

Global Value Chains and Poverty: A Random Effects Approach to ASEAN and OECD Comparisons

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ABSTRACT

There has been a lot of debate on the effects of participating in GVCs and poverty, the relationship between developed and developing countries. This study endeavors to enhance comprehension regarding the nexus linking GVC involvement and poverty levels, dissecting GVC participation into two components: This is in addition to forward and backward participation. Further, it aims to examine the role of education, with education being disaggregated into literacy levels in the context of the relationship between GVC participation and poverty levels in both OECD and ASEAN regions. Using Random Effects regression of panel data covering 26 countries over the period 1995 to 2018 confirms that forward participation has a mixed effect on poverty depending on the country categories and their education level. On the other hand, backward participation shows a tendency of reducing poverty level in ASEAN countries.

Keywords: Poverty, Global Value Chains (GVCs) participation, education

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Introduction

Theoretical views suggest that international trade improves the allocation of resources, reduces the cost for consumers and stimulates productive efficiency. Moreover, it increases international integration and embracing of superior technology which enhances greater output (Alcalá & Ciccone 2004; Badenier, 2008). Therefore, international organizations support the policy changes that promote trade liberalisation for enhancing growth and welfare.

Different empirical researches prove that there is a significant positive relationship between trade openness, economic development and poverty decline (Edwards, 1993; Frankel and Romer, 1999; Sachs and Warner, 1995; Winters, McCulloch, McKay, 2004). The negative effects of trade openness are mainly seen in short and middle run adjustment processes. However, it should be noted that long run impact on poverty and inequality due to trade openness has also been admitted.

Various research shows that trade liberalisation has a positive impact on the development of the economy in the developing world (Irwin, 2019). However, these outcomes depend on the type of trade reforms and the living standards of the vulnerable poor persons (Winters & Martuscelli, 2014). In the past, the interaction between globalisation and economic growth depends on a bundle of co-factors that may affect trade benefits (Meissner, 2014).

Global Value Chains are now recognised as one of the most significant structural characteristics of the contemporary global economy and an important type of globalisation affecting production, trade and consumption. They entail unbundling of production operations across national borders, allow countries to focus on the tasks that they do best in a bid to increase productivity and viability (OECD, n.d.). Therefore, the extension of GVCs allows developing countries increase their per capita earnings and ultimately, help many people to come out of the poverty bracket (Dollar et al., 2013). GVCs are an important part of the current global economy where the design, production, assembly and distribution of goods and services are spread across various countries. For this reason, crucial opportunities exist for development-oriented countries to expand participation in GVCs and diversify exports. If a developing country did not have access to GVCs, it would require the capacity to produce an entire product to move into a new sector (World Bank, 2019). This removes entry barriers into international markets building upon comparative advantage to engage in specific production stages. Therefore, they can shift their production focus to increase exports penetration, improve engagement with the international market, generate employment opportunities and in the process maybe reduce poverty levels due to job creation within the country.

The integration into GVCs provides countries with new outlets, better technologies, and a wide spectrum of skills. However, the value added by GVCs is distributed inequitably and depending on certain factors such as the education levels among the population. At the same time, education, as one of the key factors affecting human capital formation, determines the rate of a given country's economic and social development. An understanding of various levels of education and participation in GVCs is important and totally can define economical and social perspectives of a country (Taglioni & Winkler, 2016). The relationship between GVCs, education and poverty has attracted significant attention in economics and development literature. The purpose of this study therefore is to establish the effect of engaging in GVCs and education level on poverty in both OECD and ASEAN countries.

It is not a phenomenon that can be argued anywhere in the world today that education remains one of the most effective weapons against poverty. It prepares many people for employment demand and provides them with knowledge to enhance their standard living. But the correlation between education and poverty can be complex, especially given GVCs kind of structure.

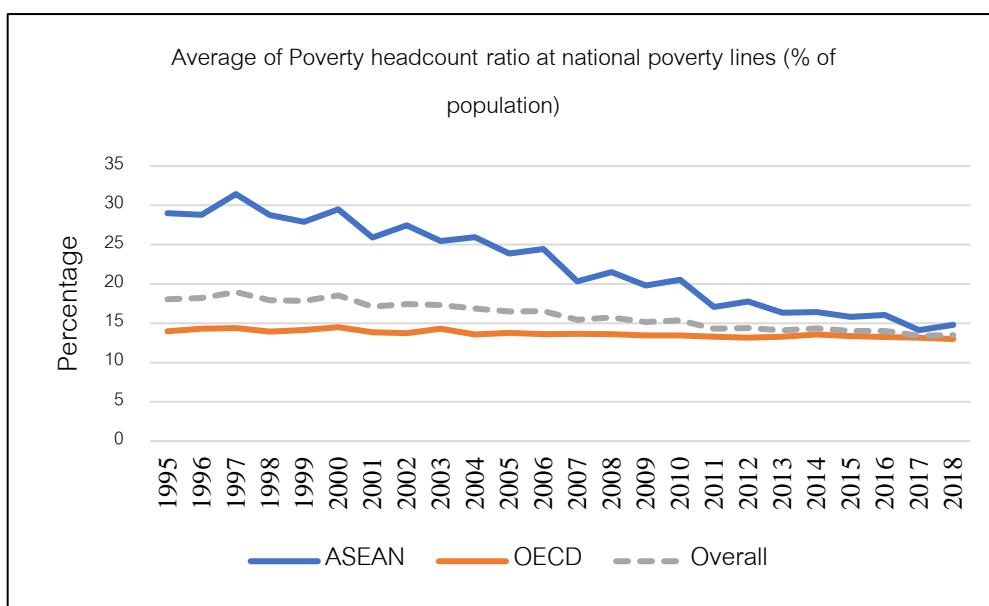


Figure 1: Poverty headcount ratio at national poverty lines (% of population)

Looking at the poverty trends of the entire world in the past year, it can be noted that there seems to exist a general reducing trend of the poverty rate in most world regions. From the analysis, it is clear that countries across the globe are working hard to lower poverty levels persistently. This reduction in poverty is as a result of several factors and requires a multifactored approach. Perhaps the most observable and dominant aspect is trade

liberalization, but this has to be pointed out that it alone is not sufficient to resolve the problem. Furthermore, the contribution made by GVCs in the poverty reduction debate has not been given much attention.

Based on the discussions made in consideration of the aforementioned areas, GVCs participation appears to be something that could help solve the poverty issue. Therefore, the purpose of this research is to carry out a comprehensive investigation with regard to OECD and ASEAN countries. Most of the OECD members are developed countries, which provide a stark contrast to the ASEAN countries that are experiencing a relatively fast rate of economic growth. This paper aims to offer useful comparative information on how different economic environments affect the relationship between GVC participation, education, and poverty.

In this study, it is planned to examine the level of engagement of OECD and ASEAN member countries in global value chains and analyze the role of education to identify possible opportunities and risks related to such engagement. With regard to the research questions and hypotheses the investigation seeks to determine how engagement in global value chains and differences in the educational levels of various groups of countries could lead to employment creation, training and development, and technology transfer chances, all of which could lead to poverty reduction. Several empirical literature has analyzed the complex relationship between different socio-economic factors and poverty decrease, which is crucial for those policymakers and stakeholders who are interested in the realization of the effective poverty reduction strategies. Specifically, trade, GVCs and education have been areas of interest in various analyses investigating their effects on poverty.

The relationship between trade openness, GVC engagement, and poverty is not well understood. Some work, including Lee (2014) and Le Goff & Singh (2014), suggest that higher trade openness leads to higher poverty rates, while other work, including Lopez-Gonzalez et al. (2015) argue that GVC dynamics could impact wage inequality and thus poverty. Likewise, the linkage between GVC participation and poverty has got more than one dimension. Carpas & Martínez-Zarzoso (2022) posit that an increase in the stock of skilled labour in offshoring countries may result in short term rise in poverty and income disparity. On the other hand, Cai et al., (2022) concluded that GVC might help reduce inequity due to the creation of employment chances especially for developing countries. Also, the World Bank (2020) emphasizes that GVC has positive effects in the economic transformation and presents productivity improvement and employment rate increase. In Hollweg's study (2019), the author focuses on the role played by export growth in the poverty-reducing impact in Vietnam.

Furthermore, the knowledge of how education relates to poverty has been a critical concern of different researches. Tilak makes use of diverse educational type and its impacts on poverty, on the other hand, Awan, Malik and Waqas 'Study of the association between poverty incidence and higher education level with special

reference to Pakistan'. Moreover, through contextualization of education, it is found that educational advancement results in poverty reduction but, according to Tilak (2007), the poverty warriors may not sufficiently reduce from basic literacy. The literacy rates have been found to predict poverty reduction in Bakare's (2011) study but it still indicates the need for other skills to be integrated in poverty fight.

Besides GVC trade and education, such variables as GDP per capita, inflation, governance, private participation, unemployment, private credit, and corruption have complex relationships with poverty. Research by Jeanneney and Kpodar (2011), Dollar and Kraay (2002), Easterly and Fischer (2001), Chetwynd et al. (2003) and so on, has revealed various effects on poverty. These papers demonstrate how economic growth, financial liberalization, inflation, governance and corruption affect poverty levels for better or worse.

Literature Reviews

Trade, GVCs, and Poverty

Several studies, including those of Lee (2014) and Le Goff & Singh (2014), associate higher poverty rates with trade openness particularly in poor nations. Winters et al (2004) also have an opinion suggesting that poverty rates may increase if the demand for professional employees outweighs that of unskilled ones. This accords with the observation made by Lopez-Gonzalez et al. (2015) that offshoring high-skill tasks may lead to high wages inequality and therefore increase poverty.

On the other hand, Carpa & Martínez-Zarzoso (2022) argue that increased skilled labour supply in offshoring countries may decrease the demand and wages for low skilled labour, thus raising short-term poverty and income inequality. Additional intricacy is contributed by Buracom (2021), whose study reveals that the trade effect on poverty depends on the level of income inequality; trade reduces poverty in low inequality countries while it increases poverty in high inequality countries.

Cai et al. (2022) have also argued that offshoring may reduce inequality, given that the employment of people in the lower income earnings from the developed nations will be offered job opportunities to work in the developing countries. Lewandowski et al. (2023) add another dimension by stating that the import of intermediate products could reduce costs, increase demand for labour, generate employment for low skilled workers, and possibly decrease both poverty rates and wage inequality in developing countries.

The relationship between GVC participation and poverty is evidenced by studies arguing that it stimulates economic growth in developed as well as the developing country, technology transfer, access to markets as well as FDI. Such participation can foster industrialisation, generate employment and possibly even cut poverty levels

(OECD, n.d.). Backward GVC participation in a higher degree is associated with lower wage inequality and by knowledge transfer and skill investment might reduce poverty and wage disparities in developing countries especially in less skill intensive activities (Lopez-Gonzalez et al., 2015).

According to the World Bank (2020), GVC expansion has more economic advantages in terms of increased productivity than traditional trade growth. Greater production efficiency and international specialization and acquisition of superior or cheaper inputs result in higher and higher efficiency and output. Global value chain enterprises are known to source a more extensive population and also enhance the total employment proportions (World Bank, 2020).

In terms of poverty, the GVC participation began with labour-intensive activities and was beneficial to wages, especially for the unskilled labour intensive sectors such as the textile sector. For example, poverty declined noticeably in Vietnam after exports to the USA after the US-Vietnam Bilateral Trade Agreement in 2001 (Hollweg, 2019).

Education and Poverty

Tilak (2002) examines the intricate connection between education and poverty by exploring three educational development approaches: primary requirements, human capital and human development. It emphasizes the fact that such relationship is quite sophisticated and, while showing that education reduces income poverty, it also stresses its weaknesses. Further, Awan, Malik and Waqas (2011) discuss the 'Effectiveness of Education to Reduce Poverty in Pakistan' and as we have seen earlier the level and experience of education has negative relationship with poverty rate; particularly with males. From Wedgwood's observation (2007), merely getting children into school may not help to eradicate poverty because the quality of education is wanting as evidenced in Tanzania. Previous efforts aimed at the achievement of UPE did not bring about much improvement in poverty eradication or in the quality of education. The expansion of secondary education is regarded as essential but its process should be controlled not to harm the quality of education. According to the World Bank, the development of educational sectors must be integrated in order to achieve educational relevance and quality.

According to Fernandes, Kee, and Winkler (2020), they highlight the roles of education, poverty and their association with GVC. More precisely, the study shows that variables such as education levels affect a country's capability to engage in GVCs. Also, poverty can be used as a form of lock-in to these chains, which bring out the issue of the interconnection between poverty and GVC integration. They provide understanding of the diverse processes in the world economy and their impact on integration and development.

Education has poverty reducing effects at both the macroeconomic and household levels. Tilak (2007) notes that when literacy levels are low in a given country, the lack of higher level skills continues to keep living standards low. On the other hand, better education leads to better employment chances and better remunerations – a straightforward positive addition to poverty relief (Michaelowa, 2000). Chaudhry and Rahman (2009) observed a positive relationship between household literacy and poverty level suggesting further enhanced synergy of education and poverty.

Similarly, in the works of Bakare (2011) Tilak (2007) there is support to the notion that poverty reduction correlates with education level, job opportunities and productivity. However, Batul et al. (2019) argue that literacy may not in of itself be enough to reduce poverty levels and that other skills and experiences should be promoted.

The relationship between trade, growth, and poverty has been described in many works (Lee, 2014; Le Goff & Singh, 2014; Winters et al., 2004; Lopez-Gonzalez et al., 2015; Carpa & Martínez-Zarzoso, 2022; Buracom, 2021; Cai et al., 2022; Lewandowski et al., 2019). These papers show that there is no one-size-fits-all rule regarding the effects of such factors as income distribution, types of trade, and, particularly, composition of the skilled labour force on the varying outcomes across one country or another.

Methodology

To be able to establish the impact of trade on poverty levels it is important to put the following questions into consideration. This research would like to compose the macro data. The empirical analysis is done by using a panel data for counties that are collected from a group of 10 counties from ASEAN but the author can get data of only 7 countries because some countries do not have complete data between 1995 and 2018. Secondly, group of OECD countries, Currently there are 38 countries in OECD group. However, some countries also do not have a complete data set in the period between 1995 and 2018. There are 25 finalized countries that have been chosen to do the study. The periods of dataset are from 1995 to 2018. However, because of the scarcity of available data, the data set is not balanced. In total, 32 countries have been gathered.

This research the collected data as poverty, is Poverty headcount ratio at \$2.15 a day (2017 PPP) by % of population in the country i (this model refers to countries from ASEAN and OECD) in year t . Then, this research set main independent variables are as follows: GVC participation and level of education. The GVC participation was further analyzed into Forward participation: GVC forward participation and Backward participation in GVC. For the level of education, this research also split education levels by using Literacy is youth literacy rate and Tertiary is school enrolment tertiary rate of the population to find poverty rate. For control variable also added s that are

commonly used to determine poverty rate: The variable income per capita or GDP per capita was used to control for economic development, Inflation is consumer price index which added to control macroeconomic instability, Private credit by % of GDP is a variable of financial deepening, unemployment rate is a variable for Domestic policies, while control of corruption measures the public power and bureaucratic regulation of government.

Model specification

The equation 1 shows that how poverty ratio comes the function poverty is an indicator that represents value of 1 if the condition inside bracket is correct which means the person is in the condition of being poverty based on the national poverty line. y_i is personal consumption and Z is the poverty line. Therefore, N_p is the sum of people who are under the national poverty line, and N is the total population. The term national poverty line shows that each country may set the different value of poverty line based on the conditions inside each country. The random effect is used for finding results.

$$poverty = \frac{1}{N} \sum_i^N F(y_i < z) = \frac{N_p}{N} \quad (1)$$

In this research, the GVC participation of each country, for each year is obtained from Tiva in OECD stats. The GVC participation is made up of two key index which is DVX and FVA. DVX is called domestic valued added in export, measure for forward participation which decide the exports of intermediate product that is used in making export products in another country or exported to third country. For the FVA, we have the foreign value-added measure for backward participation that estimates the value added of imported intermediate inputs that are used to create output for export.

Koopman et al., (2014) opine that Value Added (VA) is a better measure of domestic value than the Domestic Value Added (DVA). They claim that DVA counts domestically produced content in intermediate exports that circulate back to the home country, thus over-counting within official trade statistics (Koopman et al., 2014). As suggested by this view, our computation of gross exports involves addition of two components, namely Foreign Value Added (FVA) and Domestic Value Added (DVA). This approach is consistent with the method used by Ignatenko et al. (2019) who found that countries that engaged in GVC have a high income per capita and productivity.

$$GVC participation_{it} = \frac{DVX_{it} + FVA_{it}}{Gross Export_{it}} * 100 \quad (2)$$

The equation 2 shows that measurement of GVC participation. In this research GVC participation can be decomposed into GVC forward participation and backward participation. Therefore, to investigate which GVC participation can affect the poverty. The final models are demonstrated below.

Equations 3 illustrates that the measurement of poverty will be inversely related to GVC forward participation.

Equation 4 represents that the measurement of poverty will differ from GVC backward participation. Authors will quantify how poverty impacts from different variables, by highlighting, authors will quantify it from GVC forward and backward participation and then the other variables according to the literature review above.

Results and Discussions

Table 1: Descriptive Statistics

Variable	Observation	Mean	Standard Deviation	Min	Max
Poverty headcount ratio	624	16.04	9.30	0.157	50.2
GVC Forward	624	18.92	6.07	7.55	44.04
GVC Backward	624	27.34	9.94	6.03	51.09
Literacy Rate	624	94.90	6.81	70.51	99.89
Tertiary	624	50.78	24.46	1.26	97.42
PGDP	624	20510.64	20875.93	103.62	103553.80
Inflation	624	4.33	6.41	-1.71	58.45
Private Credit	624	81.50	47.50	3.47	304.57
Control of Corruption	624	0.55	1.02	-1.86	2.45
Unemployment	624	6.35	4.69	0.13	26.09

When checking where to choose either Fixed Effects model or Random effects, author choose Hausman's specification test. After running both FE and Re, as Prob > chi2 = 0.9576 from Hausman's test shows that the model is appropriate to use RE.

The regression results presented in Table 2 indicate that higher forward participation is associated with lower poverty levels in OECD and ASEAN, aligning with findings by Carpa and Martínez-Zarzoso (2022). This correlation is attributed to increased domestic value-added production, higher profits, wages, and employment in both OECD and ASEAN regions. Moreover, the literacy rate significantly reduces poverty in OECD and ASEAN. This finding is consistent with studies by Tilak (2002) and Awan, Malik, and Waqas (2011), which highlight that literacy enhances access to employment opportunities and better wages, thereby lowering poverty rates. Inflation rates, on the other hand, exhibit a positive impact on poverty only when considering all countries collectively. Conversely, private credit shows a negative relationship with poverty in both OECD and ASEAN, implying its role in poverty alleviation. Additionally, control of corruption is positively associated with poverty in OECD and ASEAN, this may shows tha. For ASEAN countries, however, the negative coefficient suggests that educated populations can leverage participation in global value chains (GVC) to effectively reduce poverty, as noted by Le Goff and Singh (2014).

Table 2: Determinant of poverty rate by type of forward participation and Literacy

Variable	OECD FE	ASEAN FE
Constant	45.460 (11.272)	65.768*** (10.297)
Forward Participation	-0.129** (0.053)	-0.020 (0.142)
Literacy	-0.319*** (0.113)	-0.027** (0.122)
PGDP	-0.000*** (0.000)	-0.001*** (0.000)
Inflation	0.068*** (0.023)	0.083 (0.065)
Private Credit	-0.011*** (0.004)	-0.125*** (0.024)
Unemployment	0.038 (0.038)	-2.191*** (0.437)
Control of Corruption	1.259 (0.566)**	4.074* (2.216)
Observations	456	168
R-squared within	0.1072	0.4623

Notice: * refers to significant factor to the regression results, *** p<0.001, ** p<0.05, * p<0

Numbers in parenthesis is standard error.

In Table 3, the findings indicate a positive association between higher Backward GVC participation and increased poverty across OECD and ASEAN, aligning with Lopez-Gonzalez et al., (2015). Regarding education measured by the literacy rate, there's a significantly negative effect on poverty for OECD and ASEAN. Higher literacy rates correlate with reduced poverty rates, aligning with studies by Tilak (2002) and Awan, Malik, and Waqas (2011), indicating stronger labor quality and increased job opportunities. Easterly and Fischer (2001) have

studied this variable, emphasizing the importance of maintaining price stability to curb adverse effects on poverty rates as this result reveals inflation have a positive relationship. Private credit negatively impacts poverty significantly in both OECD and ASEAN, fostering financial sector development and investment opportunities, as detailed by Kpodar (2011), Le Goff, and Singh (2014).

Table 3: Determinant of poverty rate by type of backward participation and Literacy

Variable	OECD	ASEAN
	FE	FE
Constant	42.546*** (11.174)	75.075*** (10.446)
Backward Participation	0.061** (0.030)	0.202*** (0.0762)
Literacy	-0.326*** (0.113)	-0.306*** (0.113)
PGDP	-0.000 (0.000)	-0.001*** (0.000)
Inflation	0.084*** (0.023)	0.074 (0.063)
Private Credit	-0.013*** (0.004)	-0.094*** (0.024)
Unemployment	0.043 (0.567)	-2.486*** (0.419)
Control of Corruption	1.454** (0.567)	6.154*** (2.160)
Observations	456	168
R-squared within	0.1016	0.4122

Notice: * refers to significant factor to the regression results, *** p<0.001, ** p<0.05, * p<0

Numbers in parenthesis is standard error.

Policy Implementation

Building on the discussions about the impact of Global Value Chain (GVC) participation on poverty, our organization is implementing a policy to leverage GVC engagement as a tool for poverty alleviation in both developed and developing nations. This approach is informed by recent research, emphasizing the promotion of backward participation in GVCs due to its proven effectiveness in reducing poverty across OECD and ASEAN countries. Authors also recognize the nuanced relationship between forward participation in GVCs and poverty, which is influenced by educational disparities. To address this, we commit to enhancing access to quality education, with a particular focus on literacy and tertiary education, to maximize the poverty-reduction potential of GVC involvement. By prioritizing improvements in employment opportunities and wage structures within GVCs, our objective is to harness their capacity to reduce poverty and foster inclusive economic growth.

Conclusion

The discussion surrounding the effects of Global Value Chain (GVC) engagement on poverty has been extensive, especially in differentiating between developed and developing nations. This study aims to explore the relationship between GVC participation and poverty, examining forward and backward participation. It also delves into the impact of education, focusing on literacy and tertiary rates, in understanding this association within OECD and ASEAN countries. Findings from a panel data of 32 countries spanning 1995 to 2018 reveal a nuanced effect of forward participation on poverty, dependent on specific country groups and their education levels. In contrast, backward participation consistently demonstrates a poverty-increasing impact in both OECD and ASEAN. The study emphasizes that GVC participation affects poverty levels primarily through alterations in employment patterns and wage dynamics, underscoring their pivotal role in shaping poverty outcomes.

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