RESEARCH ARTICLE

NORTH AMERICAN ACADEMIC RESEARCH (NAAR) JOURNAL
2021 MARCH, VOLUME 4, ISSUE 3, PAGES 128-154
https://doi.org/10.5281/zenodo.4625092

Impact of Benefiting the Sri Lankan Economy in the Global Value Chain with Its Trading Partners

Maduranga Pushpika Kumara Withanawasam[1*], **Wang Shaoyuan**[1]

[1] College of International Trade and Economics, Dongbei University of Finance and Economics, China.

OPEN ACCESS

Accepted Mar 18,2021
Published Mar 21,2021

***Corresponding Author:**
Maduranga Pushpika Kumara Withanawasam

DOI :https://doi.org/10.5281/zenodo.4625092

Pages: 128-154

Funding: This paper received no any funding.

How to cite this article (APA):
Maduranga Pushpika Kumara Withanawasam, Wang Shaoyuan (2021). Impact of Benefiting the Sri Lankan Economy in the Global Value Chain with Its Trading Partners. *North American Academic Research, 4(3)*, 128-154. doi: https://doi.org/10.5281/zenodo.4625092

Conflicts of Interest
There are no conflicts to declare.

ABSTRACT

Sri Lanka's growth dilemma reveals a failure to create and begin new, more powerful productivity industries where Sri Lanka can face internationally and sustain higher earnings. That is a self-perpetuating problem, but one that could be overwhelmed by a mix of international investment gives new knowhow and effective coordination in the global value chains (GVCs). Therefore, is it possible to have a stable macroeconomic environment in the global value chain (GVC)? This paper aims to analyze the impact of the global value chain (GVC) on the macroeconomics environments in Sri Lanka. In terms of econometric analysis, data availability is time-series samples from 1990 to 2018 have been selected and cover all the available bilateral exports between 25 top export countries over the period above period in Sri Lanka. It is included in the world development indicators, the Eora database and other databases. The data employed the panel model, and also the Hausman test examines whether there are fixed or random effects of model acceptance. According to the findings, all models accept fixed effects. Also, there is a significant 1% to 10% correlation between GVC, TD and FVA, DVA, DVX and VAE. Furthermore, R^2 was above 90%, and F statistics were accepted as all models' value. This paper concludes that Sri Lanka maintains a strong relationship with the global value chain and trade among macroeconomic environments. Nevertheless, Sri Lankan policymakers need to address competition, investment, trade costs, and technological spillover. The new world is highly diverse and rapidly evolving. Therefore, Sri Lankan policymakers must carry on these strategies.

Keywords: Global Value Chain, Macroeconomics, Trade, Sri Lanka and Eora

Introduction

Sri Lanka is a total population of 21.8 million and a low-income country with a GDP per capita of USD 3,852 (2019)(The World Bank 2020). After 30 years of terrorism war that ended in 2009, the economy increased by an average of 5.3% during 2010–2019. Subsequent catching the peace returns and agreed policies of reorganizing and growth but the increase has reduced in the past few years. That is the reason why Sri Lanka was an upper-middle-income country with a GDP per capita of USD 4,102 (2018) shits to a low-income

country. In 2019, Sri Lanka had a negative trade balance of -5.144 in billions of US$. Besides, in 2019, the total export of 19.476 in billions of US$ and total imports of 24.57 in billions of US$. According to Figure 01, the current account positive trend can be seen. Also, that Foreign Direct Investment awoke in 2019. Finally, in 2019, the GDP of Sri Lanka is 84.009 in billion US$. It is indicated, Sri Lanka has reported a 2.283% annual growth rate. It was the lowest annual growth rate since the year 2001.

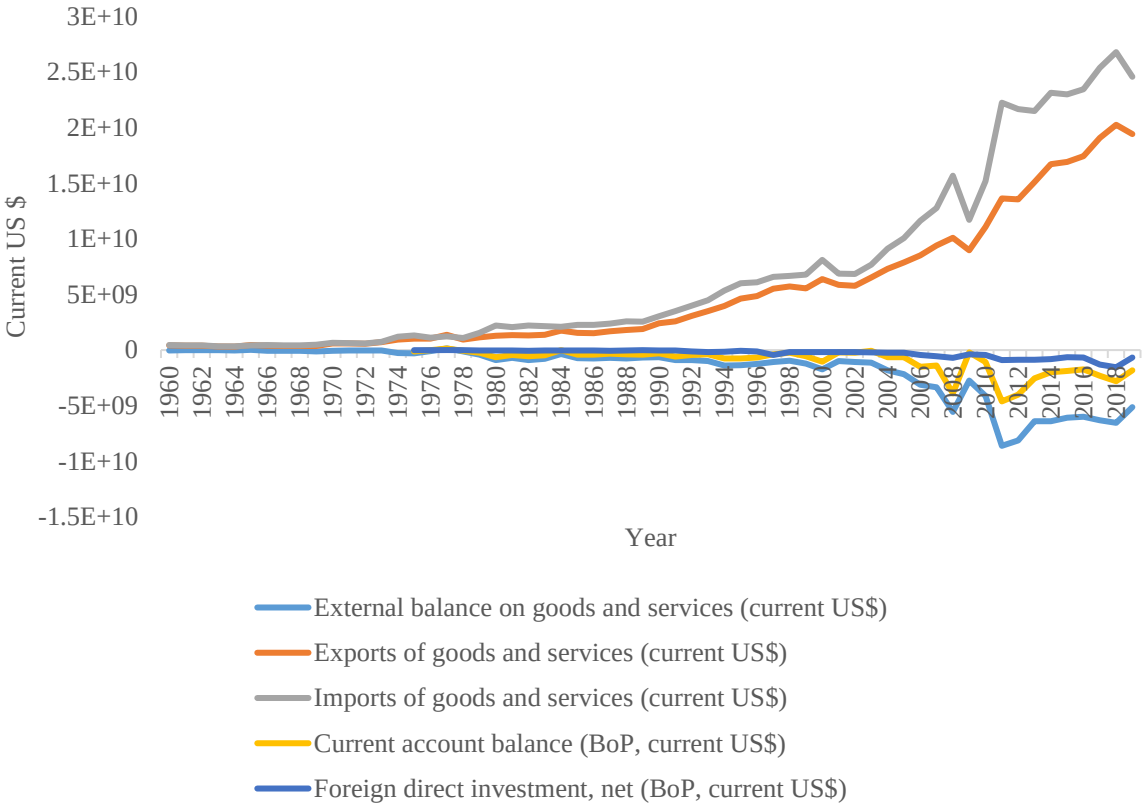


Figure 01: Trade of Sri Lanka

Source: Compiled by the author using https://data.worldbank.org/ database

According to Figure 01, The trade deficit widened to U.S. dollars 10,343 million in 2018 from U.S. dollars 9,417 million in 2012. The trade deficit as a percentage of GDP increased to 11.6 per cent in 2018 from 8.9 per cent in 2012. So, why has this happened?

According to Harvard (2018), Sri Lanka is performing healthy, but the increase reduced in 2014 to 2017. The report found out that Sri Lanka had a post-war growth acceleration that increased the current account shortage in an unsustainable form. In an international trading economy, exports must develop faster than import growth to maintain higher growth rates. These methods can be used in different ways; industrial goods diversification, servicification (Jones_Lin et al. 2019; Winkler 2016) and value-added industrial sectors by export.

Unfortunately, Sri Lanka has been many problems. First, Sri Lanka exported goods are not increasing fast enough because they have not expanded beyond traditional goods like tea, rubber products, and garments. According to Figure 02 (a) and (b), in 2018, Export of Sri Lanka and 2018 export destinations are represented.

There one can be proved because traditional goods lead in the Sri Lankan economy. According to Harvard (2018), Sri Lanka is a specialized textile and vegetable product manufacturer and has not maximized machinery and electrical products. The second one, there is another weakness. It is the Western Hemisphere, and it directly affects Sri Lanka. Sri Lanka exports goods to the US at 24.2%, and the Eurozone - 30% (Withanawasam & Wang 2020). It is a considerable risk for all of Sri Lanka's exports. Third, the Sri Lankan economy needs value-added goods and jobs. Fourth, Sri Lanka must need to be a global value chain participation.

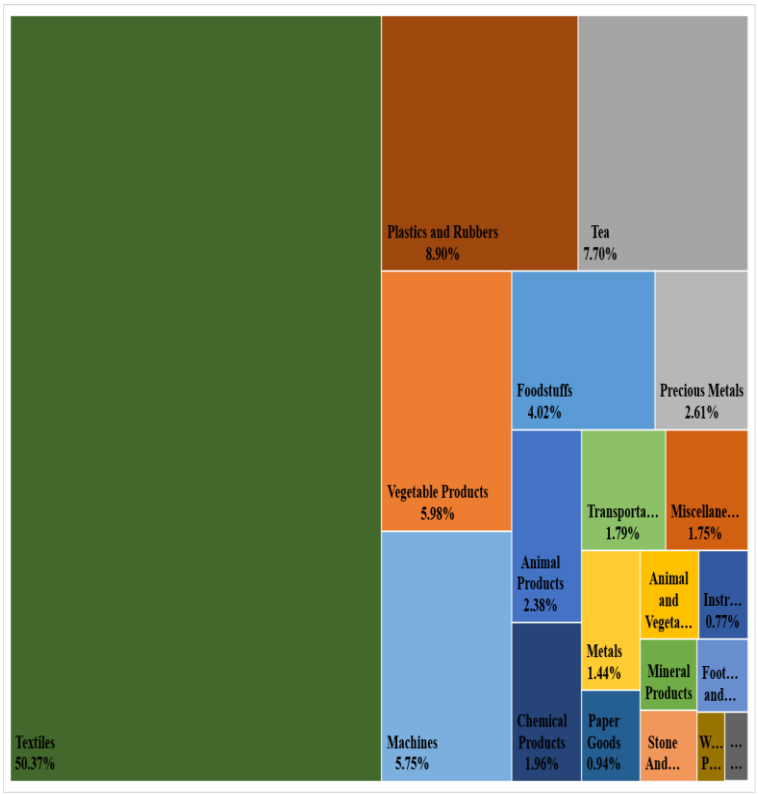


Figure 02 (a): Export goods of Sri Lanka Export Destinations of Sri Lanka

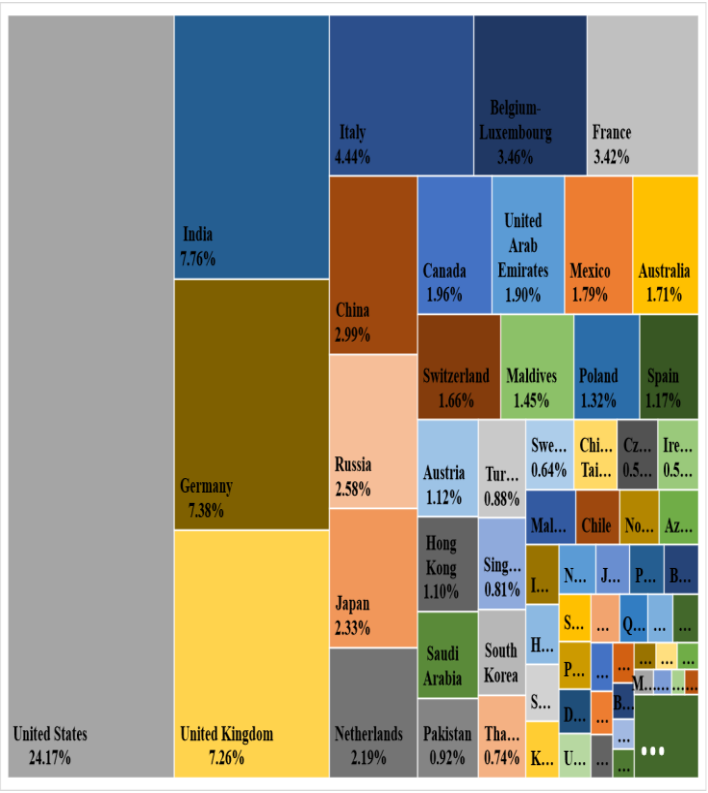


Figure 02 (b): Export Destinations of Sri Lanka

Source: Adapted by the author using the https://oec.world/en/profile/country/lka database

Next, Sri Lanka's growth dilemma reveals a failure to create and begin new, more powerful productivity industries where Sri Lanka can face internationally and sustain higher earnings. That is a self-perpetuating problem, but one that could be overwhelmed by a mix of international investment gives new knowhow and effective coordination in the global value chains (GVCs). Therefore, is it possible to have a stable macroeconomic environment in the global value chain (GVC)?

This paper aims to examine the impact of the global value chain (GVC) on the macroeconomics environments in Sri Lanka. The following specific objectives are expected to be achieved:

- To analyze the impact of the Global Value Chain on the Competitiveness in Sri Lanka.
- To identify the impact of the Global Value Chain on the Trade and Investment in Sri Lanka.
- To recognize the impact of the Global Value Chain on the Geographic factors in Sri Lanka.

- To examine the impact of the Global Value Chain on trade cost in Sri Lanka.
- To study the impact of the Global Value Chain on the technology spillover in Sri Lanka.
- To recognize policy recommendations that improve the global value chain (GVC) on the Trade, Investment and development nexus based on the empirical findings.

The article is structure in the following order: the second section contains the summary of the materials and methods, and the last section covers the Conclusion.

Materials and methods

International Trade is the trade of goods and services between any country in the world. Selling goods to another country is called export (export) trade and buying from another country is called import (import). International Trade takes place because a country cannot efficiently produce all the goods and services it needs in its own country. Each country specializes in producing better-producing goods based on the number of resources it can efficiently produce by exporting to its own country, and the surplus goods that cannot be produced are imported from other countries. For example, due to the favourable climate for growing tea in Sri Lanka, tea is grown efficiently, and its surplus is exported abroad.

On the other hand, goods such as cars, televisions and computers, which cannot be efficiently produced in Sri Lanka, are imported from other nations (Atapattu 2010). Today, every country in the world participates in international trade through imports and exports. If a country does not participate in international trade, it will have to become self-sufficient, producing everything it needs in its country.

However, the world was now producing goods and services. Take Apple iPhone and Boeing aircraft as examples. Apple iPhone was manufactured in the USA. However, the functions of the Apple iPhone are divided into different countries. However, Apple's U.S. headquarters is involved in basic and applied research and development, product design and supply chain management. Besides, labelling, brand management and after-sales services can be provided by Apple U.S. headquarters. In fig. 03 and 04 show that other countries mainly lead to product functions. This process is called the global value chain (GVC).

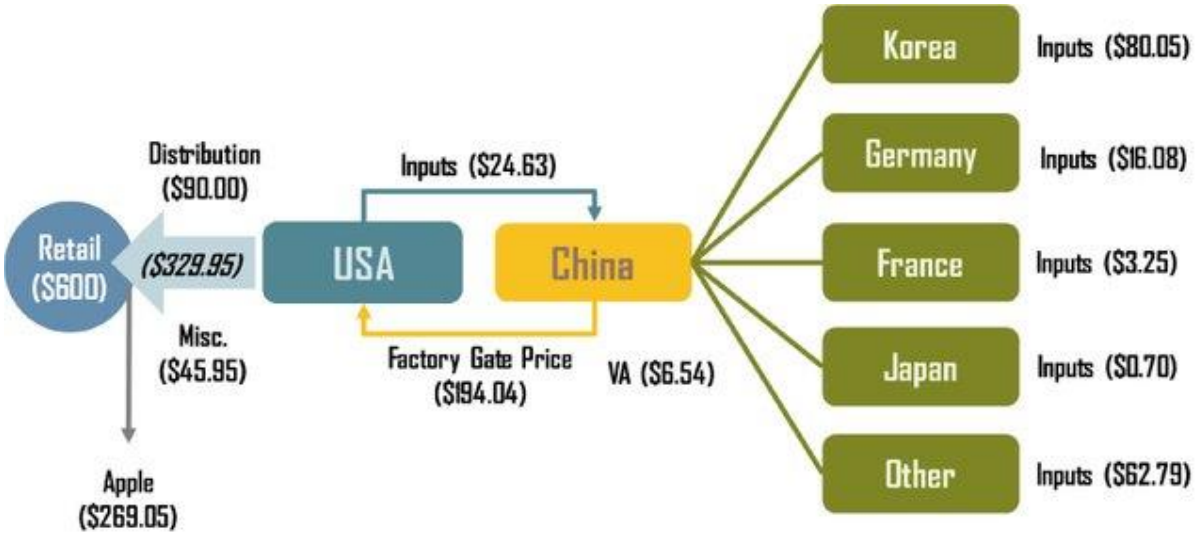


Figure 03: Global Value Chain for iPhone 4

Source: adapted from OECD (2011) "Global Value Chains: Preliminary Evidence and Policy Issues", Organization for Economic Co-operation and Development, DSTI/IND(2011)3, Paris, 2011.

Figure 03 illustrates the global value chain based on Apple's iPhone 4. According to Brennan (2015), value chain activities can be embedded in established clusters specialized in that particular activity in some cases. Therefore, a cluster analysis that reveals the extent to which a cluster is part of a global value chain or chains can provide essential insights into GVC participation. Global value chains are an implementation of globalization driven by flows of materials, goods, information, knowledge, finance and people. Global value chains are the backbone of such flows. The ongoing construction, destruction and reconstruction of such chains provide the infrastructure through which globalization takes place. The design, configuration and coordination of such chains to maximize business performance are central to multinational enterprises (MNEs). The integration of new technologies into such chains to create symbiotic business systems that maximize productivity is the key to competitive advantage in today's globalized world. Figure 04 illustrates Apple's smiling GVC curve, with several cores, minor, and assembly-related functions disaggregated at different points on the curve and worldwide. According to Giovanni Pino (2018) and Duhigg & Barboza (2012) explained, the iPhone is not made in America because there are not enough human resources to support Apple production.

Boeing aeroplane is another different approach to GVCs. Figure 05, overseas sub-contractors supply their exports in the value chain and Boeing USA headquarters could collect imported parts and assembled them. Therefore, currently, global trade situation like those types. Furthermore, the global value chain exciting topic in the world because the world has a chain, but any reason or breaks that chain could not be repaired.

While these fundamental analytical approaches provide many tools for better understanding how GVCs evolved and functioned, there are many nuances to exploring their local and global externalities. Because GVCs operate at such a high level, connecting the stages of production of various goods and services across time and space, their economic, social, and political effects vary depending on the unique combination of position and relationships in the value chain, production stage, location, and product type found in each of them. So far, the existing literature has attempted to examine the economic impact of GVCs through the lens of standard indicators such as economic development, trade, foreign direct investment, trade costs, and competitiveness.

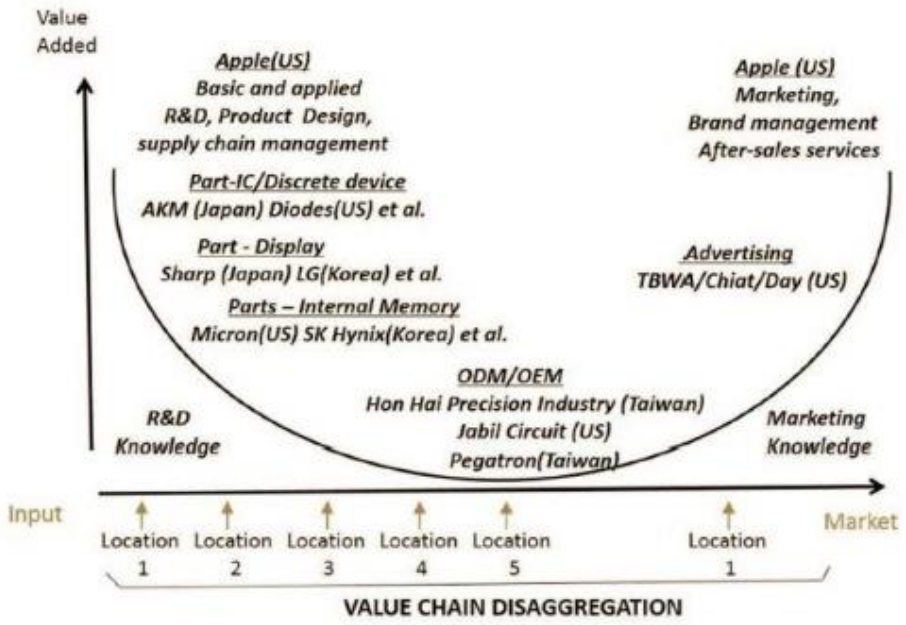


Figure 04: Apple's smiling curve and GVC

Source: Adopts from Grimes & Sun, (2016), (Sun & Grimes, 2016) *and* Mudambi, (2008)

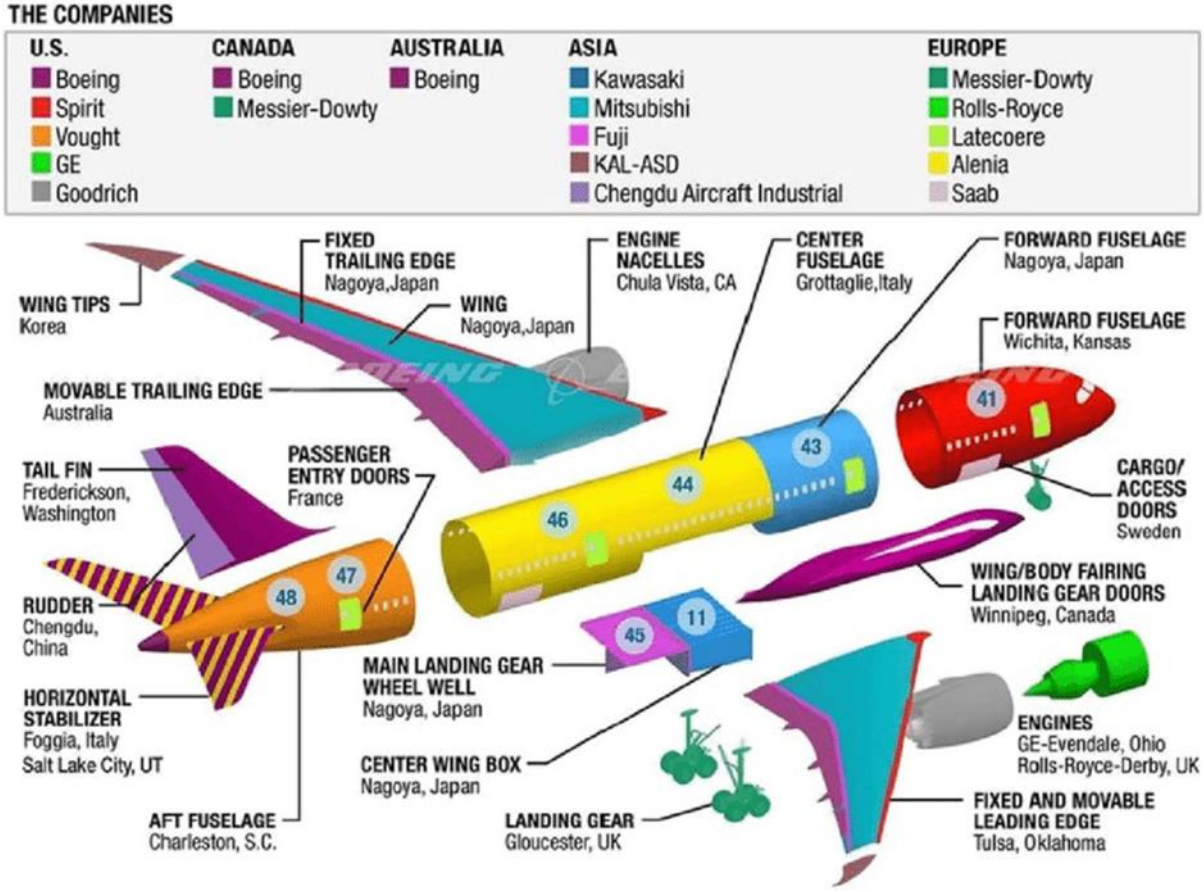


Figure 05: Boeing global value chain

Source: The Boeing Company

Competitiveness is both a cause and an effect of GVCs. To fully comprehend how GVCs affect competitiveness, the concept of GVCs must first be defined. The World Economic Forum (WEF), an international organization that has been measuring countries' competitiveness since 1979, defines competitiveness as "the set of institutions, policies, and factors that determine a country's productivity level" (Cann, 2016). At the micro-level, competitiveness is defined as a firm's ability to compete successfully in a given business environment and outperform its competitors in terms of profitability, sales growth, or market share (Porter, 1990(Lall, 2001). A firm's competitiveness is influenced by four major factors: (1) manufacturing and delivery capabilities, (2) manufacturing and delivery costs, (3) operational capabilities, and (4) product innovation and differentiation (David et al., 2018). Standard parameters for measuring competitiveness at the country or company level have long been relative productivity or efficiency (Reinert, 1995). Competitiveness is defined in international trade as a measure of a country's advantages or disadvantages in selling goods or services in the international market (OECD, 2007). Bela (1965) develops an Index of Revealed Comparative Advantage (RCA) based on traditional trade statistics to measure a country's relative trade efficiency and competitiveness by comparing its share of total exports to the global average sector in global exports. The resulting index indicates a country's comparative advantage (disadvantage) in the export of a product if the index value is greater (less than) one (Pelzman, 2016).

GVC growth has fundamentally altered the structure of international trade, and their emergence necessitates new approaches to measuring competitiveness in international trade. Standard GSP bids, which are presented in gross terms and thus double-count intermediate input trade flows, frequently overestimate or underestimate a country's comparative advantage. Recognizing the problem of double-counting in traditional trade statistics, (Koopman et al., 2014) and Wang et al. (2018) use the RCA approach to TiVA statistics and use domestic value-added rather than gross exports. They discover significant differences in the results obtained using these two measurements.

For example, using RCA standard indices, both China and India have significant revealed comparative advantages in the finished metal products sector, ranking first and fourth among the countries surveyed (Koopman et al., 2014) and Wang et al. (2018). When RCA value-added indices are used, however, the revealed comparative advantages of both countries and their ratings are reduced, while some other countries' ratings are increased. In this sector, India is even moving from a comparative advantage to a comparative disadvantage. Using a similar methodology, Escaith & Miroudot (2016) calculate the differences between standard GSP and sector-level GSP for 61 countries, and their findings show that the differences can be significant for some countries. Such revelations have sparked debate about broadening competitiveness measures in the context of GVCs to include market accessibility, productivity, training and research, infrastructure, and regulatory environment (Timmer et al., 2013).

The effect of GVC participation on competitiveness is dynamic and not felt uniformly. Small and medium-sized enterprises (SMEs), which account for 90% of all firms in most countries, face dual competitiveness challenges (Park et al., 2013). GVCs provide enhanced opportunities for agile SMEs to enter the global market in various manufacturing niches because SMEs are less burdened by massive production chains and bureaucratic processes. Small and medium-sized businesses in niche markets, on the other hand, face encroachment from larger enterprises with superior resources and market power (Park et al., 2013). Finally, competitiveness outcomes are determined by SMEs' ability to increase productivity, which is covered in the section on economic development that follows.

The rise of GVCs has ushered in a new era of international trade and economic development (Winkler, 2016). Policymakers are increasingly realizing that the economic benefits of participation in GVCs extend beyond the traditional notion of increased exports; benefits also include the transfer of technology and knowledge, the expansion of foreign direct investment, and the modernization of human capital. These advantages can lead to long-term productivity gains and long-term economic growth. Low- and middle-income countries (LMICs) are especially well-positioned to benefit from GVCs because their participation fosters skill development, which strengthens ongoing industrialization and "service" processes (Winkler, 2016). GVCs can stimulate productivity growth at the country or firm level through four channels: knowledge transfer, technology spillovers, foreign resources, and specialization. The expansion of global value chains allows for greater specialization in specific value chain activities (Criscuolo & Timmis, 2017). Participating firms can increase productivity by focusing on core tasks that require the most efficient allocation of resources and offshoring tasks that are less efficient (Grossman & Rossi-Hansberg, 2006). This specialization is aided by the expansion of intermediate foreign resources (Criscuolo & Timmis, 2017). Firms with comparative advantages in the value chain can participate as input suppliers to foreign firms via direct links and producers using foreign resources for production and export via feedback. GVC connections enable greater economies of scale in specialization and better utilization of cross-border complementarity. Participation in the GVC provides the local economy with not only competitive alternatives to domestic sources, but also a greater variety and quality of foreign resources (Amiti & Konings, 2005) (Topalova & Khandelwal, 2011)(Bas & Strauss-Kahn, 2015). These advantages of participation may result in increased productivity for firms that participate in GVCs. Participation in GVCs also enables local firms to engage more closely with 'open innovation' systems, as well as the advanced knowledge, technologies, and standards established by major GVC participants, resulting in a technology/knowledge spillover (Teece et al., 1997) (Sturgeon & Memedovic, 2010) (Ketels & Memedovic, 2008). These advantages can be obtained through three mechanisms in GVCs. According to the first mechanism, the diffusion effect, MNEs can assist local firms in exchanging knowledge and technology. The second mechanism, the impact on availability and quality, contends that participation in GVC improves the availability and quality of resources in the buyer's industry. The demonstration effect, the third mechanism, contends that technology and knowledge spillovers occur as a result of firms "imitating or reverse-engineering GVC products, business models, marketing strategies, manufacturing processes, and export processes"

(Winkler, 2016). While GVC participation allows developing countries to capture productivity gains in the global market, some countries may end up experiencing a slowdown in growth, also known as the middle-income trap (Escaith, 2017). According to the OECD, this slowdown can be offset by a shift to higher value-added activities within or between industries (OECD 2013). Depending on the country's comparable level of economic development, such modernization can be used to manage or improve its position in the world economy (Gereffi & Fernandez-Stark, 2016). Within the GVC, Humphrey & Schmitz (2002) identify four types of modernization: (1) process modernization; (2) functional upgrade; (3) product upgrades; and (4) chain or cross-industry upgrades. The modernization of processes and functions focuses on increasing productivity, such as increasing organizational or technological efficiency. When upgrading products and chains, particular attention is paid to vertical or horizontal movement along the value chain (Humphrey & Schmitz, 2002). The modernization of products and chains requires specializing in new tasks with higher added value (Humphrey & Schmitz, 2002). Bamber et al. (2014) present three possibilities for modernizing GVCs: entering the value chain, updating feedbacks, and modernizing the final market. Most literature uses an increase in export volume or unit value of export as a general measure of modernization (Milberg & Winkler, 2011).

Over the last few decades, many trade barriers have been eased or eliminated through unilateral trade liberalization, bilateral or regional trade agreements, and multilateral negotiations. However, especially in the context of the GVC, trade barriers continue to be an issue, with intermediate resources often crossing borders multiple times, and trade costs can accumulate in a cascade across the value chain (Rouzet & Miroudot, 2013) (Escaith, 2017) (Commission, 2017). Such trade costs include applicable customs duties, border taxes, transportation and insurance costs, and unadjusted regulatory measures. These costs increase production costs by an average of 18% at each value chain stage (Escaith, 2017). At the end of a five-tiered supply chain, Ferrantino (2012) found that an average 10% advertising value transaction value resulted in a complex advertising value tariff equivalent to 34%. As the number of production steps increases, the cumulative effect increases. As a result, as these costs build-up, the expected benefits of joining GVC diminish. Researches have explained that these barriers' cost is overly burdensome for downstream countries that display more foreign content in their exports (Escaith, 2017). As total value increases along with GVC, downstream industries usually face relatively high trade costs due to barriers, regardless of their added value (Ferrantino, 2012)(Rouzet & Miroudot, 2013). Pol Antràs & Gortari (2017) call this relationship between increasing downstream production and trade costs along the GVC "the elasticity of trade costs at a particular stage." The cumulative impact of trade costs on GVC affects both macro and micro, from the efficiency and externalities of a country's trade protection policies to the firms that decide the best places to produce. Diakantoni et al. (2017) found that asymmetric non-tariff measures (NTMs) such as regulations, licensing requirements, contractual and institutional flaws, and consumer preferences account for two-thirds of total trade costs. These NTMs are biased towards developing countries (Ghodsi & Stehrer, 2016). Using modelling, Diakantoni et al. (2017) found that trade costs reduced 27% of the highly integrated German automobile industry's gross profit. Besides, the reduction of direct tariffs on inputs from the mining industry will reduce the indirect tariffs faced

by downstream industries by 5-10 per cent (Diakantoni et al., 2017)(Ghodsi & Stehrer, 2016).

The improvement of GVCs and their economic impact on engaging nations, enterprises or firms have been widely discussed in the business and economic literature. This introductory paper discusses and highlights some of the key topics covered in the GVC literature to provide readers with broad coverage of relevant material to develop their understanding of GVC research. This document discusses the key concepts and basic analytical approaches commonly used in GVCs. It discusses important economic and technical factors contributing to the recent development of GVCs and highlights the characteristics inherent in many GVCs. This paper also discusses the economic implications of GVCs for economic development, trade, foreign direct investment, trade costs, and competitiveness.

The article mainly expected to deal with quantitative data such as Foreign Value Added (FVA), Domestic Value Added (DVA), Indirect Value Added (DVX), Value Added Export (VAE), Global Competitiveness Index, Gross Domestic Product (GDP) per capita, FDI, Land area, Distance, so on. and model develop and implement in the data. This study adopted an explanatory approach by using a panel research design to fulfil the research objective. The advantage of using panel data is that it helps to study each country's behaviour over time and across space (Gujarati, 2003). Furthermore, panel data are commonly used because it consists-of both the cross-sectional information, which detentions individual variability and the time series data, capturing dynamic adjustment to give more informative data. In other words, panel modelling supports identifying a joint group of characteristics and heterogeneity among individual units.

Conceptual Framework

International trade is a means of participating in global value chains. Figure 6 shows how the Global Value Chain (GVC) operates in the two countries' export systems. As a simple example: the first country, "A", exports goods to country "B". However, the value of exports is not real income to that exporting country, "A". For example, if the exporting country is a country that processes finished goods, it must extract the raw material from another country and export it to other (b) countries. There are eight ways to export goods in this process. This process is called the Global Value Chain (GVC).

Second, certain factors influence a country's global value chain. They can be divided into two parts. One part is economic growth, and the other part is social development. Economic growth factors include competition, international trade, FDI, geography, trade costs, technological spiller over, monetary development and financial development. Factors in social development are labour, poverty and the impact on the environment. The global value chain is a common factor.

Therefore, based on that background, Figure 08 shows the conceptual framework of the article. Nevertheless, due to the research problem, it has been allowed to examine the Global Value Chain (GVC) impact on the macroeconomic environment. Therefore, the database's social development factors can remove from the article (Figure 06 shows a red rectangle). Figure 07 illustrates the research process in this article.

Data Sources

According to the Economic Analysis, data availability time-series samples from 1990 to 2018 have been decided. Sri Lanka covers all bilateral exports between the top 25 exporting countries during the above period. It is involved in the World Development Index, the Eora Database and other databases.

Overall, at least 83% of Sri Lanka's exports go to the global market. The top 25 exporting countries are as follows: Australia, Austria, Belgium, Canada, China, France, Germany, Hong Kong, India, Italy, Japan, Maldives, Mexico, Netherlands, Pakistan, Poland, Russia, Saudi Arabia, Spain, Switzerland, Turkey, United Arab Emirates (United Arab Emirates), United Kingdom (United Kingdom) and United States of America (United States). The estimate covers 25 countries with four dependent variables and ten interpretation variables (total observations = 754, n = 26 and time = 29), and all variables are declared by the natural logarithm.

The following table (Table 01) presents the functional variables and data sources of this study.

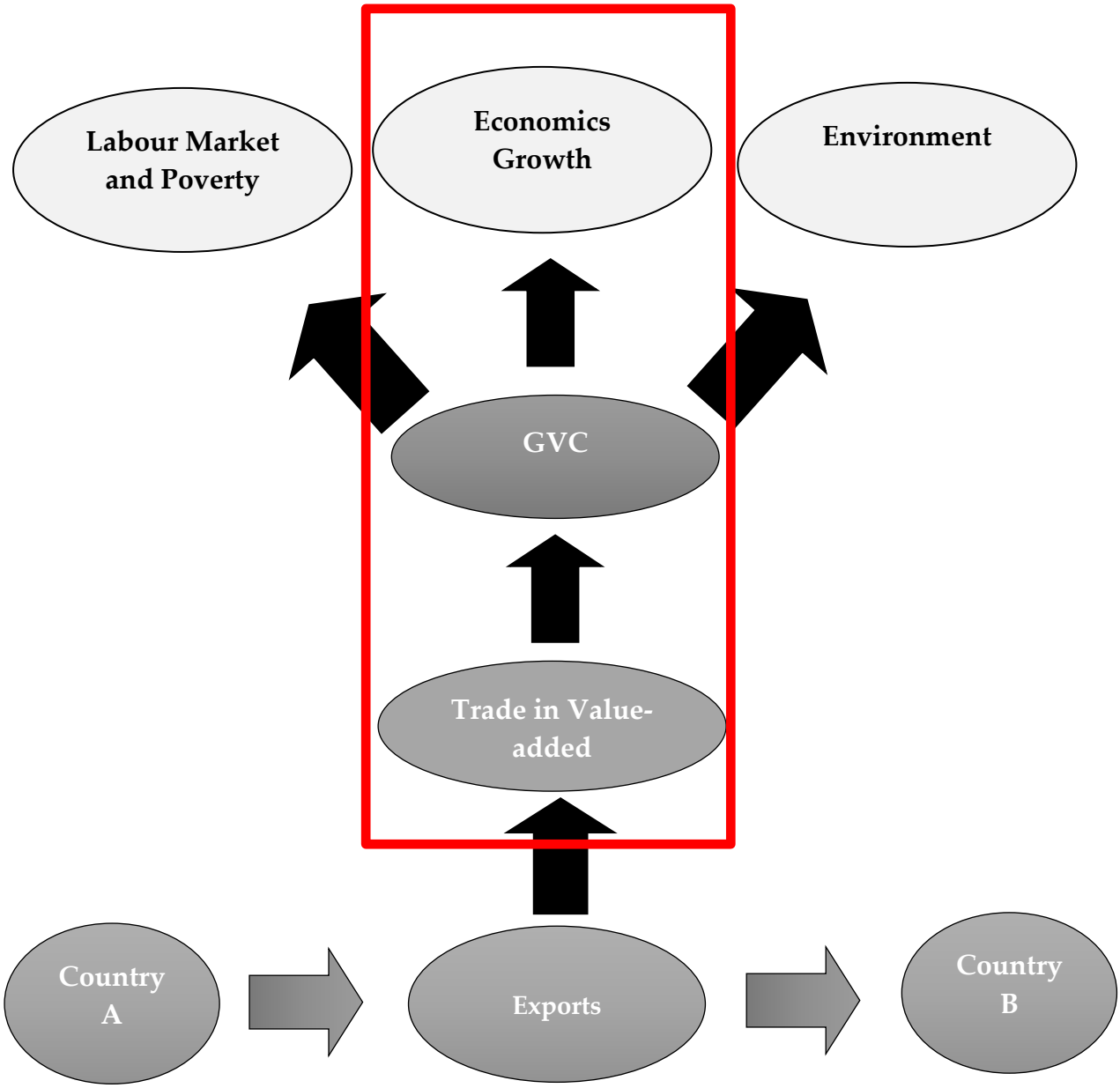
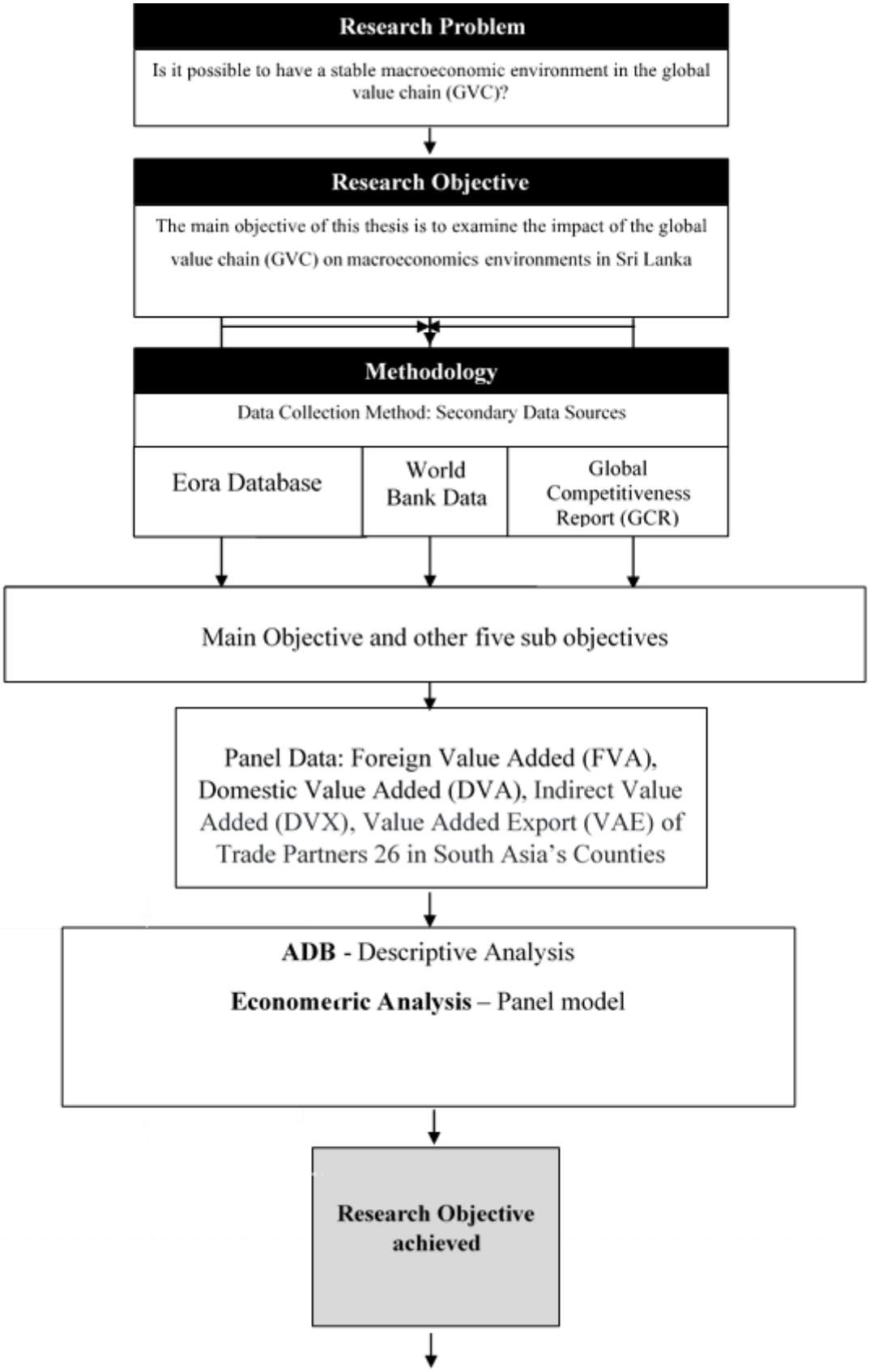


Figure 06: Background of Conceptual Framework of the Study

Source: Compiled by the author


Research Problem
Is it possible to have a stable macroeconomic environment in the global value chain (GVC)?
Research Objective
The main objective of this thesis is to examine the impact of the global value chain (GVC) on macroeconomics environments in Sri Lanka
Methodology
Data Collection Method: Secondary Data Sources
Eora Database
World Bank Data
Global Competitiveness Report (GCR)
Main Objective and other five sub objectives
Panel Data: Foreign Value Added (FVA), Domestic Value Added (DVA), Indirect Value Added (DVX), Value Added Export (VAE) of Trade Partners 26 in South Asia's Counties
ADB - Descriptive Analysis
Econometric Analysis – Panel model
Research Objective achieved

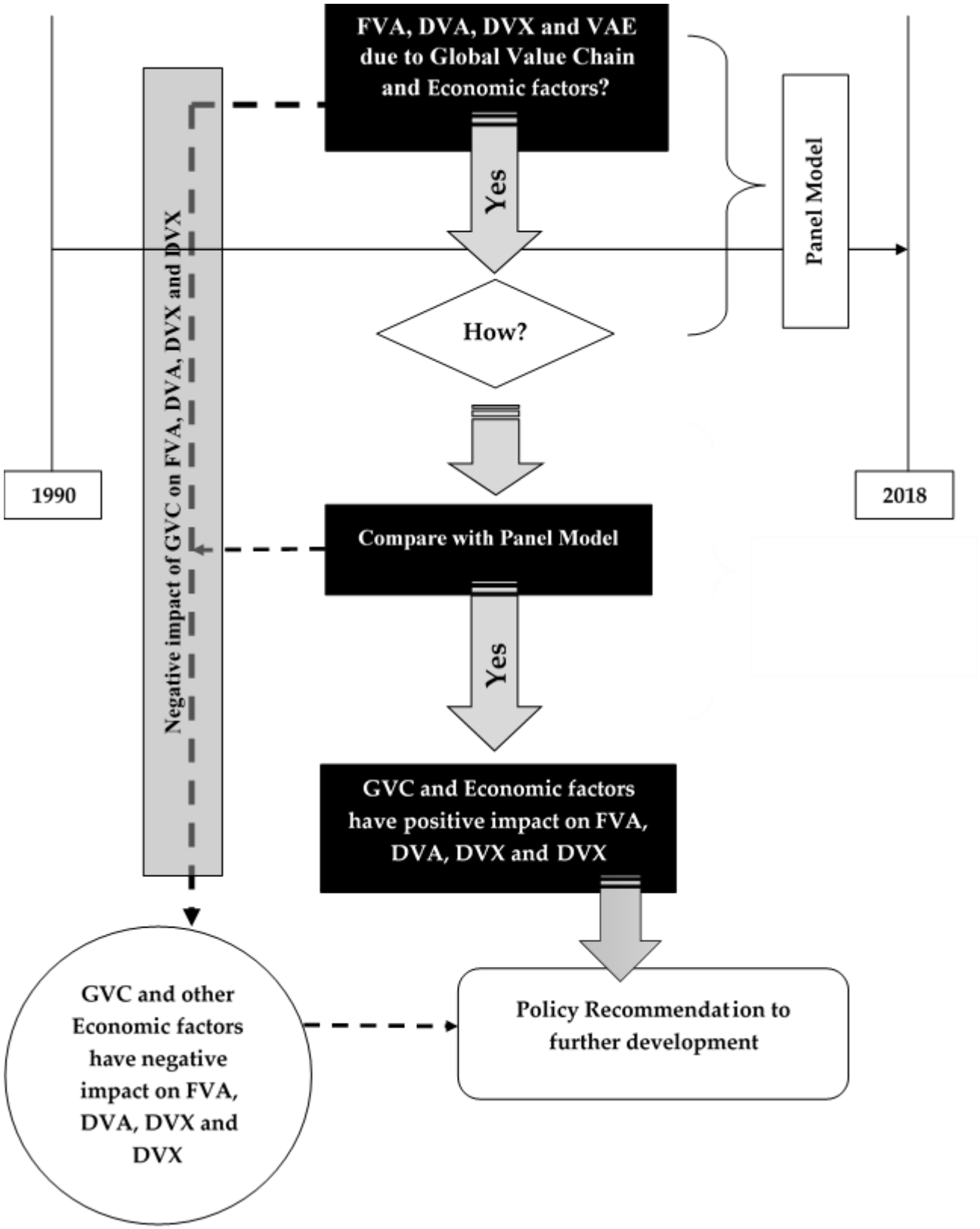


Figure 7: Research Process

Source: Compiled by the author

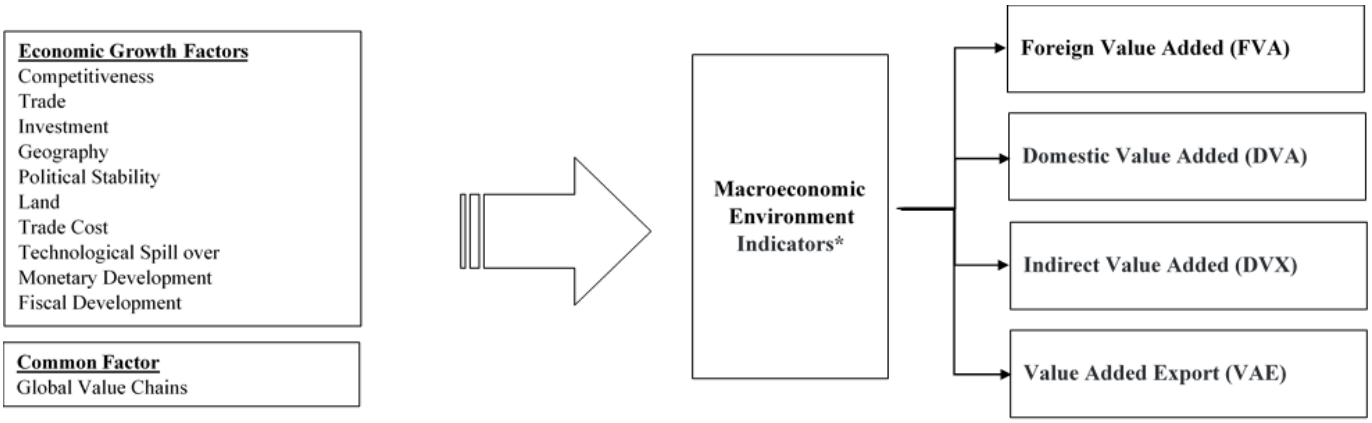


Figure 8: Conceptual Framework of the Study

Source: Compiled by the author

**Note: This article discusses macroeconomic environmental indicators related to international trade.*

Table 01: Variable meaning and Data Sources

Indicators	Indicator Meanings	Specific Indicators	Unit	Data Sources	Expected Sign
Economic Growth Factors					
CO	Competitiveness	Global Competitiveness Index	Rank	Global Competitiveness Report (GCR)	"+"
T.D.	Trade	GDP per capita	U.S. $	The World Bank Data	"+"
I.M.	Investment	Foreign Direct Investment, net (BOP, current US$)	U.S. $	The World Bank Data	"+"
P.S.	Political Stability	Global Political Environment	Yes - 1 / No - 0	Various sources	"+"
L.A.	Land Area	Land Area	Square Kilometres	The World Bank Data	"+"
T.C.	Trade Cost	Distance between Capitals	Km	CEPII	"-"
T.S.	Technological Spillover	Research and development expenditure (% of GDP)	Percentage	The World Bank Data	"+"
MD	Monetary Development	Real Interest Rate (%)	Percentage	The World Bank Data	"-"
F.D.	Fiscal Development	Taxes on international trade (% of revenue)	Percentage	The World Bank Data	"+"
Common Factors					
GVC	Global Value Chains	Global Value Chains	U.S. $	Using the Eora Database	"+"
Dependent Variables					
DV 01	Foreign Value Added (FVA)		U.S. $	Using the Eora Database	
DV 02	Domestic Value Added (DVA)		U.S. $		
DV 03	Indirect Value Added (DVX)		U.S. $		
DV 04	Value Added Export (VAE)		U.S. $		

Source: Compiled by the author

Model

This model is used to analyze GVC with the leading 25 trade exporters of Sri Lanka. As said above, in this analysis, all variables are expressed basic level. According to that data, the following equations are constructed. ε is the random interference term.

$$Equation\ \ 1: lnDV_1 = \alpha + \beta_1\, lnCO + \beta_2\, lnTD + \beta_3\, lnIM + \beta_4\, lnPS + \beta_5\, lnLA + \beta_6\, lnTC + \beta_7\, lnTS + \beta_8\, lnMD + \beta_9\, lnFD + \beta_{10}\, lnGVC + \varepsilon$$

$$Equation\ \ 2: lnDV_2 = \alpha + \beta_1\, lnCO + \beta_2\, lnTD + \beta_3\, lnIM + \beta_4\, lnPS + \beta_5\, lnLA + \beta_6\, lnTC + \beta_7\, lnTS + \beta_8\, lnMD + \beta_9\, lnFD + \beta_{10}\, lnGVC + \varepsilon$$

$$Equation\ \ 3: lnDV_3 = \alpha + \beta_1\, lnCO + \beta_2\, lnTD + \beta_3\, lnIM + \beta_4\, lnPS + \beta_5\, lnLA + \beta_6\, lnTC + \beta_7\, lnTS + \beta_8\, lnMD + \beta_9\, lnFD + \beta_{10}\, lnGVC + \varepsilon$$

$$Equation\ \ 4: lnDV_4 = \alpha + \beta_1\, lnCO + \beta_2\, lnTD + \beta_3\, lnIM + \beta_4\, lnPS + \beta_5\, lnLA + \beta_6\, lnTC + \beta_7\, lnTS + \beta_8\, lnMD + \beta_9\, lnFD + \beta_{10}\, lnGVC + \varepsilon$$

The study reveals the economics model that emerges as an alternative to achieving detailed research objectives. The economic model absorbs the basic features of an economic phenomenon that eradicates the real world. Modelling is based on current information relevant to the study. An economic model's specifications depend on the study's information, which has been established in standard theories and other major empirical works.

Panel data models are often measured using fixed Effect (FE) or random Effect (RE) techniques. Persistent influence explores the relationship between predictive and predictive variables within an organization. Every organization has its characteristics that may or may not affect forecast variables FE. The rationale behind it is to assume a correlation between the organization's error term and the forecast variables FE. Eliminate the effects of those time-changing elements to assess the predictors' net impact on the return variable. Another crucial assumption of the Fixed Effect (FE) is that those time-varying features are unique to the country and should not be associated with other countries' features. Another crucial assumption of the Fixed Effect (FE) is that those time-varying features are unique to the country and should not be associated with other countries' features. Every country should be separate. Therefore, associating with others should not be the wrong word and constant in the country. If the error terms are correlated, the static Effect is not appropriate because the assumptions are incorrect. That relationship needs to be demonstrated (often using random effects); This is the Hausman Test's main argument (Torres-Reyna, 2007).

Random effects assume that the organization (country) error term is not correlated with the predictors, allowing time-variables to play a role as independent variables. It is necessary to specify those features that may or may not affect random effects' predictive variables (Greene, 2008). The problem here is that some variables do not exist, avoiding the variable tendency of the model. RE allows generalizing the assumptions beyond the sample used in the model. According to Greene (2008), the Hausman test can be activated by the model. The sponsored model uses random effects instead of static effects to determine the association of static

or random effects. It checks for unique errors associated with the receiver if the zero assumption is that they are not.

Conclusion

Descriptive Statistics

This section provides detailed statistics on the dependent and independent variables used in this thesis for the top 26 exporting countries to Sri Lanka. The dependent variables used in the study were Foreign Value Added (FVA), Domestic Value Added (DVA), Indirect Value Added (DVX), and Value Added Export (VAE). In contrast, the independent variables were competitiveness (CO), trade (TD), investment (IM), political stability (PS), land area (LA), trade cost (TC), technological sluice gates (TS), and monetary development (MD), Fiscal Development (FD) and Lag variables for dependent variables. The common variable is the global value chain (GVC). Thus, there were a total of 754 observations of each dependent and interpretable variable (panel data from 29 countries for 29 years).

Table 02 presents the mean, standard deviation, minimum and maximum values for the dependent and independent variables. According to Table 02, all variables contained 754 observations, but the late variable included 728 observations. Here, the dependent variables in this article are Foreign Value Added (FVA), Domestic Value Added (DVA), Indirect Value Added (DVX), and Value Added Export (VAE) over the past 29 years.

For the overall sample, the mean foreign exchange value added (FVA) average was 17.14, with a minimum of 10.20 in the Maldives in 1990 and a maximum of 20.59 in Germany in 2014. Standard deviation figures for Foreign Value Added (FVA) Figure 2.142 show the foreign exchange added (FVA) variation between the top 26 exporting countries. Also, the mean value of domestic value-added (DVA) was 18.28, with a minimum of 11.23 in 1990 in the Maldives and a maximum of 21.35 in 2018 in China. The standard deviation for Domestic Value Added (DVA) figures was 1.872, indicating the Domestic Value Added (DVA) variation among the top 26 exporting countries.

Table 02: Descriptive Statistics

VARIABLES	(1) N	(2) MEAN	(3) SD	(4) MIN	(5) MAX
DV01	754	17.14	2.142	10.20	20.59
DV02	754	18.28	1.872	11.13	21.35
DV03	754	17.23	2.038	9.259	20.34
DV04	754	18.62	1.905	11.46	21.56
DV01 Lag	728	17.11	2.140	10.20	20.59
DV02 Lag	728	18.25	1.870	11.13	21.33
DV03 Lag	728	17.20	2.038	9.259	20.31
DV04 Lag	728	18.59	1.903	11.46	21.56
CO	754	2.953	0.975	0.693	4.890
TD	754	9.498	1.395	5.708	11.39
IM	754	22.61	2.004	15.54	26.75
PS	754	0.821	0.384	0	1

LA	754	12.51	2.869	5.704	16.61
TC	754	8.552	0.969	4.934	9.723
TS	754	0.711	0.527	0.00324	3.358
MD	754	1.235	0.742	0.00120	4.484
FD	754	1.068	1.602	0	9.599
GVC	754	17.96	2.033	10.54	21.11
Year 1- Year 29	754	0.0345	0.183	0	1

Source: Compiled by the author using data from the survey

The mean of Indirect Value Added (DVX) was 17.23, with a minimum of 9.259 Maldives in 1991 and a maximum of 20.34 China in 2018. The standard deviation statistics for Indirect Value Added (DVX) was 2.038, which indicates that the Indirect Value Added (DVX) variation between the top 26 export countries. Next, the mean of Value-Added Export (VAE) was 18.62 with a minimum of 11.46 in the Maldives in 1990 and a maximum of 21.56 in Germany in 2013. The standard deviation statistics for Value-Added Export (VAE) was 1.905, which indicates that the Value-Added Export (VAE) variation between the top 26 export countries. In addition to that, all data passed through the 1st difference stationary unit root test.

Panel Model

Table 3. (a) presents the estimation results for the pooled, fixed and random effects models for Foreign Value Added (FVA) and Domestic Value Added (DVA). First, Foreign Value Added (FVA), according to table 3. (a), interprets the effects of the Hausman test and means that country-specific influences are correlated with regressors which is explicit that the null hypothesis is rejected.

Table 3. (a): Estimation Results I

VARIABLES	Pooling DV01	Fixed DV01	Random DV01	Pooling DV02	Fixed DV02	Random DV02
DV01 Lag	0.967***	0.596***	0.908***			
	(0.00878)	(0.0198)	(0.0124)			
CO	-0.00277	-0.0100	-0.00493	-0.00399	0.000477	-0.00395
	(0.00366)	(0.00611)	(0.00473)	(0.00376)	(0.00675)	(0.00386)
TD	0.0189***	-0.0953***	-0.0236***	-0.00711*	0.00815*	-0.00668*
	(0.00348)	(0.0107)	(0.00494)	(0.00364)	(0.0116)	(0.00377)
IM	0.00449*	0.00258	0.00181	0.00910***	0.00110	0.00896***
	(0.00229)	(0.00213)	(0.00239)	(0.00239)	(0.00237)	(0.00241)
PS	-0.0167*	-0.0161**	-0.0143	-0.0115	0.0117	-0.0108
	(0.00872)	(0.00759)	(0.00880)	(0.00894)	(0.00841)	(0.00898)
LA	-0.00502***	-0.360	-0.0129***	0.0121***	0.678*	0.0128***
	(0.00166)	(0.336)	(0.00248)	(0.00222)	(0.381)	(0.00229)
TC	0.00923*	-	0.0236***	-0.0125**	-	-0.0130**
	(0.00505)		(0.00745)	(0.00521)		(0.00539)
TS	-0.00532	-0.0152**	-0.00303	0.00282	0.0203***	0.00328
	(0.00535)	(0.00608)	(0.00619)	(0.00557)	(0.00673)	(0.00568)
MD	0.00539	0.00160	0.00593	0.00297	0.00998***	0.00304
	(0.00364)	(0.00334)	(0.00378)	(0.00368)	(0.00366)	(0.00371)
FD	0.000866	-0.00108	0.00103	0.00119	0.00391*	0.00122
	(0.00169)	(0.00184)	(0.00193)	(0.00174)	(0.00204)	(0.00177)
GVC	0.0390***	0.463***	0.101***	0.0728***	0.410***	0.0770***
	(0.00983)	(0.0263)	(0.0137)	(0.00996)	(0.0247)	(0.0103)
DV02 Lag				0.912***	0.602***	0.907***
				(0.0117)	(0.0213)	(0.0120)
DV03 Lag						

DV04 Lag						
Constant	2.089	4.630	-20.85	1.644	3.039	-18.03
	(1.474)	(4.562)	(36.86)	(1.512)	(5.108)	(39.54)
Observations	728	728	728	728	728	728
R-squared	0.9678	0.9458	0.9341	0.9544	0.9289	0.9054
Number of Country		26	26		26	26
P value of F/Wald Stat	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hausman Test		YES	NO		YES	NO
Country FE		YES	NO		YES	NO
Year FE		YES	NO		YES	NO

Notes: ***, **, * are statistical significance at the 1%, 5% and 10% levels, respectively and *t* – statistics are in parentheses.

Source: Compiled by the author using data from the survey

That means that the fixed effects model is preferred, and the analysis of coefficients in this paper focus on the fixed effects because it is the most efficient model. The model's overall performance seems to be good, with high R^2 values of 94.58 per cent in the case of the fixed-effects model. Out of eleven variables, Foreign Value Added (FVA) lag, Political Stability, and Technological spillover are highly significant with negative signs, and only the Global Value Chain and Trade have significant positive signs. Other variables have insignificant and mixed signs. That indicates that the model is suitable for explaining the Sri Lankan Foreign Value Added (FVA) flows to its major 25 exporting partners. As shown in table 3. (a), R^2 means that approximately 94.58 per cent of the foreign value-added variable in Sri Lanka and 25 exporting the fixed effects model can explain trading partners. The F-test value shows that the model's overall significance is highly significant at a 5 per cent level.

Second, Domestic Value Added (DVA), according to table 3. (a), the model's overall performance seems to be stable, with high R2 values of 92.89 per cent in the case of the fixed-effects model. Out of eleven variables, Domestic Value Added (DVA) lag, Trade, Land, Technological spillover, Monetary Development, Fiscal Development and the global value chain are highly significant with positive signs. Other variables have insignificant and expected signs. That indicates that the model is suitable for explaining the Sri Lankan Domestic Value Added (DVA) flows to its major 25 exporting partners. As shown in table 3. (a), R^2 means that approximately 92.89 per cent of the Domestic Value Added (DVA) variable in Sri Lanka and 25 the fixed effects model can explain trading partners. The F-test value shows that the model's overall significance is highly significant at a 5 per cent level.

Table 3. (b) presents the estimation results for the pooled, fixed and random effects models for Indirect Value Added (DVX) and Value-Added Export (VAE). First, Indirect Value Added (DVX), according to table 3. (b), the model's overall performance seems to be stable, with high R^2 values of 97.06 per cent in the case of the fixed-effects model. Out of eleven variables, Indirect Value Added (DVX) lag, Trade, Political Stability, Technological spillover and the global value chain are highly significant with positive signs. Other variables have insignificant and expected signs. That indicates that the model is suitable for explaining the Sri Lankan Indirect Value Added (DVX) flows to its major 25 exporting partners. As shown in table 3. (a), R^2 means that

approximately 97.06 per cent of the Indirect Value Added (DVX) variable in Sri Lanka and 25 the fixed effects model can explain trading partners. The F-test value shows that the model's overall significance is highly significant at a 5 per cent level.

Table 3. (b): Estimation Results II

VARIABLES	Pooling DV03	Fixed DV03	Random DV03	Pooling DV04	Fixed DV04	Random DV04
DV01 Lag						
CO	-0.000928	0.000251	-0.000217	-0.00618*	0.00468	-0.00633*
	(0.00345)	(0.00609)	(0.00372)	(0.00320)	(0.00519)	(0.00382)
TD	-0.00643*	0.0823***	-0.00487	-0.0120***	0.0193**	-0.00998***
	(0.00334)	(0.0110)	(0.00368)	(0.00303)	(0.00886)	(0.00386)
IM	0.00691***	0.00224	0.00662***	0.00862***	0.000206	0.00705***
	(0.00212)	(0.00213)	(0.00216)	(0.00201)	(0.00182)	(0.00204)
PS	0.00491	0.0260***	0.00645	-0.0166**	0.00465	-0.0111
	(0.00808)	(0.00762)	(0.00819)	(0.00759)	(0.00646)	(0.00755)
LA	0.00596***	0.304	0.00721***	0.00858***	0.815***	0.0129***
	(0.00165)	(0.342)	(0.00183)	(0.00153)	(0.292)	(0.00191)
TC	-0.0110**	-	-0.0128**	-0.00787*	-	-0.0109*
	(0.00478)		(0.00529)	(0.00434)		(0.00563)
TS	-0.00632	0.0149**	-0.00547	0.00535	0.0137***	0.00862*
	(0.00493)	(0.00608)	(0.00519)	(0.00475)	(0.00514)	(0.00521)
MD	0.00273	0.00306	0.00266	0.00282	0.00906***	0.00400
	(0.00332)	(0.00330)	(0.00339)	(0.00314)	(0.00281)	(0.00319)
FD	0.00279*	0.000681	0.00279*	0.000224	0.00427***	0.000797
	(0.00156)	(0.00185)	(0.00164)	(0.00148)	(0.00157)	(0.00162)
GVC	0.0488***	0.346***	0.0576***	0.140***	0.540***	0.209***
	(0.00838)	(0.0234)	(0.00928)	(0.0136)	(0.0228)	(0.0158)
DV02 Lag						
DV03 Lag	0.947***	0.568***	0.937***			
	(0.00860)	(0.0240)	(0.00951)			
DV04 Lag				0.847***	0.475***	0.773***
				(0.0149)	(0.0206)	(0.0172)
Constant	2.637*	-6.242	5.627	2.091	-0.709	-19.90
	(1.363)	(4.718)	(35.57)	(1.284)	(3.928)	(32.03)
Observations	728	728	728	728	728	728
R-squared	0.9792	0.9706	0.9605	0.9012	0.8927	0.8843
Number of Country		26	26		26	26
P value of F/Wald Stat	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hausman Test		YES	NO		YES	NO
Country FE		YES	NO		YES	NO
Year FE		YES	NO		YES	NO

Notes: ***, **, * are statistical significance at the 1%, 5% and 10% levels, respectively and *t* – statistics are in parentheses.
Source: Compiled by the author using data from the survey

Second, Value-Added Export (VAE), according to table 3. (b), the model's overall performance seems to be stable, with high R^2 values of 89.27 per cent in the case of the fixed-effects model. Out of eleven variables, Value-Added Export (VAE) lag, Land, Trade, Technological spillover, Monetary Development, Fiscal Development and the global value chain are highly significant with positive signs. Other variables have insignificant and expected signs. That indicates that the model is suitable for explaining the Sri Lankan Value-Added Export (VAE) flows to its major 25 exporting partners. As shown in Table 3. (b), R^2 means that approximately 89.27 per cent of the Indirect Value Added (DVX) variable in Sri Lanka and 25 the fixed

effects model can explain trading partners. The F-test value shows that the model's overall significance is highly significant at a 5 per cent level. In addition to that, the test for fixed Effect (Foreign Value Added (FVA), Domestic Value Added (DVA), Indirect Value Added (DVX), and Value-Added Export (VAE)) namely cross-sectional dependence, Heteroskedasticity and serial correlation have no relation at all. It means there no cross-sectional dependence, no heteroskedasticity and no serial correlation at all.

Table 4: Summary of Regressions Results

Variables	Expected Results	Actual Results			
		Foreign Value Added (FVA)	Domestic Value Added (DVA)	Indirect Value Added (DVX)	Value Added Export (VAE)
Competitiveness	**Positive**	**Negative**	Positive	Positive	Positive
Trade	Positive	Positive	Positive	Positive	Positive
Investment	Positive	Positive	Positive	Positive	Positive
Political Stability	**Positive**	**Negative**	Positive	Positive	Positive
Land Area	Positive	Positive	Positive	Positive	Positive
Trade Cost	**Negative**	**Positive**	**Positive**	**Positive**	**Positive**
Technological Spillover	**Positive**	**Negative**	Positive	Positive	Positive
Monetary Development	**Negative**	**Positive**	**Positive**	**Positive**	**Positive**
Fiscal Development	**Positive**	**Negative**	Positive	Positive	Positive
Global Value Chains	Positive	Positive	Positive	Positive	Positive
Lag of Foreign Value Added (FVA)		Positive			
Lag of Domestic Value Added (DVA)			Positive		
Lag of Indirect Value Added (DVX)				Positive	
Lag of Value-Added Export (VAE)					Positive

Source: Compiled by the author using data from the survey

According to table 4, Trade, Investment, Land Area and Global Value Chains have the equal sign for explaining the Foreign Value Added (FVA), Domestic Value Added (DVA), Indirect Value Added (DVX), and Value-Added Export (VAE) flows to its major 25 exporting partners. Also, different lag fit for their different dependent variables (e.g.:- Foreign Value Added (FVA) - lag of Foreign Value Added (FVA), Domestic Value Added (DVA)- lag of Domestic Value Added (DVA) Etc...).Nevertheless, this paper could not be considered the investment as a significant variable due to the fixed-effects model. Next, Competitiveness, Political Stability, Technological Spillover and Fiscal Development have the equal sign for explaining the Domestic Value Added (DVA), Indirect Value Added (DVX), and Value-Added Export (VAE) flows to its major 25 exporting partners. However, this paper could not be considered Competitiveness as a significant variable due to the fixed-effects model.

Next, there are controversial issues here. The results of some variables do not match the expected and the actual results of this paper. First, trade costs and financial development should be negative in the expected outcome results. Still, the actual outcome has been Foreign Value Added (FVA), Domestic Value Added (DVA), Indirect Value Added (DVX), and Value-Added Export (VAE) explanation, a positive sign for flows into Sri Lankan 25 major export partners. Besides, political stability and fiscal outcomes should be positive in

the expected outcomes. Still, the actual outcome is a negative sign to explain the inflow of foreign value added (FVA) to Sri Lankan 25 major export partners.

Therefore, the article focuses on the main objective and sub-objectives while concentrating on policy recommendations and future studies. The article's primary purpose was to analyze the impact of the global value chain (GVC) on the macroeconomics environments in Sri Lanka. As mentioned in the previous studies, Sri Lankan macroeconomic environments are affected by Competitiveness (CO), Trade (TD), Investment (IM), Political Stability (PS), Land Area (LA), Trade Cost (TC), Technological Spillover (TS), Monetary Development (MD), Fiscal Development (FD), Lag variables for dependent variables and Global Value Chain (GVC). The primary device of the study was the Panel model. The analytical procedure included panel data for the period 1990 to 2018. The paper chose a sample of 25 for the empirical analysis with Sri Lanka. The panel model implemented in three methods. Those are the pooled model (common intercept model), the fixed effects model, and the random-effects model. The model ran the Hausman test to perform to chose which was the right one. The empirical findings and the secondary data results on the impact of GVC in Sri Lanka for the sample propose the following conclusions.

First, as expected, the result showed a positive relationship between Global Value Chain (GVC) and Foreign Value Added (FVA), Domestic Value Added (DVA), Indirect Value Added (DVX), and Value-Added Export (VAE) with vital statistical significance, showing that an increase in GVC will result in increased FVA, DVA, DVX and VAX. That implies becoming GVC participation in Sri Lanka can be stabled in their macroeconomics environment. That must be a significant concern for Sri Lanka. Second, as expected, the result showed a positive relationship between the Land area and Domestic Value Added (DVA and Value-Added Export (VAE) with a strong significance coefficient. The paper shows that the country can maximize the land size by increasing mega-scale industrial goods exports. The land area of GVC is expected to have a positive relationship with macroeconomics environment performance while assuming no changes in other factors, and more mega-scale industries are transformed into export industrialization activities. Example: The following companies owned thousands of acres in its plant establishment, Boeing, Airbus, Apple and Microsoft, Etc. (Withanawasam & Wang, 2020). Third, as expected, the per capita GDP has a positive impact on Foreign Value Added (FVA), Domestic Value Added (DVA), Indirect Value Added (DVX), and Value-Added Export (VAE) with a significance coefficient. The paper indicates many things about those things. Therefore, the higher per capita GDP leads to a stable macroeconomics environment. The reason is that Sri Lanka is trading with large countries in massive volumes. Fourth, as expected, technological spillover (T.S.) has a positive impact on domestic value-adding (DVA), indirect value-adding (DVX) and value-added export (VAE) with a significant value coefficient. Therefore, higher research and development expenditure (% of GDP) directly leads to a stable macroeconomic environment. Research and development of new products and improvements to existing products and processes can be identified as research and development projects. The key here is to reduce costs and innovate and create entrepreneurship. It directly directs research and

development expenditure into a well-built macroeconomic environment. However, unexpectedly, the technological overflow (T.S.) adversely affects foreign value addition (FVA).

Contrary to expectations, the result showed a positive correlation between the real interest rate and domestic value-added (DVA) and value-added export (VAE) of vital statistical significance. These results show that the rise in real interest rates will create a stable macroeconomic environment in Sri Lanka. In general, there is a negative relationship between the real interest rate and the macroeconomic environment with vital statistical significance. That reason would be the puzzle.

On the other hand, as expected, international trade taxes (% of revenue) have a positive impact on domestic value-added (DVA) and value-added coverage (VAE) with a coefficient of importance. These policy results show that Sri Lanka has developed international trade and policy with its trading partners. Furthermore, the global value chain positively impacts GVC domestic value-adding (DVA) and value-added export (VAE). According to that, GVC and F.D. variables positively impact macroeconomic environments.

Then, Competitiveness, investment and trade cost variables have a positive effect on domestic value-added (DVA), indirect value-adding (DVX) and value-added export (VAE) but no significant coefficients in the article. In this paper, those variables are sub-objectives, and the problem was that they were not satisfactory. Competitiveness is the hallmark of being more stable or better than others of a comparative nature. The World Economic Forum's Global Competitiveness Report (GCR) defines a country's competitiveness as a "*set of institutions, policies and factors that determine the level of productivity of a country, which in turn sets the level of prosperity that the country can earn*" (Schwab, 2015). As well as the World Competitiveness Yearbook (WCY), competitiveness is the "*ability of a nation to create and maintain an environment that sustains more value creation for its enterprises and more prosperity for its people*" (Center, 2014). Therefore, Sri Lankan products do not meet global demand and supply, as they are not suitable for the competitive global market. Investment is known as foreign direct investment. Here the main issue, Sri Lankan has not attracted foreign investors. Luring foreign investors should guide policymakers to earn their plan. Trade costs are identified as the Distance between the two countries based on the bilateral Distance between the two largest cities in the two countries (Mayer & Zignago, 2015). Distance and macroeconomic environments are of no importance. Why? Sri Lankan products do not satisfy the global market because they are not for rival global businesses. Furthermore, Sri Lanka is not interested in foreign investors. Therefore, there is no reason for foreign investors to choose Sri Lanka. But the best place in Sri Lanka. The Port of Colombo, the Port of Trincomalee and the Port of Hambantota are located on the One Belt One Road (OBOR), making Sri Lanka a maritime hub.

Finally, Sri Lanka maintains a strong relationship with the global value chain among macroeconomic environments. Nevertheless, Sri Lankan policymakers need to address competition, investment, trade costs,

and technological spillover. The new world is highly diverse and rapidly evolving. Therefore, Sri Lankan policymakers must carry on these strategies.

Suggestions for Future Studies

This research was intended to analyze the relationship between macroeconomic environments and living and economic factors—possible suggestions for future studies. The macroeconomic variables affect the global value chain. That is; It is a foreign debt: Sri Lanka's economy is based on foreign debt. Therefore, in addition to the investment, foreign loans are also expected. The second is export goods and services, Digitalization and Logistics Etc. Digitalization and Logistics have a new step in the global value chain. Therefore, in the following articles, new variables are foreign debt, export goods and services, Digitalization and Logistics Etc. Although the panel model was successful, other advanced models, such as the GMM model (Gaussian mixture model) and the structural equation model (SEM), are being used in data analysis. However, there are two types of relationships between the GMM model and the Structural Equation Formatting (SEM) multifunction dependence methods. Therefore, appropriate adjustments are reasonable, objective and unbiased.

References

Amiti, Mary, and Jozef Konings. 2005. "Trade Liberalization, Intermediate Inputs,and Productivity: Evidence from Indonesia." *IMF Working Papers* WP/05/146.

Atapattu, Danny. 2010. *Introduction to Economics: Part II (Economics Textbook in Sinhala)*. *Tharanjee Printers, Colombo*. Vol. 1. https://doi.org/10.1017/CBO9781107415324.004.

Bamber, Penny, Karina Fernandez-Stark, Gary Gereffi, and Andrew Guinn. 2014. "Connecting Local Producers in Developing Countries to Regional and Global Value Chains." *OECD Trade Policy Papers*, no. No, 160, OECD: 1–51.

Bas, Maria, and Vanessa Strauss-Kahn. 2015. "Input-Trade Liberalization, Export Prices and Quality Upgrading." *Journal of International Economics* 95 (2): 250–62. https://doi.org/10.1016/j.jinteco.2014.12.005.

Bela, Balassa. 1965. "Trade Liberalisation and ' Revealed ' Comparative Advantage '." *The Manchestcr School of Economic and Social Studeies* 33 (2): 99–123.

Cann, Oliver. 2016. "What Is Competitiveness ?" World Economic Forum. 2016. https://doi.org/10.4324/9780429462351-1.

Center, IMD World Competitiveness. 2014. "A Brief Comparison of the World Competitiveness Yearbook and the Global Competitiveness Report." *IMD World Competitiveness Yearbook*.

Commission, United States International Trade. 2017. "The Economic Effects of Significant U.S. Import Restraints." *United States International Trade Commission* 4796.

Criscuolo, Chiara, and Jonathan Timmis. 2017. "The Relationship Between Global Value Chains and Productivity." *International Productivity Monitor* 32: 61–83.

David, Andrew, Mitchell Semanik, and Mihir Torsekar. 2018. "Framework for Analyzing the Competitiveness of Advanced Technology Manufacturing Firms Framework for Analyzing Manufacturing Firms." *Office of Industries Working Paper ID-057*, no. September.

Diakantoni, Antonia, Hubert Escaith, and Thomas Verbeet. 2017. "Accumulating Trade Costs and Competitiveness in Global Value Chains." *WTO Working Paper* 02 (January). https://doi.org/10.2139/ssrn.2906866.

Duhigg, By Charles, and David Barboza. 2012. "In China, Human Costs Are Built Into an IPad." *The Best Business Writing 2013*, 2012. https://doi.org/10.7312/star16075-029.

Escaith, Hubert. 2017. *Accumulated Trade Costs and Their Impact on Domestic and International Value Chains*. *Measuring and Analyzing the Impact of GVCs on Economic Development: World Bank Team*.

Escaith, Hubert, and Sébastien Miroudot. 2016. "Industry-Level Competitiveness and Inefficiency

Spillovers in Global Value Chains." *24th International Input-Output Conference*, no. July: 1–29.
Ferrantino, Michael J. 2012. "Using Supply Chain Analysis to Examine the Costs of Non-Tariff Measures (NTMs) and the Benefits of Trade Facilitation." *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.1988245.
Gereffi, Gary, and Karina Fernandez-Stark. 2016. "Global Value Analysis." *The Duke Center on Globalization, Governance & Competitiveness (Duke CGGC)*, no. July.
Ghodsi, Mahdi, and Robert Stehrer. 2016. "Non-Tariff Measures Trickling through Global Value Chains." *PRONTO*.
Giovanni Pino. 2018. "Why Does Apple Manufacture in China ? China Can Support Apple ' s High Demands Assembling Locally Would Affect Consumers Most China Is the Best Fit for Apple." Www.Sourci.Com.Au. 2018.
Greene, William H. 2008. *Econometric Analysis*. *Prentice Hall*. https://doi.org/10.4324/9780429024429-7.
Grimes, Seamus, and Yutao Sun. 2016. "China's Evolving Role in Apple's Global Value Chain." *Area Development and Policy* 1 (1): 94–112. https://doi.org/10.1080/23792949.2016.1149434.
Grossman, G., and E. Rossi-Hansberg. 2006. "The Rise of Offshoring: It's Not Wine for Cloth Anymore." *The New Economic Geography: Effects and Policy Implications*, 59–102.
Gujarati, Damodar N. 2003. *BASIC ECONOMETRICS*.
Harvard, Center for International Development at. 2018. "SRI LANKA GROWTH DIAGNOSTIC ANALYSIS." Vol. 2018.
Humphrey, John, and Hubert Schmitz. 2002. "How Does Insertion in Global Value Chains Affect Upgrading in Industrial Clusters?" *Regional Studies* 36 (9): 1017–27. https://doi.org/10.1080/0034340022000022198.
Jones_Lin, Demirkaya_Meryem, and Bethmann_Erika. 2019. "Global Value Chain Analysis : Concepts and Approaches." *Journal of International Commerce and Economics*, no. April: 1–29.
Ketels, Christian H.M., and Olga Memedovic. 2008. "From Clusters to Cluster-Based Economic Development." *International Journal of Technological Learning, Innovation and Development* 1 (3): 375–92. https://doi.org/10.1504/IJTLID.2008.019979.
Koopman, By Robert, Zhi Wang, and Shang-jin Wei. 2014. "Tracing Value-Added and Double Counting in Gross Exports." *The American Economic Review* 104 (2): 459–94.
Mayer, Thierry, and S Zignago. 2015. "CEPII Distance Data." *Centre D'Etudes Prospectives et D'Informations Internationales (Online)*, no. May: 1–5. http://www.cepii.fr/CEPII/en/bdd_modele/bdd.asp.
Milberg, William, and Deborah Winkler. 2011. "Economic and Social Upgrading in Global Production Networks: Problems of Theory and Measurement." *International Labour Review* 150 (3–4): 341–65. https://doi.org/10.1111/j.1564-913X.2011.00120.x.
Mudambi, Ram. 2008. "Location, Control and Innovation in Knowledge-Intensive Industries." *Journal of Economic Geography* 8 (5): 699–725. https://doi.org/10.1093/jeg/lbn024.
OECD. 2007. "Glossary of Statistical Terms." *OECD Trade Policy Papers*. https://doi.org/10.1017/9781108164832.016.
———. 2011. "Global Value Chains: Preliminary Evidence and Policy Issues." *OECD - WPGI- Meeting*, no. May: 1–49.
Park, Albert, Gaurav Nayyar, and Patrick Low. 2013. *Supply Chain Perspectives and Issues*. *WTO Publications*. https://doi.org/10.30875/a81e684f-en.
Pelzman, Joseph. 2016. "Spillover Effects of China Going Global." *George Washington University, USA*. https://doi.org/10.1142/9171.
Pol Antràs, and Alonso de Gortari. 2017. "On The Geography of Global Value Chains." *NBER WORKING PAPER SERIES* Working Pa.
Porter, Michael E. 1990. "The Competitive Advantage of Nations." *New York : Free Press*. https://doi.org/10.4324/9781315193175-1.
Reinert, Erik S. 1995. "Competitiveness and Its Predecessors-a 500-Year Cross-National Perspective." *Structural Change and Economic Dynamics* 6 (1): 23–42. https://doi.org/10.1016/0954-349X(94)00002-Q.
Rouzet, Dorthée, and Sébastien Miroudot. 2013. "The Cumulative Impact of Trade Barriers Along the Value Chain: An Empirical Assessment Using the OECD Inter-Country Input-Output Model." *16th Annual*

Conference on Global Economic Analysis, no. June.
Schwab, Klaus. 2015. *The Global Competitiveness Report 2015-2016*. *World Economic Forum*. Vol. 5. https://doi.org/92-95044-35-5.
Sturgeon, Timothy, and Olga Memedovic. 2010. "Mapping Global Value Chains: Intermediate Goods Trade and Structural Change in the World Economy." *UNIDO Development Policy and Strategic Research Branch Working Papers*, 1–58.
Sun, Yutao, and Seamus Grimes. 2016. "China's Increasing Participation in ICT's Global Value Chain: A Firm Level Analysis." *Telecommunications Policy* 40 (2–3): 210–24. https://doi.org/10.1016/j.telpol.2015.06.003.
Teece, David J., Gary Pisano, and Amy Shuen. 1997. "Dynamic Capabilities and Strategic Management." *Strategic Management Journal* 18 (7): 509–33. https://doi.org/10.1142/9789812796929_0004.
The World Bank. 2020. "The World Bank In Sri Lanka." World Bank. 2020.
Timmer, Marcel, Bart Los, Robert Stehrer, and Gaaitzen De Vries. 2013. "Rethinking Competitiveness : The Global Value Chain Revolution." *VOX, CEPR Policy Portal*, 1–4.
Topalova, Petia, and Amit Khandelwal. 2011. "Trade Liberalization and Firm Productivity: The Case of India." *Review of Economics and Statistics* 93 (3): 995–1009. https://doi.org/10.1162/REST_a_00095.
Torres-Reyna, Oscar. 2007. "Panel Data Analysis Fixed and Random Effects Using Stata." In *Princeton University*.
Wang, Zhi, Shang-Jin Wei, and Kunfu Zhu. 2018. "Quantifying International Production Sharing At The Bilateral and Sector Levels." *Journal of Chemical Information and Modeling* 53 (9): 1689–99. https://doi.org/10.1017/CBO9781107415324.004.
Winkler, Daria Taglioni Deborah. 2016. "Making Global Value Chains Work for Development." *World Bank Group*, 1–289.
Withanawasam, Maduranga Pushpika Kumara, and Shaoyuan Wang. 2020. "Bilateral Trade in Sri Lanka Under Generalized System of Preference (GSP)." *North American Academic Research (NAAR)* 3 (May): 211–33.

Co - Authors

Maduranga Pushpika Kumara Withanawasam is currently a PhD student in International Trade and Economics at Dongbei University of Finance and Economics. He graduated with a degree in his BSc Business Administration (Business Economics) (Special) from the University of Sri Jayewardenepura, Sri Lanka, in 2010. He obtained MEcon (International Economics) in 2018 through the University of Colombo, Sri Lanka. He also holds an M.M. (Major in Management Science and Engineering) in the same year from Huazhong University of Science and Technology (HUST) in China. His research focuses on the global value chain, the gravity model, the Generalized System of Preference (GSP) and financial economics. He also serves as a lecturer at the University of Sri Jayewardenepura in Sri Lanka.
Email: madurangaw@sjp.ac.lk

王绍媛，东北财经大学国际经济贸易学院教授，主要从事中国对外贸易、国际经济关系的研究与教学。Wang Shaoyuan, Professor, School of International Economics and Trade, Dongbei University of Finance and Economics. She is mainly engaged in the research and teaching of Chinas foreign trade and international economic relations.