an aim to serve as a central institution

[5] GATT is an agreement (not an organization). Country participating in this agreement were called a 'contracting party', instead of member (Krugman, Obstfeld, & Melitz, 2018)

[6] Industrialized countries are required to abolish the MFA within 10 years. It is referred to a removal of all quantitative restrictions on trade in textile and clothing (Majd, 1995).

[7] From a legal view, the GATT is an agreement while WTO is an international organization. The original GATT documents has been merged to the WTO rules. While GATTs applied to trade in goods only, WTO rules cover trade in services and other broad issues (Krugman, Obstfeld, & Melitz, 2018).

for global trade negotiations and a forum for dispute settlement. Regarding tariff reductions, the requirement to reduce tariffs was different between developed and developing countries. For non-agricultural goods, the developed countries were required to reduce their import tariffs by 40 per cent, while it was merely 20 per cent for the developing countries. Average tariffs fell from 6.3 per cent to 3.8 per cent in developed economies, and from 15.3 per cent to 12.3 per cent in developing economies (Buterbaugh & Fulton, 2007). For agricultural goods, all non-tariff barriers were to be eliminated.[8] Tariffs were to be reduced by 36 per cent among the developed countries while the developing countries had to reduce tariffs by 24 per cent within ten years. Additionally, all countries were required to bind all their agricultural tariffs, but they were allowed to bind them at high rates. In cases when unbound duties and other non-tariff measures were prevalent at the beginning of the Round, participating countries were also required to carry out a tariffication process (Ingco, 1996; Daly & Kuwahara, 1998; Perkins, Radelet, Lindauer, & Block, 2013).[9]

Thailand became a member of GATT in 1982. It is a founding member of the WTO. As such, Thailand is required to apply the most-favoured-nation treatment to all WTO members.[10] From the Uruguay Round commitments, all agricultural tariffs were bound, and the level of bindings among industrial commodities rose from 2 to 68 per cent. At that time, Thailand's applied import tariffs ranged from zero to 100 per cent among knitted goods, footwear, rubber products, and motor vehicles. Canned fisheries products, wine and beverages, and malt liquors were subject to high import tax as well. A simple average of tariffs was 13 per cent across all

[8] Agricultural products were considered under the GATT trade round for the first time in the Uruguay Round (Buterbaugh & Fulton, 2007).

[9] Tariffication is a process of converting non-tariff barriers into tariff equivalents (Moschini, 1991)

[10] Most-favoured-nation (MFN) treatment is the main principle of WTO's trading system. It is referred to treatment to other member equally - there is no discrimination between member's trading partners. However, this principle can be exempted in case where countries sign free trade agreements. Another case for the exception is a provision of a special market access from developed countries to developing countries, such as the Generalized System of Preferences (GSP) (World Trade Organization, n.d.).

products. The tariffs system has been restructured to reduce the maximum tariff from 100 per cent to 30 per cent for most items. However, one important exception was the motor vehicle sector, which maintained a 38 per cent tariffs rate. For the agricultural sector, numerous quantitative restrictions were replaced by tariff measures. Thailand also abolished 14 local content requirements (LCRs) in accordance with the WTO requirements. However, there some LCRs, namely in the dairy and motor vehicle parts sectors stayed on, and were removed only in 1999. Domestic laws and regulations were revised to promote trade in goods and services, TRIPS, investment, and other trade-related issues. In 2015, 75.2 per cent of traded goods were had bound tariff rates. Simple average final bound rate was 28 per cent, with 39.4 per cent for agricultural products and 25.6 for non-agricultural products. Simple average MFN applied tariff in 2015, was 11 per cent. However, the average MFN applied tariff rate among agricultural products was 31 per cent while it was only 7.7 per cent for other goods. Duty-free bound rate was only 2.2 per cent; nonetheless, zero tariffs were applied to 35.3 per cent of goods. Moreover, 66.3 per cent of goods were bound with a rate greater than 15 per cent, but only 24.5 per cent of goods were subject to import tax higher than 15 per cent. In conclusion, Thailand, like other developing countries, is protecting its agricultural products more than manufactured goods (World Trade Organization, 2017; World Trade Organization, n.d.).

3. Data

Table 1 provides descriptive statistics of the variables used in our estimation. The data is for two years,1995 and 2005, disaggregated by 76 provinces of Thailand, and includes changes in the poverty rates, mean income levels and tariff rates between. Tariffs data is from World Bank's World Integrated Trade Solution (WITS) database. Employment data are from the Labour Force Survey (LFS) provided by the National Statistical Office of Thailand. A two-stage sampling methodology was adopted for the survey. Seventy-six provinces were constituted strata for each LFS

and used in this study. Employment data in LFS are classified by Thailand Standard Industrial Classification (TSIC).[11]

The 1995 LFS survey used a discontinued coding system, hence it was necessary to re-code several variables, for example, provinces and monthly income. We also needed to aggregate production sector in LFS into seven groups, specifically agriculture, manufacturing, mining, services, transport, construction, and trade. Tariffs data from WITS were grouped broadly into the agricultural sector (Harmonized Commodity Description and Coding System (HS) codes 01-15) and the manufacturing sector (HS codes 16-97).

We derived the provincial poverty rates by using the national poverty line calculated by NESDB. However, the poverty line originally calculated was based on monthly expenditure using household socio-economic survey. Instead, we used the monthly income as a proxy for spending.[12] Due to the limitations of the data, we used the poverty line of the whole country instead of provincial poverty lines to extract provincial poverty rates. Nevertheless, the poverty rates obtained by this method were close to the poverty rate data calculated by NESDB using household survey.

During the period, the share of agricultural and manufacturing industries decreased by 5 to 6 percentage points, but the share of services sector doubled from 23.6 per cent to 49.3 per cent. The poverty rate declined by 18.9 percentage points over a period of 10 years, and the tariff rates were reduced by approximately 10 percentage points for both scaled and non-scaled tariff.

[11] Unfortunately, there is no direct English translation of TSIC. However, a concordance table between TSIC (2009) and ISIC Rev. 3 are available at:
http://statstd.nso.go.th/classification/download.aspx

[12] In Topalova's paper, Deaton's poverty line was calculated against the official poverty line. Also, our distinction and matching may be different from the original paper since Topalova (2010) does not provide a breakdown of tariff rates and employment data.

Table 1: Descriptive statistics

	1995			2005		
	Mean	**SD**	**Obs.**	**Mean**	**SD**	**Obs.**
Poverty Rate	0.4703	0.1217	76	0.2812	0.1235	76
Log Mean Income	8.5054	0.2261	76	9.0074	0.1787	76
Scaled Tariff	0.1943	0.0513	76	0.1117	0.0473	76
Nonscaled Tariff	0.3821	0.0474	76	0.2779	0.0823	76
Share Agriculture	0.3736	0.145	76	0.3162	0.136	76
Share Manufacture	0.1289	0.0937	76	0.0744	0.0783	76
Share Mining	0.0012	0.0036	76	0.0618	0.0423	76
Share Service	0.2362	0.0545	76	0.4926	0.0833	76
Share Transport	0.0318	0.0157	76	0.0022	0.0045	76
Share Construction	0.0517	0.0184	76	0.0533	0.0141	76
Poverty Rate Change (1995-2005)	-0.1891	0.1652	76			
Log Mean Income Change (1995-2005)	0.502	0.1743	76			
Scaled Tariff Change (1995-2005)	-0.0826	0.03	76			
Nonscaled Tariff Change (1995-2005)	-0.1042	0.0414	76			

Source: poverty rate, mean income, employment shares were calculated using Thailand's Labour Force Survey. Tariff were calculated using World Bank's WITS database.

4. Estimation strategy

4.1. Addressing endogeneity

The problems of endogeneity, particularly due to reverse causality, can confound the estimated relationship between trade openness and poverty reduction. However, the WTO's accession and its policies offer some light to address this problem.

Although the Uruguay Round commitments on trading rules and market access varied among countries, depending on their level of economic development (Warr, 1997), countries' commitments were mainly determined by the WTO's Agreement. It is then exogenous in the sense that the government could arbitrarily restructure its own tariff system. This was the case for a small country like Thailand, as it could not influence the world to follow its own preference. In addition, incentives for developing countries could pose another issue. In the broad aspect of development, developing countries might have wished to join the WTO due to the

opportunity to engage in the dynamic global market. As MFA was phased out, WTO membership offered an opportunity for labour-abundant countries to gain from trade. As a result, in a broad picture, a poorer country may have wanted to join this international integration effort at the expense of its own tariff reductions. However, the model specification in this study does not allow us to shed light on this reverse causality because the level of analysis is at the provincial level in Thailand only. The estimated coefficients help to explain the difference between provinces that vary in the level of exposure to trade, as opposed to overall effect of trade liberalisation. Tariff rate (variable of interest) is weighted by a specific production composition at provincial level. As such, the weighted tariff is different in each province as it is weighted by the proportion of workers in sectors affected by tariffs. Nevertheless, as poverty may indirectly affect employment composition, an instrument variable estimation is employed to lessen this confound effect. However, the poor is likely to work at non-traded sectors, for example, construction, restaurant, cleaning, as well as the agricultural services. Wages in these sectors are relatively low when compared to those in traded sectors. Hence, traded tariff is used as an instrumental variable. It is calculated in the same way of non-traded tariff, but weighted only by the number of employees in the traded sector.

Finally, a location of the traded sector is purely a firm decision. We find no evidence that a firm's decision to locate their factories at specific area depends on poverty. Instead, firms are likely to locate in areas yielding highest profits or lowest costs, and/or near customers. As labour is mobile in Thailand, firms might not have a strong motivation to install their plants in the poorer provinces which are quite far from the capital to take the advantage of labour cost.

4.2. Model specification

Topalova's (2010) research adopted a difference-in-differences method from a unique natural experiment setting of rapid changes in India's trade policy in 1991.[13] The author used two types of tariffs in the estimations. Non-traded tariff (scaled tariff, see equation (1)) includes non-traded sectors such as services, trade, transport, and cultivation of cereals and oilseeds, while Traded tariff (non-scaled tariff, equation (2)) excludes the non-traded production sectors in the calculation.

$$Tariff_{dt} = \frac{\sum_i Worker_{d,i,t} Tariff_{i,t}}{TotalWorker_{d,t}} \quad (1)$$

$$TrTariff_{dt} = \frac{\sum_i Worker_{d,i,t} Tariff_{i,t}}{\sum_i Worker_{d,i,t}} \quad (2)$$

where $Tariff_{dt}$ is the district level of tariff at time t and $Worker_{d,i,t}$ is the share of workers involved in district d and sector i at time t .

The distinction between these two types of tariffs is crucial to estimation. Because non-traded tariff includes all the non-traded sectors before trade liberalisation began, it can be assumed that it is related to initial poverty levels of the districts. However, traded tariff includes only traded sectors and is not related to the size of the industry to which the tariff applies and therefore is not related to the income or poverty situations of the district. Based on these assumptions, the author used traded tariff as an instrumental variable for non-traded tariff under the assumption that traded tariff is strongly correlated with the non-traded tariff, but not correlated with initial poverty conditions of districts. The basic model specification (3) and the first stage equation (4) are as follows:

$$y_{dt} = \alpha + \beta * Tariff_{dt} + Post_t + \delta_d + \mu_{dt} \quad (3)$$

$$Tariff_{dt} = \alpha + \beta * TrTariff_{dt} + Post_t + \delta_d + \varepsilon_{dt} \quad (4)$$

[13] Trade reform in India in 1991 is exogenous as it was sudden and externally imposed by the IMF.

where y_{dt} is either the poverty rate or logarithm of mean income associated with district d at time t and δ_d and $Post_t$ control for district and time fixed effects, respectively.

4.3. Background of difference-in-differences: Trade policy reform in India (Topalova, 2010)

Like in other developing countries, India's trade policies had been tailored to foster import substitution industries by restricting imports to a large extent after the World War II. However, this trend had undergone a significant transformation in 1990s after the Gulf War, which forced substantial changes in their trade policy. With the rapid changes in the international economy, such as skyrocketing oil prices and plummeting export demand, India had to resort to IMF's relief which was conditional on an adjustment program that required major changes in the economy of India. The requirements of the IMF's relief program included substantial tariff reductions, elimination of non-tariff barriers, and adoption of a flexible exchange rate system, which completely overturned India's trade policy that had been maintained up to that time. These radical changes in the Indian economy provide a crucial background for a unique natural experiment of the Topalova (2010) study. The timing of tariff cuts was sudden, unanticipated and externally imposed, so, due to this unpredictability, there were no systematic factors in the reduction of tariffs across products, and no linkage with the pre-reform characteristics was found. Figure A.I in the appendix shows the overall changes in weighted mean applied tariff rates of manufactured products, primary products, and all products between the period of 1990 and 1999 in India. As mentioned above, after the implementation of the IMF adjustment program in 1991, the tariff rates in all industries had fallen sharply, with manufacturing sector showing the greatest decline.

5. Results and analysis

5.1. Replicated results and robustness check

In addition to the poverty rate used as a primary dependent variable in main study, we used poverty gap for the purposes of robustness check, specifically the Foster-Greer-Thorbeck (FGT) class of poverty. It allowed us to put a heavier weight on the poor by highlighting the gap between poverty line (z) and individual income (y_i). The equation (5) shows that the gap is more weighted as it increases, and which indicates poverty head count (q) when $\alpha = 0$, poverty gap when $\alpha = 1$, and squared poverty gap when $\alpha = 2$.

$$FGT\ class\ of\ poverty = \frac{1}{N}\sum_{j=1}^{q}\left(\frac{z-y_i}{z}\right)^{\alpha} \quad (5)$$

Topalova (2010) reported that the tariff reduction resulted in a relative poverty increase of 0.71 percentage points in districts with the decrease in the scaled tariff of 1 percentage point in rural areas, and a relative increase of 0.60 percentage point in urban areas. In other words, in the areas experiencing tariff cuts, poverty rates declined less than the national decreasing trend of the poverty rate in both rural and urban areas (see Table 2). Using the different dependent variables, we find that in rural areas experiencing a 1 per cent tariff cut, the poverty gap reduced 0.26 percentage points less than the average and 0.18 percentage points less in urban areas. Overall, the effects of tariff reduction on poverty gap and FGT index are still significant, but the coefficients become smaller than the results using the poverty rate. When using the index measured by stricter standards that emphasise the difference between the poverty line and the individual's income, it is as expected that the size of the effect appears smaller. It should be noted here that the impact of tariff cuts on any index is higher in rural areas than in urban areas and these results are consistent.

Table 2: Extensions of Topalova (2010) in the context of India

Dependent	Poverty Rate			Poverty Gap			Squared Poverty Gap		
Var:	(1)	(2)	(3) IV	(4)	(5)	(6) IV	(7)	(8)	(9)
Rural Area									
Scaled Tariff	-0.24*		-0.71***	-0.10***		-0.26***	-0.03***		-0.06***
	(0.12)		(0.25)	(0.01)		(0.06)	(0.01)		(0.02)
Nonscaled Tariff		-0.22*			-0.08***			-0.02***	
		(0.08)			(0.02)			(0.01)	
N	728	728	728	728	728	728	728	728	728
Urban Area									
Scaled Tariff	-0.22		-0.60*	-0.08		-0.18**	-0.02*		-0.02**
	(0.30)		(0.31)	(0.07)		(0.08)	(0.01)		(0.01)
Nonscaled Tariff		-0.38			-0.12*			-0.02**	
		(0.24)			(0.06)			(0.01)	
N	127	127	127	127	127	127	127	127	127

Note: Clustered standard errors (based on year) are presented in brackets below coefficients. Columns 1, 4, and 7 are the coefficients from the OLS, columns 2, 5, and 8 are from the reduced form, and columns 3,6, and 9 are from IV estimation. ***, **, and * indicate significance at 1%, 5%, and 10%, respectively.

5.2. Trade liberalisation and poverty in Thailand

We first conduct an analysis of the overall impact of tariff cuts on poverty rates and mean incomes in Thailand (see table 3). Our results show that in regions exposed to tariff cuts, poverty rate fell further, and mean income increased more than the average. This result is contrary to the case study of India in Topalova (2010), which found that the decline in poverty rates in the tariff affected areas was less than average, meaning that the poverty rates decreased less than the national trend in India. Specifically, our estimation results for Thailand show that the poverty rate fell by 6.72 percentage points more in the areas exposed to the 1 per cent tariff cut, while the income increased by 6.04 percentage points further (see table 3). This result shows that not only the direction of the effect, but also the magnitude of the effect, are different from the case of India.[14]

[14] compare with column 3 in Table 2

Table 3: Effects of trade liberalisation on mean income and poverty rate in Thailand

Dependent Var:	Poverty Rate			Mean Income		
	(1)	(2)	(3) IV	(4)	(5)	(6) IV
Scaled Tariff	1.17**		6.72***	-1.83*		-6.04***
	(0.00)		(1.36)	(0.0)		(1.2)
Nonscaled Tariff		2.24***			-2.02***	
		(0.0)			(0.00)	
Year Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes
Province Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes
N	152	152	152	152	149	152
First Stage						
Traded Tariff (Nonscaled Tariff)	0.33***	0.41***				
	(0.00)	(0.00)				
Trade Tariff*Post		-0.3053***				
		(0.00)				
N	152	146				

Note: Clustered standard errors (based on year) are presented in brackets below coefficients. Columns 1, and 4 are the coefficients from the OLS, columns 2 and 5 are from the reduced form, and columns 3 and 6 are from IV estimation. ***, **, and * indicate significance at 1%, 5%, and 10%, respectively.

We further examine the effect in subsamples of different income levels by focusing on the top 20 per cent and bottom 20 per cent income samples. As reported in table 4, the impact of tariff cuts on income is higher in the poorer sample, more specifically, in the bottom 20 per cent sample, provincial income increased by more than 10 percentage points in areas exposed to a 1 per cent tariff reduction. On the other hand, the top 20 per cent sample shows a smaller, yet statistically insignificant effect. In addition, we examine the effect of changes in tariffs on the inequality index[15] by creating an inequality index with the bottom 20 per cent and top 20 per cent income data. The estimated coefficients are positive, but not significant.

Table 4: Effects of trade liberalisation on income distribution

Dependent Var:	Provincial Income					
	Bottom 20%			Top 20%		
	(1)	(2)	(3) IV	(4)	(5)	(6) IV
Scaled Tariff	-6.6126***		-10.4584*	-0.5824***		-1.6939
	(0.000)		(5.4696)	(0.000)		(1.1430)
Nonscaled Tariff		-3.4894***			-0.5652***	
		(0.000)			(0.000)	
Year Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes
Province Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes
N	152	152	152	152	152	152

Note: Clustered standard errors (based on year) are presented in brackets below coefficients. Columns 1, and 4 are the coefficients from the OLS, columns 2 and 5 are from the reduced form,

[15] We construct a new variable by dividing the income of the top 20 per cent (of incomes) by the bottom 20 per cent, known as a Kuznets ratio.

and columns 3 and 6 are from IV estimation. ***, **, and * indicate significance at 1%, 5%, and 10%, respectively.

Next, we analyse the impact of tariff cuts by area. This result also shows that in Thailand the effect was greater in urban areas, unlike in the case study of Indian, which had a greater effect in rural areas (see table 5). This might be due to the share of agricultural and manufacturing sectors. While agriculture accounted for more than 80 per cent in the base year in India, agriculture accounted for 37 per cent and manufacturing accounted for 13 per cent in Thailand. This implies that, in Thailand, manufacturing sector was more likely to be affected by tariff reduction than agricultural sector compared to the case in India. As such, because manufacturing industries are usually concentrated in urban areas, urban areas are more sensitive to trade liberalisation as our results show. This result is consistent with the statistics that the poverty rate in the central region declined by 80 per cent, while other areas by 40 per cent during the same period (see table A.I in the appendix). There are, however, some limitations on this result. The coefficient for OLS estimation with fixed effect of scaled tariff (not IV method) shows a different sign (see column 1 in table 5) and IV estimation result for rural samples is not significant (see column 3 in table 5). As such, in part due to the sample size limitation of in the urban area, caution should be exercised interpreting the results.

Table 5: Effects of trade liberalization on poverty rate and income in rural and urban areas

Dependent Var:	Poverty Rate			Mean Income		
	(1)	(2)	(3) IV	(4)	(5)	(6) IV
Rural Area						
Scaled Tariff	-0.37***		1.67	-0.84***		-2.88***
	(0.00)		(1.04)	(0.00)		(1.16)
Nonscaled Tariff		0.99***			-1.71***	
		(0.00)			(0.00)	
N	116	116	116	116	116	116
Urban Area						
Scaled Tariff	2.63***		3.07*	-2.82***		-4.62**
	(0.00)		(1.03)	(0.00)		(1.83)
Nonscaled Tariff		1.08***			-1.62***	
		(0.00)			(0.00)	
N	36	36	36	36	36	36
Year Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes
Province fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes

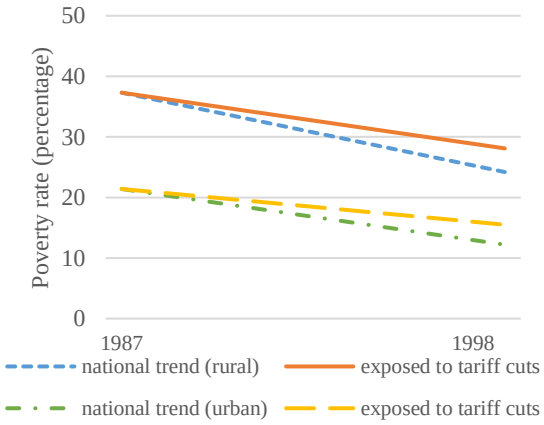
Note: Clustered standard errors (based on year) are presented in brackets below coefficients. Columns 1, and 4 are the coefficients from the OLS, columns 2 and 5 are from the reduced form, and columns 3 and 6 are from IV estimation. ***, **, and * indicate significance at 1%, 5%, and 10%, respectively.

5.3. Comparison between India and Thailand

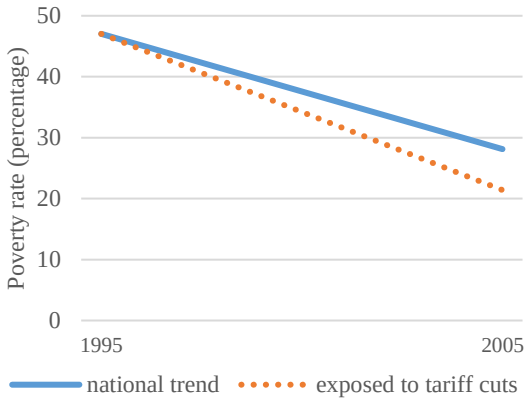
As the above estimation results show, India and Thailand experienced opposing results from tariff cuts. Figure 1 shows the differences between the two countries based on the results of the original paper and our case study. The blue and green dotted lines on the left show the changes in the average poverty rate in rural and urban areas in India. And the red and yellow lines passing above these two lines indicate the change in poverty rates in areas exposed to tariff reductions. According to the original paper's findings, in India, poverty rates decreased in regions exposed to tariff cuts less than the national trend both in rural areas and in urban areas. In other words, the poverty rate showed a relative increase in the regions experiencing trade cuts. Based on our results, we found that the effect of tariff cuts in Thailand went in a different direction. The graph on the right shows a decline in the average poverty rate in Thailand and a declining trend in areas exposed to tariff reduction. As reported in Table 3, if a region faces a 1 percentage point tariff reduction, the poverty rate in the region is on average 6.72 percentage points lower than the national poverty reduction trend. These results show that there is a large difference in the size as well as the direction of the tariff cut effects in the two countries.

Figure 1: Changes in poverty rate in India and Thailand

(a) Rural and urban in India



(b) Overall Thailand



Source: Authors' calculations

The result begs the questions: where does this big difference in the two countries come from? First of all, we need to look at the economic situation of the two countries at the time of the base year. Among many variables, 'openness to trade' is closely related to the effects of tariff cuts.[16] Here, we note that exports and imports are calculated as total value, and GDP is calculated as value added, so in countries that rely heavily on trade, this indicator can be greater than 100 per cent. Figure A.I in Appendix shows the changes in the index of openness to trade during the period of analysis in India and Thailand. In the case of Thailand, this indicator is seen to oscillate around 100 to 120 per cent, while in India it shows a gradual increase to around 20 per cent. Such a clear difference is perhaps one of the crucial factors that explains the magnitude of the tariff reduction effect. The economy that relies much on trade tend to be more sensitive to trade openness, which means that the impact of tariff cuts will be greater. In this respect, it is natural to see a larger effect in Thailand, which relies more on trade.[17]

Next, how do we explain the effect of tariff cuts moving in the opposite direction? In the original paper, the author payed particular attention to 'factor mobility'. In India, the labour rarely moves across industries and regions due to labour laws, culture and norms. This lack of mobility of labour limited the effects of trade liberalisation measures, or rather it caused the opposite effects. The effect of factor mobility and its impact on trade liberalisation and poverty is explored in more detail in the following section. However, in short, in a situation where labour cannot move across regions and industries freely, tariff cut is likely to have an adverse impact on their income, while if labour is free to move geographically and across industries, tariff cuts will make industries grow and increase workers' incomes.

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[16] According to the definition of the World Bank, *trade openness is the sum of exports and imports of goods and services measured as a share of gross domestic product.*

[17] Using the same methodology, it can be further examined by interacting the trade weighted by employment as an explanatory variable.

6. Discussion

Trade can affect poverty in several ways. The most conventional channel is that trade causes economic growth and it consequently improves the well-being of citizens resulting in poverty reduction. However, this channel does not precisely explain the adverse effects led by trade openness and how the structure of the economy ameliorates or deteriorates these effects.

6.1. Channels of the results

Our paper offers two channels aimed at explaining the result. The first one is a prediction from the Heckscher-Ohlin (H-O) model. The core of the model is that the differences in factor abundance between two countries drive trade. These differences result in different prices of commodities. After trade, their relative prices converge. A new world relative price of the commodity will be at a point between the pre- and post-trade relative prices. A convergence of relative prices (changes in prices) poses a critical effect on earnings among factors of production. In the case of the economy of Thailand, labour will be better off due to an increase in demand for labour-intensive goods after the trade. On the other hand, the owners of capital will be worse off. Thus, in general, unskilled labour tends to benefit from trade openness resulting in poverty reduction. This result is consistent with Chaipan et al., 2006, Warr, 2009, Strutt et al., 2010.

The second channel is reallocation of labour from an import-competing sector to an exporting sector. This is known as the ‘adjustment process.’ Trade openness can adversely result in a shutdown of high-cost firms. A relatively high price among domestically produced goods is not competitive enough when trade allows an inflow of lower cost imports. As a consequence, domestic firms may be forced to reduce their size or shut down. This feature may, at least in the short run, raise unemployment. In addition to a firm decision, workers themselves have an incentive to move to the high-paid booming exporting sectors as well. The result on poverty depends on the ability of these workers to migrate across production sectors. If a factor of production is immobile, the specific factors model is likely to

explain the result.[18] The model predicts that factors of production that are stuck in the import-competing industry tend to lose from trade. In several cases, this model can describe the distributional outcome of trade in the short run while the long-run impacts can be explained by the H-O model. In the case of India, rural districts experienced a slower poverty reduction and lower consumption growth partly because labour was immobile across the production sector in India (Topalova, 2010). It is consistent with a study by Winters & Martuscelli (2014), who argued that labour immobility prevents the equitable distribution of gains from trade. They also suggested that policymakers should put more attention to encourage mobility.

However, it is not likely to be the case in the context of the economy of Thailand because labour across the country is highly mobile. Jitsuchon (2014) calculated the migration rate among population aged 15 and over using Thailand's Migration Survey Reports and found that migration in Thailand was active around the 1990s to the early 2000s. In 1994, migration rate was around 40 per cent of total population. However, it declined steadily to only 10 per cent since 2000. According to the National Statistical Office of Thailand (2017), internal migration in 2002 was 5.72 million.[19] It gradually declined to 1.46 million in 2012. In 2016, only 0.77 million migrated. Even though the number of internally migrated people fell throughout the years, the main reason for migration is still employment seeking (see table A.II in the appendix). Interestingly, job-related reasons hold the highest share among the stated reasons for migration. In 2002, 28.03 per cent of migrants stated that they relocated due to job-related reasons, for example, finding and changing job. This share fell slightly to 26.06 per cent in 2012 and rose again to 34.70 per cent in 2016. Additionally, different from the case of India, we do not find either laws or regulations that restrict migration or employment across the production sector or geographically. Thus, it is evident that labour can freely move across industries in the country.

[18] Developed by Samuelson (1971) and Jones (1971).

[19] The oldest available data from the official source.

6.2. Discussion of results by income levels and geographical areas

Additionally, our result also suggests that the bottom 20 per cent of earners (the poor) have greater mean income increase than the top 20 per cent of earners (the rich). The heterogeneous effect on mean income suggests a decline in income inequality due to trade openness. Table A.III in the appendix presents Thailand's Gini coefficient (based on expenditure) calculated by the NESDB in 2017. In 1994, the Gini coefficient in Thailand was, on average, 0.438. It declined sharply to 0.409 in 1998. Following the Asian Financial Crisis, there was a slight increase in Gini coefficient to 0.428 in 2000, before plateauing and fluctuating around 0.42 until 2006. After that, the Gini coefficient continually fell with a small increase between 2011 and 2012 partly due to a big flood in Thailand. After joining the WTO and trade reforms under the Uruguay Round, the Gini coefficient in Thailand was expected to decline. Even though it seems consistent with our result from 1995 to 2005, it is not certain that a decrease in inequality was necessarily due to trade openness. Several studies state that trade liberalization in Thailand caused an increase in income inequality. A formal investigation by Warr (2014) using a general equilibrium model found that liberalization in Thailand increased inequality within the country despite dramatic poverty reduction, and argue that the Gini coefficient increased due to an increase in trade openness. The result is more pronounced when liberalization covers all traded commodities, compared to just agricultural products since skilled labour gains more than unskilled labour. Additionally, a study by Kohpaiboon & Jongwanich (2014) suggested that the wage skill premium, defined as the wage difference between skilled and unskilled labour, can be widened by a cut in output tariffs. They argued that the reasons are either an increase in the demand for skilled labour or a decrease in the need for unskilled labour. However, the finding is reverse for importing firms where a cut in input tariffs is likely to reduce wage skill premiums. As income inequality can be viewed and empirically assessed in numerous ways, our study thus does not suggest a causal relationship between trade openness and economic disparity.

Our study also finds a surprising result of poverty reduction in different regions. As poverty in the rural area is, in general, higher than in the urban area, a positive economic shock, say, trade openness is expected to reduce poverty in the rural areas significantly. However, we find that poverty in urban areas declined more rapidly than in rural areas after Thailand joined the WTO. Also, mean income in the metropolitan areas is significantly higher than in rural areas. Even though an IV regression suggests an insignificant relationship between scaled tariff and poverty rate, the estimated coefficient in the rural area has a positive sign but far lower than in the urban area. According to table A.I in the appendix, it is indicated that poverty rate in the central region fell the most by 51.14 per cent within ten years, from 26.3 per cent in 1996 to 12.85 per cent in 2006.[20] The Northeast was the most impoverished region in Thailand where 47.72 per cent of the regional population lived below the poverty line in 2006. However, its progress in poverty reduction was disappointing, falling only to 25.98 per cent, below the national average. This evidence can support our argument regarding the heterogeneous outcome across regions. Moreover, our result in this section is consistent with the study by Krishna, Mitra, & Sundaram (2010) on working in India. They found that the effect of trade openness is associated with poverty reduction; however, this effect is nil in the lagging regions. The authors also conducted cross-country analysis and found that countries with a smaller share of people living in the lagging areas face a greater poverty reduction after trade openness. This lagging state or territory is physically impeded by a distance from ports and infrastructure resulting in high trade costs, and cannot reap the benefit from trade. For Thailand, even though the BOI has attempted for a decade to provide an incentive to both Thai and foreign firms to install their factories in rural areas in an exchange for generous incentives (Thailand Board of Investment, 2009), most of the industries are still locating around Bangkok. Due to a relatively high wage rate in this province and more opportunities, labour has been drawn from the rural to the urban area.

[20] From 1988 to 2008, NESDB published data only every even year.

Average incomes among these provinces, especially in the east region, are unusually high.[21] Poverty is, on average, reduced over time.

Nevertheless, there are several limitations in our study. The present study focuses on trade reform that occurred between 1995 and 2005. It cannot be viewed as an ideal baseline to study the effect of trade reform due to the fact that Thailand, as several other countries, participated in the GATT's Uruguay Round since 1986. This trade policy is thus not a sudden and an unanticipated policy shock. Agents and institutions had time to adjust.[22] Additionally, the definition of trade reform is limited solely to tariff reductions. Protection of trade in services, intellectual property rights, government procurement, non-tariff barriers, and other rules and regulations restricting trade are excluded. As the well-known function of the WTO is the dispute settlement mechanism that helps to encourage trade flow, it is difficult to quantify its effects on poverty. Moreover, we are also aware that the result from this study is somewhat difficult to generalize to other countries because of different policy reforms (whether it is exogenous) and economic structures (whether the trade has a significant role in the economy). Additionally, our mechanism relies on the effects of trade on production sector that consequently affects workers. However, trade expands not only production possibility frontier but also consumption possibility frontier in term of price and variety of commodities. Consumer's improved welfare is not fully explained in this paper.[23] Lastly, the effects of trade liberalization on poverty, as explained earlier, are due to a movement of workers from import-competing industries to exporting industries based on the assumption that relatively high-cost, inefficient firms cannot compete

[21] However, according to Li and Gibson (2013), household survey and subsequent measures of inequality normally address only residence and do not take into account temporary migrants. A period an individual has actually been living in a locality can affect the result from survey data in China. For Thailand, there is no additional note, except location, in the household survey regarding the residency of sample.

[22] It is thus different from the India's trade reform in 1991 that was unexpected, sudden, and externally imposed (Topalova, 2010).

[23] A study by Treichel et al. (2012) reveals that trade protection through import ban has an adverse effect of the poor, especially when many of the banned goods are necessities strongly demanded by the poor. An elimination of the ban can get the poor out of poverty through consumption.

with relatively low-cost and more efficient foreign firms. However, the economy also benefits from cheaper intermediate inputs. Hence, a cut in tariff can lower domestic firm's production cost and firms can be more efficient resulting in an expansion of output and employment. The producer will demand more labour resulting in a higher wage. As such, poverty can be further reduced.[24]

7. Conclusions

Along the path of economic development, developing countries have implemented a wide range of policies. Some economies succeed, some failed, and some are in transition, resulting in the dispersion of economic development.

However, in the era of international economic interdependence, both developed and developing countries have participated in international economic integration, some more actively than others. The first step, in practice, is to become a member of the World Trade Organization. Its key mandate is to liberalize and encourage the global trade. There are numerous costs and benefits at the same time. Countries can benefit from the most-favoured-nation treatment and the dispute settlement mechanism. However, they are required to reform their tariff structure, implement tariffication and relevant legislation, and reform other measures restricting trade. Numerous studies rigorously examined the effects of trade and generally found positive outcome from trade openness. Economic growth is a conventional channel that can improve the lives of the poor. Nevertheless, this powerful mechanism is difficult to generalize in some economies due to their unique characteristics, for example, factor immobility, rigid laws, political system, and culture.

[24] Kis-Katos & Sparrow (2015) distinguished the effects of trade reform on Indonesian labour market from a cut in output tariffs and input tariffs (tariffs for intermediate inputs). They found that poverty reduced in the districts with a greater sector exposure to input tariff reform. Input tariffs are calculated by using input coefficient from Indonesian input-output table. However, due to a time constraint in producing this paper, we did not derive input tariffs and examine the effects.

The present paper used Thailand's accession to the WTO in 1995 to investigate the impact of trade openness on poverty and income, and to analyse the mechanisms fuelling this impact. Variation in production composition across provinces allowed a study of a relative impact. Using the instrument variable estimation, we found that provinces in which employment was concentrated in industries exposed to greater tariff reduction experienced more poverty reduction, and more income growth, than less exposed provinces. The results also suggest a reduction in economic disparity after trade reform although it is not likely to conform to previous research. Additionally, the impacts on poverty and income are more pronounced in urban areas. It is consistent with the fact that poverty has declined more rapidly in the central region of Thailand. The findings of the relative impact of the 1995's trade reform can be explained by the Heckscher-Ohlin Model, in which labour is mobile, uninhibited by any laws and regulations, across provinces and production sectors. Even though internal migration fell over time, work-related reasons are still the primary factor among the migrants. An ability of labour, unskilled labour in particular, to relocate from import-competing industries to exporting industries is thus a critical factor underpinning the positive impact of trade liberalization. Nevertheless, our methodology stresses the heterogeneous impacts of trade openness across provinces, instead of the overall effect borne by the whole economy.

From a policy perspective, economic growth can be seen as a goal from participating in the multilateral trade negotiation and trade reform. However, the results from the prior study and our findings suggest that the unique features of the economy, for example, economic structure, internal laws and institutions, are essential to determine whether those trade policies will yield favourable or adverse impacts to the well-being of citizens.

Appendix

Table A.I: Poverty Rate of Thailand 1991 – 2017 (by regions)

	1990	1994	1996	1998	2000	2002	2004	2006	2016	Δ1996 -2006	Δ1990 -2016
Central	51.79	35.91	26.30	27.40	28.75	23.42	18.80	12.85	5.20	-80.23	-89.96
North	58.36	45.74	40.24	38.78	49.08	41.03	33.29	26.11	9.83	-75.57	-83.16
Northeast	69.16	53.26	47.72	55.28	59.28	44.16	38.97	35.32	12.96	-72.84	-81.26
South	65.81	48.01	35.60	40.73	41.70	29.20	22.89	19.84	12.35	-65.31	-81.23
Thailand	57.97	42.54	35.25	38.63	42.33	32.44	26.76	21.94	8.61	-75.57	-85.15

Source: National Economic and Social Development Board (2018)
Note: From 1990 to 2008, poverty rates are published only every even year.

Table A.II: Reasons for migration

	2002	2004	2005	2011	2012	2013	2014	2015	2016
Finding job	20.11	13.40	10.15	15.11	11.83	13.85	14.54	15.75	14.30
Changing job	2.43	2.58	3.92	2.69	2.49	3.07	4.02	3.83	5.30
Seeking for higher income	0.00	2.02	2.00	2.11	2.66	1.62	2.09	1.98	1.80
Other job related	5.49	5.40	4.45	5.97	9.09	7.52	12.43	13.72	13.30
Education	5.49	7.06	4.68	4.10	6.15	5.63	6.56	7.92	6.40
Living	9.94	10.53	9.42	9.48	9.62	10.40	11.93	10.65	17.50
Returning home	24.89	22.03	27.27	22.78	24.24	26.78	16.24	14.95	14.10
Following family member	27.44	28.44	27.39	25.16	25.61	21.45	21.44	21.76	18.20
Others	4.22	8.54	10.72	12.61	8.32	9.69	10.75	9.44	9.10
Total	100	100	100	100	100	100	100	100	100

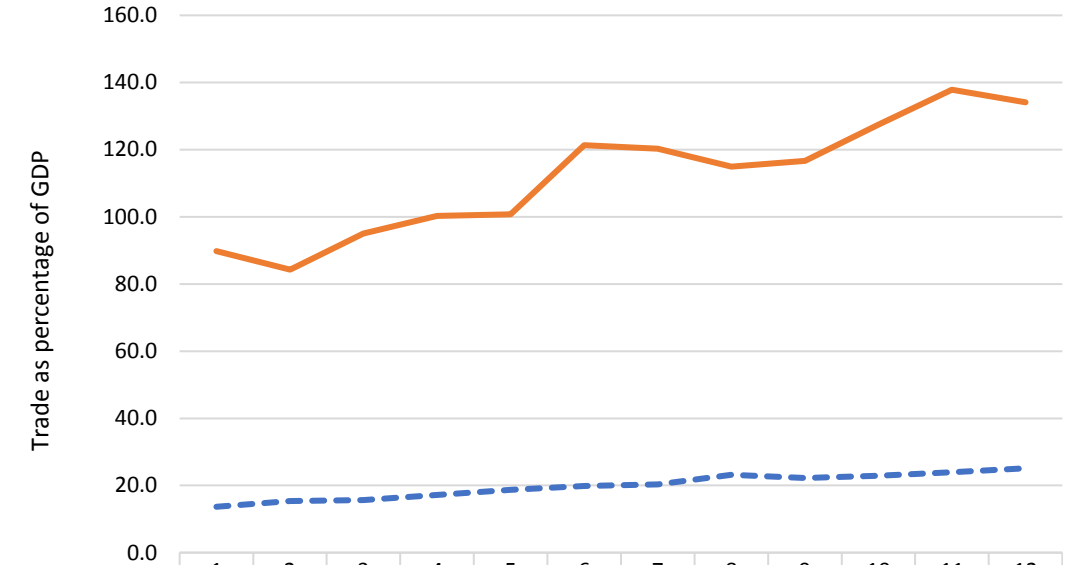
Source: National Statistical Office of Thailand (2017)

Table A.III: Gini coefficient (expenditure) from 1988 to 2016

Year	Thailand	Bangkok	Central	North	Northeast	South
1988	0.439	0.363	0.377	0.395	0.388	0.377
1990	0.443	0.384	0.386	0.411	0.382	0.361
1992	0.450	0.393	0.372	0.39	0.396	0.374
1994	0.438	0.364	0.373	0.398	0.391	0.398
1996	0.431	0.348	0.360	0.387	0.378	0.374
1998	0.409	0.326	0.335	0.358	0.343	0.361
2000	0.428	0.329	0.366	0.375	0.352	0.374
2002	0.419	0.365	0.357	0.384	0.356	0.368
2004	0.425	0.359	0.363	0.409	0.382	0.389
2006	0.420	0.362	0.355	0.410	0.399	0.374
2007	0.398	0.344	0.340	0.385	0.373	0.371
2008	0.405	0.357	0.344	0.387	0.374	0.351
2009	0.398	0.343	0.347	0.370	0.371	0.363
2010	0.396	0.354	0.341	0.389	0.385	0.353
2011	0.375	0.398	0.325	0.349	0.353	0.343
2012	0.393	0.368	0.339	0.353	0.349	0.370
2013	0.378	0.333	0.332	0.346	0.340	0.345
2014	0.371	0.338	0.317	0.328	0.351	0.354
2015	0.359	0.343	0.310	0.310	0.338	0.347
2016	0.367	0.337	0.319	0.329	0.329	0.361

Source: National Economic and Social Development Board (2017)
Note: From 1988 to 2008, Gini coefficients are published only every even year.

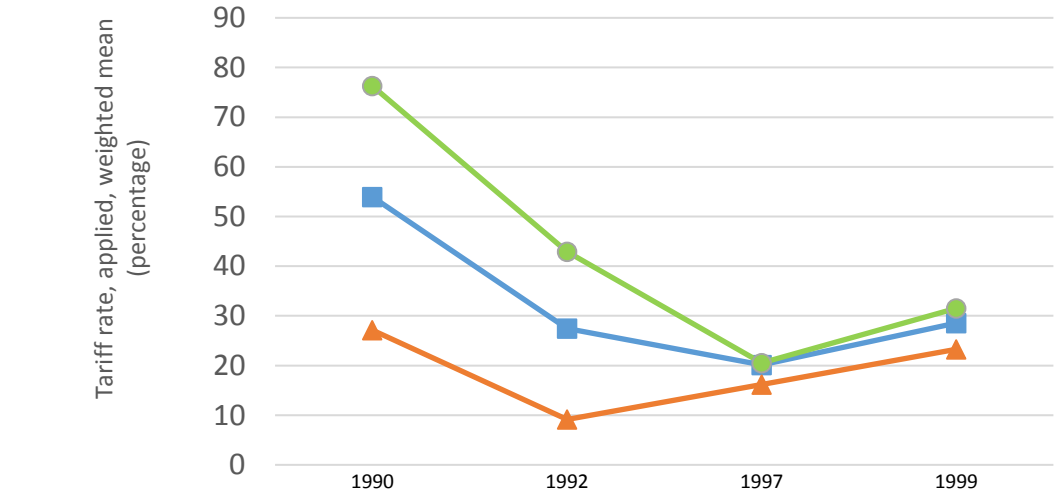
Figure A.I: Openness to Trade



	1	2	3	4	5	6	7	8	9	10	11	12
Thailand	89.8	84.3	95.1	100.2	100.7	121.3	120.3	115.0	116.7	127.4	137.9	134.1
India	13.7	15.4	15.7	17.2	18.7	19.9	20.3	23.2	22.2	22.9	24.0	25.1

Source: World Bank (2018)

Figure A.II Tariff Rate Changes in India



	1990	1992	1997	1999
all products	53.95	27.47	20.13	28.55
primary products	27.13	9.14	16.19	23.29
manufactured products	76.28	42.92	20.52	31.48

Source: World Bank (2018)
Note: Primary products are commodities classified in SITC Standard International Trade Classification) revision 3 sections 0-4 plus heading 68 (nonferrous metals) and Manufactured products are commodities classified in SITC revision 3 sections 5-8 excluding heading 68.

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