



“The Impacts of TPP and AEC on the Vietnamese Economy: Macroeconomic Aspects and the Case of Livestock Sector” is a comprehensive study on the economic effects of Viet Nam’s current integration process, with special focus on such important free trade agreements as Trans-Pacific Partnership (TPP) and ASEAN Economic Community (AEC). The book provides an assessment of macroeconomic impacts based on a standard computable general equilibrium analysis, employing the latest GTAP database. The authors then analyzes the impacts at sectoral level, from various dimensions as trade flows, prices,

outputs and changes in economic welfare. The livestock sector, which is considered having few advantages and being vulnerable under the implementation of TPP, is treated as a special case for in-depth study.

The book, consisting of 5 chapters and an appendix, provides an overview of Vietnam’s rapid international integration process in recent years, of which the negotiations and implementation of TPP and AEC play a central role. The authors focus on stimulating and analyzing the impacts of TPP and AEC on different aspects such as GDP, investment, trade, industrial outputs and labor demand; evaluating these changes in comparison with other economies, which are both member and non-member of these trade agreements. Before drawing general conclusions and policy implications, the authors spend two chapters analyzing the livestock sector from the market structure perspectives and assessing the impacts of the free trade agreements on Viet Nam’s livestock sector by the partial equilibrium approach.

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THE IMPACTS OF TPP AND AEC ON THE VIETNAMESE ECONOMY

VIET NAM INSTITUTE FOR ECONOMIC AND POLICY RESEARCH

Nguyen Duc Thanh and Nguyen Thi Thu Hang
 (Editors)

THE IMPACTS OF TPP AND AEC ON THE VIETNAMESE ECONOMY

Macroeconomic Aspects and the Case of Livestock Sector



THẾ GIỚI PUBLISHERS

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40 copies, trim size 18 x 26 cm at Duc Anh Investment and Technology Development
Company

5th floor, Saigon Bank Building, 16 Nguy Nhu Kon Tum street, Thanh Xuan District,
Ha Noi

Publishing License No.: 3790-2015/CXBIPH/01-231/ThG

Publishing Decree No.: 699/QĐ-ThG dated December 9, 2015

Printing completed and copyright deposited in the fourth quarter of 2015.

ISBN: 978-604-77-2003-3

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Branch: 7, Nguyen Thi Minh Khai street, District 1, Ho Chi Minh City

Tel: 0084.8.38220102

Email: marketing@thegioipublishers.vn, Website: www.thegioipublishers.vn

Director and Editor in Chief: Dr. Tran Doan Lam

Editor: Pham Tran Long Jacket Designer: Vu Thuy Lien

Layout designer: Le Nhat

Cover image: *Ocean* by Nguyen Chi Long (2012, acrylic on canvas, 90x120 cm).
Collection of NDT.

Supported by



Japan International Cooperation Agency

ABOUT VEPR

VIET NAM INSTITUTE FOR ECONOMIC AND POLICY RESEARCH (VEPR) was established on July 7, 2008 as a research center under the University of Economics and Business of Viet Nam National University, Ha Noi (VNU). VEPR has legal status and headquarters is located in the University of Economics and Business (UEB), Xuan Thuy, Cau Giay, Ha Noi.

VEPR considers its primary mission as carrying out economic and policy research to assist in improving the decision-making quality of policy-making institutions, enterprises, and interest groups by providing insights into the social, political, and economic factors that drive the economic affairs of Viet Nam and the region. The main activities of VEPR include (i) providing quantitative and qualitative analysis of changing economic conditions in Viet Nam and assessments of their impacts on various interest groups throughout the country; (ii) organizing policy dialogues among policy-makers, entrepreneurs, and other stakeholders to improve solutions to emerging issues; and (iii) conducting advanced training courses in economics, finance and policy analysis regularly and upon request.

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ACKNOWLEDGEMENTS

The report “The Impacts of TPP and AEC on the Vietnamese Economy: Macroeconomic Aspects and the Case of Livestock Sector” is conducted by a team of experts and researchers from Viet Nam Institute for Economic and Policy Research (VEPR), University of Economics and Business, Viet Nam National University (Ha Noi, Viet Nam) and Nagoya City University (Nagoya, Japan). The project is funded by Japan International Cooperation Agency (JICA) and is accomplished with the support from many individuals and organizations.

One of the most important contributions that must be mentioned is from the advisors and commentators, who have participated in various discussions, workshops and seminars during different stages of the Report. Gratitude is due to Mr. Hoang Thanh Van, Mr. Tong Xuan Chinh, Prof. Dr. Nguyen Dang Vang, Dr. Doan Xuan Truc, Mr. Ho Xuan Hung, Mr. Tran Duy Khanh, Dr. Dang Kim Son, Mrs. Nguyen Tuyet Minh and representatives from various organizations (full list in Appendix 8) for their sharing, comments and constructive feedbacks on various contents of the Report.

We would like to thank Japan International Cooperation Agency (JICA) Viet Nam for their generous support and cooperation for this Report, especially Mr. Okiura Fumihiko, Mr. Murashima Eiichi and Ms. Hoang Thi Tuat.

Our gratitude goes to VEPR colleagues and staffs for their enthusiasm, dedication and persistence.

Despite our efforts, we understand that there may be limitations and even errors in the Report. We sincerely hope to receive comments and contributions from the readers.

Ha Noi, October 9th, 2015

On behalf of the Authors

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LIST OF ABBREVIATIONS

AANZFTA	ASEAN-Australia-New Zealand Free Trade Agreement
ACFTA	ASEAN China Free Trade Area
AEC	ASEAN Economic Community
AFTA	ASEAN Free Trade Area
AIFTA	ASEAN-India Free Trade Agreement
AJCEP	ASEAN-Japan Comprehensive Economic Partnership
AKFTA	ASEAN-Korea Free Trade Agreement
APEC	Asia-Pacific Economic Cooperation
ASEAN	Association of Southeast Asian Nations
ATPSM	Agricultural Trade Policy Simulation Model
BTA	The US-Viet Nam Bilateral Trade Agreement
CEPT	Common Effective Preferential Tariff
CGE	Computable General Equilibrium
EU	European Union
FAPRI	Food and Agricultural Policy Research Institute
FDI	Foreign Direct Investment
FTAAP	Free Trade Area of the Asia-Pacific
FTAs	Free Trade Agreements
GDP	Gross Domestic Product
GE	General Equilibrium
GEL	General Exclusion List
GSIM	Global Simulation Analysis of Industry-level Trade Policy
GSO	General Statistics Office
GTAP	Global Trade Analysis Project
HAGL	Hoang Anh Gia Lai
HF	Holstein Friesian
HS	Harmonized System
ITC	International Trade Centre
KRU	Kazakhstan, Russia and Ukraine
M&A	Mergers and Acquisitions
MARD	Ministry of Agriculture and Rural Development
MFN	Most Favored Nation
NTBs	Non-tariff Barriers
OIE	World Organization for Animal Health
PE	Partial Equilibrium
PRRS	Porcine Reproductive and Respiratory Syndrome
RCA	Revealed Comparative Advantage
RCEP	Regional Comprehensive Economic Partnership
RCA	Revealed Comparative Advantage
SCAP	Southern Center for Agricultural Policy and Strategy

SITC	Standard International Trade Classification
SMP	Skim Milk Powder
SOEs	State-owned Enterprises
TPP	Trans-Pacific Partnership
TPSEP	Trans-Pacific Strategic Economic Partnership
TRIST	Tariff Reform Impact Simulation Tool
UHT	Ultra-High-Temperature
UN	United Nations
UNCTAD	United Nations Conference on Trade and Development
US	United States
USD	United States dollar
VCFTA	Vietnam-Chile Free Trade Agreement
VHLSS	Viet Nam Household Living Standards Survey
VJEPA	Viet Nam-Japan Economic Partnership Agreement
VKFTA	Viet Nam Korea Free Trade Agreement
VND	Viet Nam dong
WITS	World Integrated Trade Solution
WMP	Whole Milk Powder
WTO	World Trade Organization

INTRODUCTION

Viet Nam's deeper integration into the global economy, especially via such a comprehensive free trade agreement as the Trans-Pacific Partnership (TPP) or the establishment of the ASEAN Economic Community (AEC), brings various opportunities and challenges. Accompanying these are the gains and losses for the participants of the integration process. At the same time, the welfare of those who are not direct participants is also affected due to this process via changes in various aspects such as economic growth, trade, prices, labor, etc. Previous studies on the impacts of TPP on signatory countries gave a promising economic prospect for Viet Nam, which is going to be the largest beneficiary compared to the other 11 TPP countries. Similar studies on the impacts of AEC show much smaller changes on Viet Nam's economy.

Viet Nam's international integration over the past couple of decades has helped the country gain much in terms of economic growth, investment, export and income. However, the higher degree of openness also means higher exposure to external risks and possible worsening of internal risks. Great expectations came with the accession into the WTO, for example. Increases in export and foreign investment were remarkable. Yet, great influx of capital coupled with the inexperienced monetary policy (under fixed exchange rate management and greater openness) contributed to the asset price bubbles and the returning of double digit inflation in 2008. The heavily dependence of Viet Nam on imports and foreign investment, the long lasting consequences of the world economic crisis and sustaining internal weaknesses during the post-WTO period give the warning signs for Viet Nam not to be complacent with the promising TPP and, to a lesser extent, AEC. In order to make the best of the opportunities and overcome the challenges from integration, Viet Nam needs to continue to make further fundamental changes in economic structure, institutions and governing policies.

In addition, the impacts of this regional integration are expected to vary across industries. Comparatively advantageous industries are expected to benefit the most while disadvantageous industries may suffer albeit with different degrees. Livestock is the second largest sector of Viet Nam's agriculture, following crop cultivation. However, it is considered as unsustainable, uncompetitive and vulnerable to FTAs. Viet Nam's livestock sector's difficult conditions are reflected in the followings: (i) The size of production is small, unreliable and based on households (instead of large commercial farms), using leftovers as feeds and lacking care of animal diseases; (ii) Heavy dependence on foreign breeds and feeds; (iii) Disease-stricken problem is common though still under control; (iv) Slaughter hygiene and food safety remain limited, causing food poisoning; and (v) Environmental pollution due to livestock industry, harming producers and neighboring households as well.

Regardless of the fact that the opportunities are mainly offered to a limited number of big commercial farms in Viet Nam thanks to the reduced cost of inputs (breeds and feeds), having the above characteristics, the livestock sector of Viet Nam would face fierce competition from foreign producers when the tariffs and NTBs are reduced and removed

thanks to FTAs. The most potential sufferers from TPP and AEC in Viet Nam are considered to be producers of dairies (due to the shortage of Vietnamese products and the large proportion of imported ones in domestic market), beef (due to the high quality and reasonable price of imported beef), poultry (due to increasing price of Vietnamese products together with rising concern on food safety in Viet Nam in time of bird flu and other diseases) and pork and again poultry (due to lower prices of imports, though the competition is less serious thanks to the acceptable price of Vietnamese products, the small percentage of imported products in domestic market and the consumption habit of Vietnamese people).

Recent literatures, despite having already covered either the impacts of TPP and/or AEC on member's economic performance in general or the consequences of trade liberalization on Viet Nam's livestock sector and the welfare of livestock farming households, lack certain in-depth analysis. For example, Linh, Burton and Vanzetti (2008) construct numerous trade liberalization scenarios including VN only, AFTA, AFTA+3, VN-US, VN-EU25 but no scenarios include TPP. Another study by Todsadee, Kameyama and Lutes (2012) already studied TPP's impacts on the livestock sector in particular, their findings lack in-depth analysis on the sub-sectors as well as the market structure in member countries. In other words, the literatures still leave room for a comprehensive analysis in terms of the impacts of TPP and AEC on Viet Nam's economy and specifically on Viet Nam's livestock sector and its sub-sectors, which combine both desk-based and field-based studies. In the context of active lobbying of both pro- and anti-TPP sides, in line with the secrecy of TPP contents to media and the public, there exists a need for a thorough study to improve public awareness and policy makers' understanding about the soon-coming TPP and AEC. As a result, we conduct this study in order to investigate the potential impacts of TPP and AEC on Viet Nam's economy and its livestock sector to improve the knowledge of decision-makers, stakeholders (including investors) and the public regarding this promising and comprehensive integration.

This study attempts to make a quantitative evaluation of the potential economic impacts of liberalizing trade in goods and services under TPP and AEC on Viet Nam. Based on the recently published Global Trade Analysis Project (GTAP) Data Base version 9 by Narayanan, Aguiar and McDougall (2015) and the GTAP model (Hertel, 1997; McDougall, 2003), we conduct a set of numerical experiments to simulate the economic effects arising from the establishing TPP and AEC on both the macroeconomy and the livestock sector. Also, with the ambition to measure the diverse results across livestock sub-sectors (which GE models tend not sufficient to cover details), we use a PE model at the same time. Based on the data from UN Comtrade, we also run similar simulation exercises using the Global Simulation Analysis of Industry-level Trade Policy (GSIM) for our PE analysis of the livestock sector. We assume that bilateral tariffs on trade in goods among member countries will be completely removed and the non-tariff barriers will be reduced for trade facilitation. These liberalizations of trade in goods and services would generate economic gains to the participating countries. It should be noted that TPP and AEC are expected to liberalize not only trade in goods and services but also investment and movement of labor, but our analysis is confined to the former due to the data limitation.

Our main findings are of two folds. On the macroeconomic side, the analysis shows the clear gains in GDP after TPP and AEC, with Viet Nam being the biggest gainer in terms of GDP percentage under TPP. Viet Nam will also see large gains in investment, consumption and imports in general and in output and exports of apparels, textile, leather and footwear, especially to TPP member countries. Total export decline slightly under fixed primary factor assumption due mainly to higher competition in both input and output markets. TPP, and to a much lesser extent, AEC, causes Viet Nam to lose some of its exports to its competitors such as the US (processed food) or China (electronic equipment), etc. At the same time, we observe the movement of production resources from declining industries (such as wood products, coal, chemical, rubber, motor vehicles, machineries and parts and electronic equipment) to expanding industries such as textile, apparels and leather products. On the livestock sector side, we observe the narrowing down of the whole sector after TPP and, to a smaller degree, AEC. Given the low productivity and competitiveness of the sector, poultry (and to a lesser extent swine meat) producers will suffer the most in terms of output and welfare though the current consumption habit of Vietnamese people most of whom prefer fresh/warm meat than frozen one may slow down the impacts. On the other hand, milk and beef producers have better chance of survival. The sector needs quick restructuring efforts to improve efficiency in facing foreign competitors.

The structure of the book is as followed. Chapter 1 provides a general overview of TPP and AEC, recent negotiations and trends in trade and investment between Viet Nam and member countries. Chapter 2 discusses in details the impacts of TPP and AEC on the Viet Nam's economy and its economic sectors in relation to the country's main trading partners. This chapter provides the literature review, the discussions on the methodology, the model, the database as well as the main assumptions used in the study and discussed in details the impacts of TPP and AEC on GDP, investment, trade, output, welfare and labor demand using simulation results from the GE model. Chapter 3 and 4 look at the livestock sector in more details. First, Chapter 3 describes the trends and recent performance of Viet Nam's livestock sector, focusing on production, consumption, market structure and value chains in the sub-sectors as the combined results of a thorough desk study and various field trips across Viet Nam. Then Chapter 4 provides the methodology, the database as well as the main assumptions for both the GTAP (GE) and the GSIM (PE) models. In this chapter, the analysis of the impacts of TPP and AEC on Vietnamese livestock sector and sub-sectors is provided using simulation results obtained from the both the GE and PE models. The last chapter summarizes the research findings and provides policy discussions.

CHAPTER 1

BACKGROUND OF VIET NAM'S INTERGRATION

OVERVIEW OF VIET NAM'S FTAS AND TRADE LIBERALIZATION

Over the last 30 years since Doi Moi, the policy of opening the country and integrating into the international economy has become a primary strategy of Viet Nam, in line with structural reforms, aiming at economic growth and sustainable development. Starting with the participation into ASEAN and its free trade agreement in 1995, Viet Nam has been actively engaging further in bilateral and regional free trade agreements (FTAs) with major economies, namely the US, China, Japan, EU, Chile, etc., as well as multilateral trade networks like WTO, ASEAN-India, ASEAN-ROK, ASEAN-Australia-New Zealand.

Specifically, in addition to the Trans-Pacific Partnership (TPP) and the ASEAN Economic Community (AEC), Viet Nam is preparing to sign a new generation FTA, i.e., the EU - Viet Nam Free Trade Agreement (EVFTA). EU is a union of 28 European countries and one of Viet Nam's largest trading partners. Currently, Viet Nam does not have FTAs with any of the EU countries. EVFTA is a new generation FTA, meaning it has large coverage with high commitments covering 15 main areas such as: trade in goods and services, rule of origin, intellectual property rights, government purchases, etc. EU and Viet Nam have reached an agreement in principle for an FTA on August 4, 2015 and are currently working on completing the technical discussions and finalizing the legal text of the agreement for signing in 2015.

Table 1.1. FTAs Viet Nam has signed up to date

FTA	Partner	Coverage (% tariff lines)	In effect	Completion
WTO		100	2007	2019
AFTA	Intra ASEAN	97	1999	2015/2018
ACFTA	ASEAN-China	90	2005	2015/2018
AKFTA	ASEAN-Korea	86	2007	2016/2018
AANZFTA	ASEAN-Australia-New Zealand	90	2009	2018/2020
AIFTA	ASEAN-India	78	2010	2020
AJCEP	ASEAN-Japan	87	2008	2025
VJEPA	Viet Nam-Japan	92	2009	2026
VCFTA	Viet Nam-Chile	89	2014	2030
VKFTA	Viet Nam-Korea	88	2016	2031
VCUFTA	Viet Nam-Custom Union (Russia Belarus Kazakhstan)	90	2016	2027

In economic terms, benefits brought by FTAs to signatories are usually reflected in trade and FDIs. Since 2007, total volume of trade of Viet Nam increased by 2.68 times, from 111.3 billion USD in 2007 to 298.2 billion USD in 2014 (Appendix 2). In details, imports rose by 2.36 times and exports gained almost threefold value, reaching 148.0 billion USD and 150.2 billion USD in 2014, respectively.

After the entry of Viet Nam to WTO in 2007, there was an influx of FDI flowing to Viet Nam. Compared to the previous period, the total FDI registered in Viet Nam surged, with an amount of over 70 billion USD in the year of 2008 solely (GSO, 2015). However, due to impacts of the global financial crisis, the effective FDI in the same year 2008 was only 9.6 billion USD. On average, the total effective FDI reached 10.7 billion USD per annual in the period of 2007- 2014.

TRANS-PACIFIC PARTNERSHIP (TPP)

Remarkably, in 2008 Viet Nam began joining the Trans-Pacific Partnership (TPP) talks - which is considered as the most comprehensive and widely influential FTA up to the time being. Despite being named a trade pact, TPP is not only (or even mainly) about trade in goods but it ambitiously targets at rewriting the global rules on trade by liberalizing trade in services and financial services, enhancing the flows of investment and labor; and most importantly creating the institutional conditions serving that aim: legal framework related to intellectual property right, state-owned enterprises (SOEs), competition, dispute settlement, etc.

Historical Root

In fact, the TPP originated from the Trans-Pacific Strategic Economic Partnership (TPSEP or also known as Pacific-4) signed by 4 countries Brunei, Chile, New Zealand and Singapore on 3 June 2005 and enforced in 2006. TPSEP did not attract much public attention until early 2008 when the US agreed to join negotiations with Pacific-4 concerning the liberalization in trade of financial services and investment. In late September 2008, the US officially announced the start of TPP talks, followed by the almost immediate participation of Australia, Peru and Viet Nam in November of the same year with a promise of opening the first round in March 2009. However, due to the complicated political situation in the US after the inauguration of Barack Obama in January 2009, the first round was delayed to 15-19 March 2010 in Melbourne, Australia. After 3 rounds with 9 members, there are currently 12 countries participating in TPP negotiations with Malaysia joining in October 2010, Canada and Mexico in June 2012 and Japan in July 2013. Up to August 2013, 19 official rounds of TPP talks have been conducted (Table 1.2), not to mention numerous mid-term and ministerial meetings, bilateral talks and visits among member countries. After the 19th round of formal meetings, negotiations stopped taking the form of official rounds, but other meetings, such as Chief Negotiators Meetings and Ministers Meetings, continue.

Table 1.2. 19 Official Rounds of TPP Negotiations

Round	Date	Venue	Member countries
1	15-19/3/2010	Melbourne, Australia	Pacific-4 (P-4), US, Australia, Peru, Viet Nam
2	14-18/6/2010	San Francisco, US	
3	5-8/10/2010	Brunei	P-9 (P-4, US, Australia, Peru, Viet Nam, Malaysia)
4	6-10/12/2010	Auckland, New Zealand	
5	14-18/2/2011	Santiago, Chile	
6	24/31/4/2011	Singapore	
7	15-24/6/2011	Ho Chi Minh City, Viet Nam	
8	6-15/9/2011	Chicago, US	
9	22-29/10/ 2011	Lima, Peru	
10	5-9/9/2011	Kuala Lumpur, Malaysia	
11	2-9/3/2012	Melbourne, Australia	
12	8-18/5/2012	Dallas, US	
13	2-10/7/2012	San Diego, US	P-11: (P-9, Canada, Mexico)
14	6-15/9/2012	Virginia, US	
15	3-12/12/2012	Auckland, New Zealand	
16	4-13/3/2013	Singapore	
17	15-24/5/2013	Lima, Peru	
18	14-24/7/2013	Kota Kinabalu, Malaysia	12 current members (P-11, Japan)
19	23-30/8/2013	Bandar Seri Begawan, Brunei	

The latest meeting of Trans - Pacific Partnership (TPP) Trade Ministers took place in Hawaii, The United States during July 28-31, 2015. The meeting was expected to conclude the TPP negotiations after President Barack Obama was given the Trade Promotion Authority, or the fast track negotiating authority, by the Congress on June 24, 2015. Despite being considered coming nearly to the final stage, the meeting ended without making a formal statement on the conclusion of negotiations due to disagreements in 3 main issues: Canadian dairy tariffs, the protection of cutting-edge drugs known as “biologics” and Japanese access to the North American automobile market.

On September 30, 2015, Ministers from the 12 nations started to negotiate with the aim of reaching the deal in Atlanta, the United States. The stressful meeting lasted 5 days and on October 5, 12 countries reached the final agreement on TPP. The statement on the concluding negotiation of TPP was given shortly afterwards with the main content:

“We, the trade ministers of Australia, Brunei Darussalam, Canada, Chile, Japan,

Malaysia, Mexico, New Zealand, Peru, Singapore, United States, and Viet Nam, are pleased to announce that we have successfully concluded the Trans-Pacific Partnership. After more than five years of intensive negotiations, we have come to an agreement that will support jobs, drive sustainable growth, foster inclusive development, and promote innovation across the Asia-Pacific region.”

Next, the negotiators will carry out technical works in preparation for the announcement of TPP's negotiation documents to the public, such as legal review, translation, word evaluation. However, there is no official information about when TPP is signed.

Main Issues: Potential Contents and Controversies

Currently, there are 12 countries along the Pacific coast joining TPP, creating the largest free trade area, accounting for nearly 40% of total GDP of the world economy and 25% of global trade. According to official announcement released by the Office of the US Trade Representative (2015), in which five features making TPP “a landmark, 21st-century trade agreement, setting a new standard for global trade and incorporating next-generation issues that will boost the competitiveness of TPP countries in the global economy.”

- + Comprehensive market access. TPP eliminates or reduces tariff and non-tariff barriers across substantially all trade in goods and services and covers the full spectrum of trade, including goods and services trade and investment, so as to create new opportunities and benefits for businesses, workers, and consumers.
- + Regional approach to commitments. TPP facilitates the development of production and supply chains, and seamless trade, enhancing efficiency and supporting our goal of creating and supporting jobs, raising living standards, enhancing conservation efforts, and facilitating cross-border integration, as well as opening domestic markets.
- + Addressing new trade challenges. TPP promotes innovation, productivity, and competitiveness by addressing new issues, including the development of the digital economy, and the role of state-owned enterprises in the global economy.
- + Inclusive trade. TPP includes new elements that seek to ensure that economies at all levels of development and businesses of all sizes can benefit from trade. It includes commitments to help small- and medium-sized businesses understand the Agreement, take advantage of its opportunities, and bring their unique challenges to the attention of the TPP governments. It also includes specific commitments on development and trade capacity building, to ensure that all Parties are able to meet the commitments in the Agreement and take full advantage of its benefits.
- + Platform for regional integration. TPP is intended as a platform for regional economic integration and designed to include additional economies across the Asia-Pacific region.

The TPP includes 30 chapters covering trade and trade-related issues, beginning with trade in goods and continuing through customs and trade facilitation; sanitary and

phytosanitary measures; technical barriers to trade; trade remedies; investment; services; electronic commerce; government procurement; intellectual property; labor; environment; 'horizontal' chapters meant to ensure that TPP fulfils its potential for development, competitiveness, and inclusiveness; dispute settlement, exceptions, and institutional provisions. The summary of TPP's 30 chapters is in Appendix 1. In addition to updating traditional approaches to issues covered by previous free trade agreements (FTAs), the TPP incorporates new and emerging trade issues and cross-cutting issues. These include issues related to the Internet and the digital economy, the participation of state-owned enterprises in international trade and investment, the ability of small businesses to take advantage of trade agreements, and other topics.

Issues for Viet Nam

Entering TPP, Viet Nam faces not only opportunities but also a variety of challenges in both trade of goods and demand for institutional reforms. According to Hoang Van Chau et al. (2014), there are two major challenges for Viet Nam: (i) the challenge in the process of reforming and restructuring institutional and legal factors and (ii) the challenge in management and competition capacity of Vietnamese businesses. In the survey carried out by the authors in 2012, only 32.8% of surveyed businesses responded that they had a primary understanding about TPP, the rest either heard but did not understand or had not heard of TPP at all. For individual topics under TPP negotiations, the followings are considered challenging for Viet Nam when joining TPP: rule of origin for textile and apparel; intellectual property rights; SOE reforms; legal system reforms; and requirements on labor standards.

For rule of origin, the US commercial representative proposed the “yarn-forward” rule for Vietnamese textile and apparel products. This rule will remove access of these products from Viet Nam when most inputs of these industries are imported from China. On intellectual property right, TPP requires Viet Nam to participate in selected international conventions. The facts on current intellectual property right protection show that Viet Nam has not been able to meet TPP requirements. In addition, one of the essential requirements for a country to participate in TPP is to remove all government protections and support for SOEs. This means, with TPP, the SOE sector will face with losses and closure or complete privatization. Another challenge is in labor and union aspects, Hoang Van Chau et al. (2014) pointed out five main issues in these aspects for Viet Nam when joining TPP: (i) the approach to these aspects in other TPP member countries are new and different from that of Viet Nam; (ii) such factors as institutions, the way of thinking or habits of Viet Nam also possess specific characteristics that are different from other countries; (iii) the capacity to meet TPP requirements on labor; (iv) the losers and gainers under new new labor commitments; and (v) the other pressures on export and import for Viet Nam.

ASEAN Economic Community (AEC)

The objective of the AEC is to promote economic development in an equitable manner, to establish economic zone with higher competitiveness, facilitating for the full integration of

ASEAN into the global economy. In other words, with interchangeable characteristics of the product rather than complement each other as in TPP, the main ambition of the ASEAN countries when forming AEC is not only limited to ASEAN, but also to attract foreign investment flow into an unified and free area of merchandise, capital and labor.

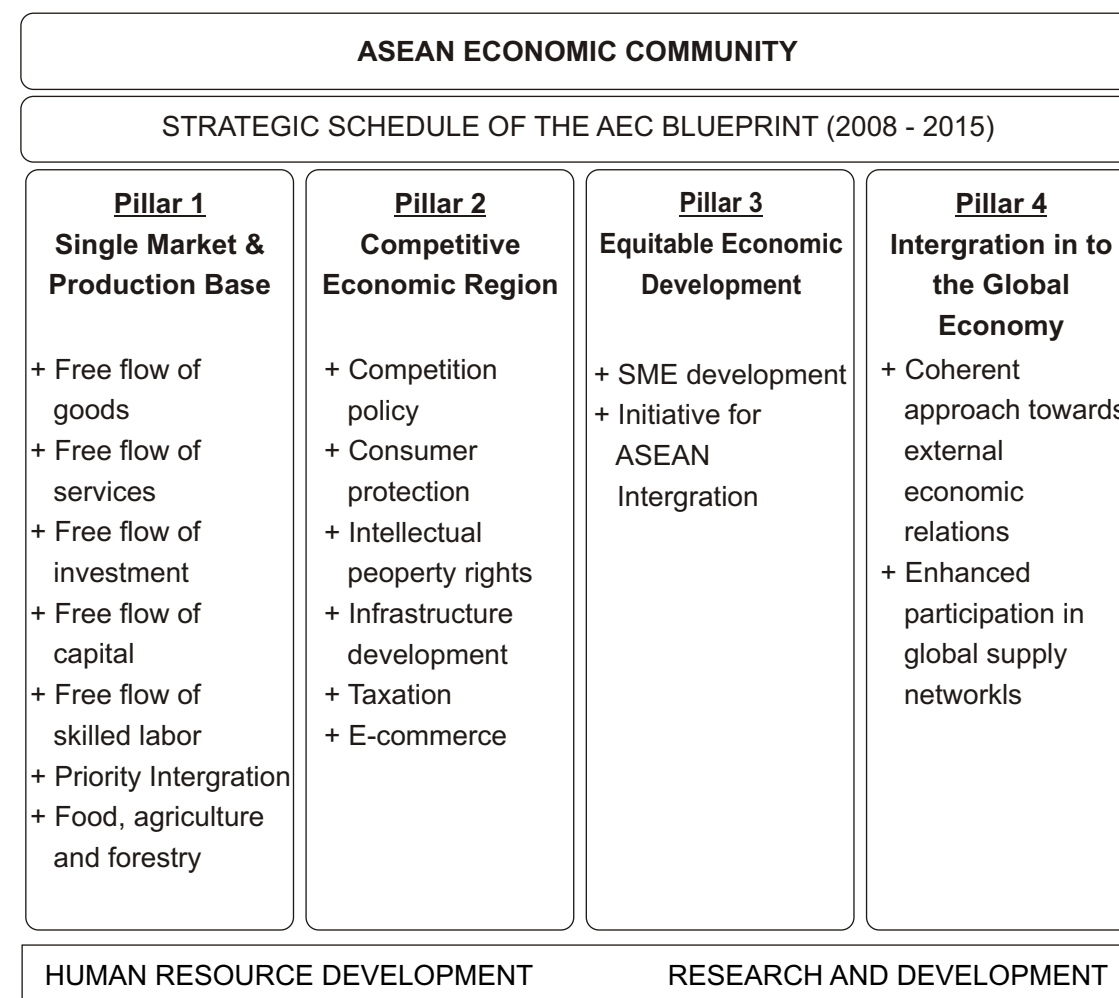
Historical Root

The Association of Southeast Asian Nations (ASEAN) was established in 1967, currently composed of 10 member countries: Indonesia, Malaysia, Philippines, Singapore, Thailand, Brunei, Myanmar, Cambodia, Laos and Viet Nam. With the goal of developing ASEAN into a zone of stability, prosperity, competitiveness and growth equity, reducing poverty and economic and social inequality, at the Bali conference in October 2003, the ASEAN leaders made a declaration on the establishment of the ASEAN Economic Community (AEC) in 2020 (Bali Concord II). After that, the objective of the completion was pushed to 2015, along with the wider and broader economic integration, adopted in Cebu Declaration, signed at the 12th ASEAN Summit in January 2007.

Four Pillars of AEC

At the 14th ASEAN Summit in Thailand, the ASEAN leaders signed the Cha-am/Hua Hin Declaration about the ASEAN Community Roadmap and also signed through AEC Blueprint, specifying measures to build four pillars of integration: (1) unified market and production base; (2) competitive economic region, (3) equitable economic development and (4) integration with the global economy; followed the schedule consists of 4 stages: 2008-2009, 2010-2011, 2012-2013 and 2014-2015. By using AEC Scorecard - mechanism for periodic assessment of implementation process of member countries, Pillai (2013) concluded that the level of implementation of the measures was estimated at 77.5% in total three first stages. Nguyen Hong Son, Nguyen Anh Thu, Nguyen Tien Dung and Ha Van Hoi (2014) suggested that with this level of implementation, ASEAN still have so many works to do to complete the AEC by 2015 according to the proposed schedule.

Figure 1.1. Four pillars of AEC



Source: ASEAN's presentation at the OECD Southeast Asia Regional Forum, 24-26 March 2014, Bali, Indonesia.

Even though the ASEAN integration is ambitiously comprehensive, in this study, we can only use Pillar 1 as input for the simulation. In detail, the free flow of goods and free flow of services are particularly considered to construct the scenarios.

Implementation up to date

Since joining ASEAN in 1995, Viet Nam has actively committed to CEPT/AFTA terms and conditions gradually removing tariffs and jointly signed multilateral FTAs between ASEAN and other countries (Japan, Australia New Zealand, Korea, etc.). AEC has various opportunities for Viet Nam including (1) regional stability support for Viet Nam's socio-economic development; (2) AEC helps promote Viet Nam's further integration into the global economy; and (3) AEC improves the bargaining power of Viet Nam with other major trade and investment partners.

Viet Nam has committed to gradually remove tariffs on 10,455 tariff lines to 0% for almost all products in 2015 and to 7% in 2018 for the rest of the products. In 2013, there were still 202 tariff lines in General Exclusion List (GEL). However, GEL until now is mainly on Tabaco and cigarettes, not on livestock.

ECONOMIC RELATIONS BETWEEN VIET NAM AND TPP/AEC COUNTRIES

In international economics, the economic relations between a country and another or a group of countries reflects mainly through the bilateral trade as well as the flows of foreign direct investment (FDI) among them. For Viet Nam, ASEAN neighbors and a number of TPP countries are already major partners of Viet Nam in terms of trade. Regarding FDI, Viet Nam has received a great amount of capital from the big countries in these two blocs.

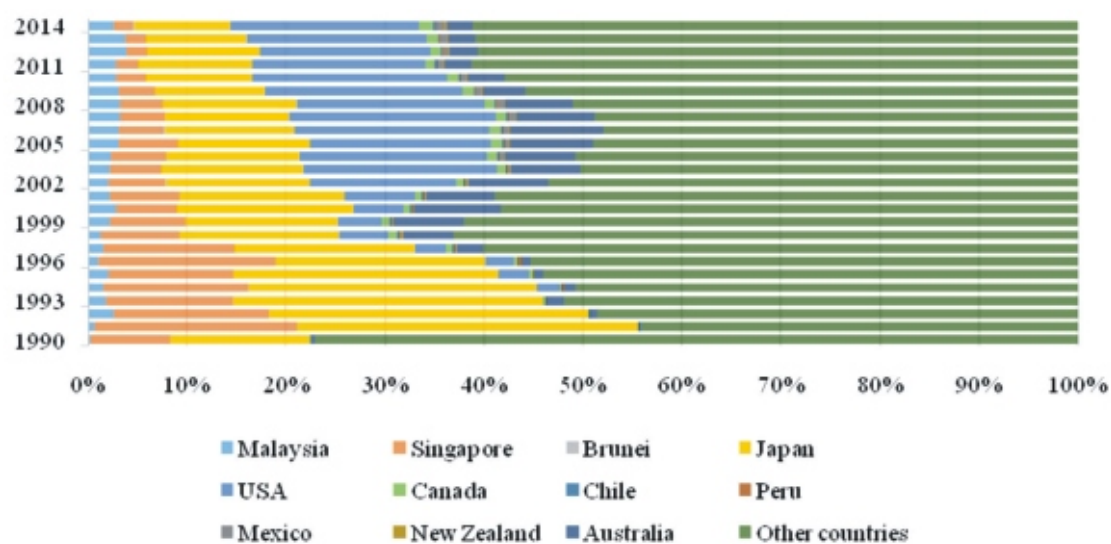
Trade Relations

Both TPP and AEC blocs consist of important trade partners of Viet Nam. In details, they account for 51% of total exports from Viet Nam and 38% total imports to Viet Nam in 2014.

Viet Nam's Trade with TPP Countries

Since 1990, although exports of Viet Nam to the TPP countries continuously increased, its share in total export was not stable. This share peaked at 50% of Viet Nam's exports in the early 1990s and in the 2003-2007 period.

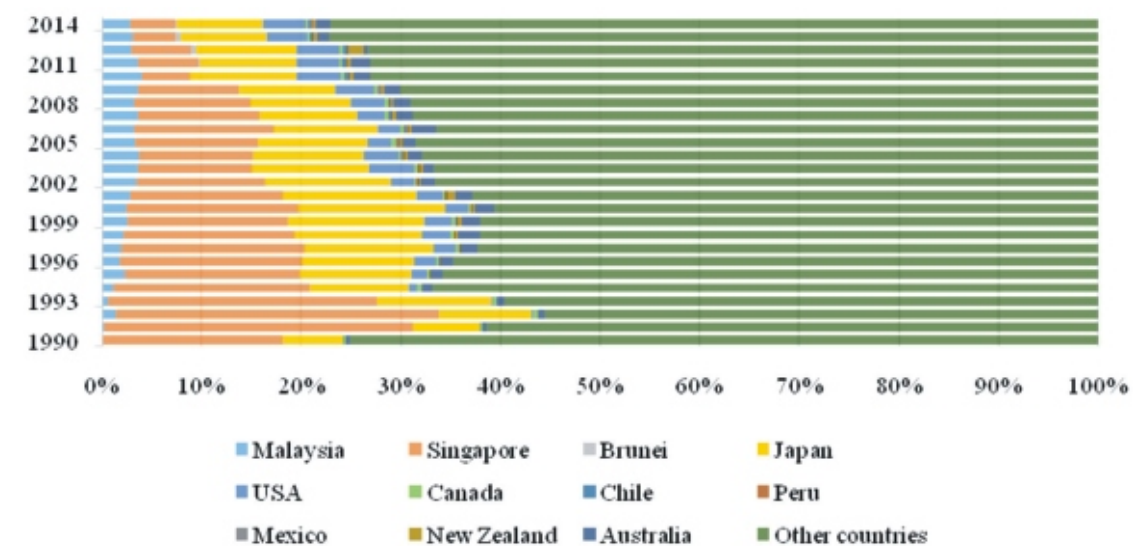
Figure 1.2. Viet Nam's Exports by Partner, 1990-2014



Source: Authors' calculation from CEIC Database and GSO (2015)

In the 1990s decade, Japan and Singapore were the two important trade partners of Viet Nam as exports to these markets were up to 50% of total Viet Nam's export. Since 2002, after The US-Viet Nam Bilateral Trade Agreement (BTA), exports to the US rose rapidly and the US quickly became the largest export market of Viet Nam. Also, during this period, exports to Australia also increased and accounted for approximately 10% of total exports of Viet Nam. After the world economic crisis, the proportion of Viet Nam's export to the TPP countries reduced and stabilized at 38-39%.

Figure 1.3. Viet Nam's Imports by Partner, 1990-2014



Source: Authors' calculation from CEIC Database and GSO (2015)

In TPP group, Viet Nam mainly imports from four major partners include Malaysia, Singapore, Japan and the US. The share of imports from TPP countries tended to decrease over the years, from 39.3% in 2000 to 30% in 2009, and was only at 23% in 2014. The main cause was due to the increasing imports from China, accounting for a large share of Viet Nam's import structure. In 2014, Viet Nam's imports from 11 TPP countries reached 34.0 billion USD while imports from China amounted to 43.9 billion USD and accounted for 29.6% of total imports.

Similar to trade with world, Viet Nam's trade with the TPP countries focuses on some main sectors such as electrical machinery and equipment, sound recorder (HS 85); mineral fuels, mineral oils and products of their distillation, (HS 27); apparel and clothing accessories (HS 61, 62), etc. (Appendix 2a, 2b).

In 2013, Viet Nam's exports to TPP countries still focus on labor-intensive goods such as clothing and apparel (HS 61, 62); footwear, gaiters and the like (HS 64); machinery products, electronic equipment (HS 85); furniture (HS 94); etc. According to the Classification by HS code 2-digit, ten major commodity groups exported by Viet Nam to TPP countries reached 39 billion USD, accounted for 75.52% of export turnover to these countries. In particular, Japan

and the US are the two main export markets and account for 3/4 of total exports from Viet Nam to TPP countries. With other markets, Viet Nam mainly exports a number of goods such as mineral fuels, mineral oils and products of their distillation (HS 27) to Malaysia (18.15%) and Australia (28.30%). Malaysia is also a major market for machinery products, electronic equipment (HS 85) from Viet Nam with 1.84 billion USD accounting for 23.28% of total export of this commodity. According to Nguyen Hong Son et al. (2014), these items are products which Viet Nam has comparative advantage with the Revealed Comparative Advantage (RCA) index greater than 1. Especially, when calculating the RCA index based on trade data classified by SITC, the authors showed that Viet Nam has advantages in labor-intensive goods such as furniture, handbags, footwear and apparel (HS 42, 61, 62, 64 and 94). Viet Nam also has some advantages in fish and crustaceans, mollusks (HS 03), with RCA of this commodity in 2012 is 7.77 (Nguyen Hong Son et al., 2014).

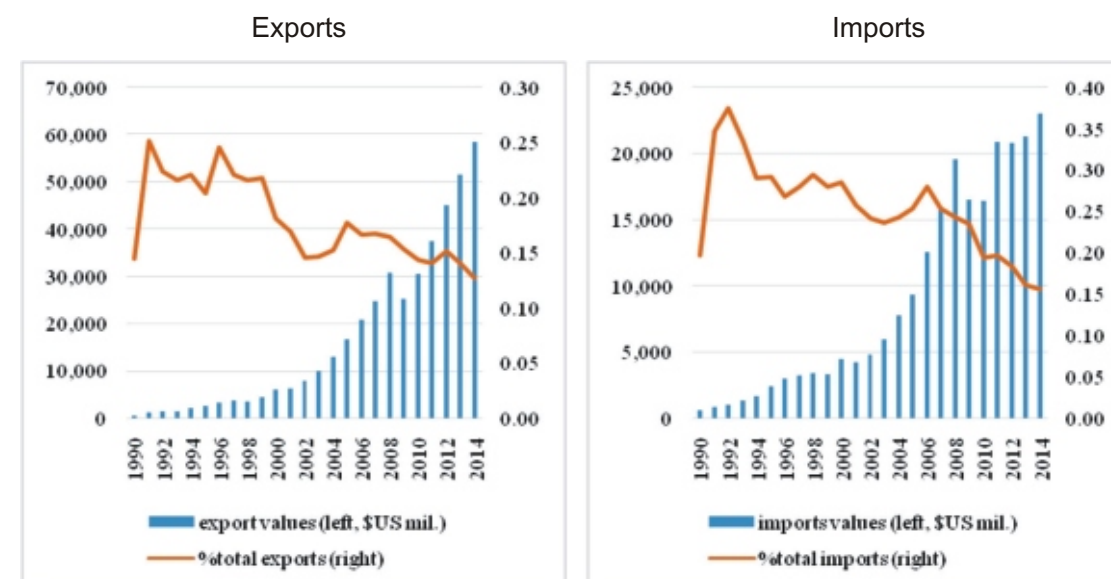
Not only export, Viet Nam also imports large amount of electrical machinery and equipment, sound recorders (HS 85) and mineral fuels, mineral oils and products of their distillation (HS 27). Import turnover of these two commodity groups reached 9.75 billion USD compared to 13.65 billion USD and accounted for 35.12% of Viet Nam's import turnover from TPP countries. These commodities mainly came from Singapore, Malaysia, Japan, Brunei and Canada. Viet Nam also imported some other items from TPP countries such as plastic and articles thereof (HS 39); Iron and steel and articles thereof (HS 72, 73); nuclear reactors, boilers, machinery and mechanical appliances, parts thereof (HS 84) from Japan; cotton (HS 52); residues and waste from the food industries, prepared animal fodder (HS 23) from Canada; and cereals (HS 10) from Australia.

Viet Nam's Trade with AEC countries

Data on exports and imports of Viet Nam with regional countries have shown the decrease in its share of total trade. In terms of values, Viet Nam's exports to AEC countries have continuously increased, however, the proportion of total exports declined over time. In 2014, Viet Nam's exports to the AEC reached 19.09 billion USD and accounted for 12.7% total export turnover.

Similarly, imports from the AEC countries declined from over 30% in 1990 to 15.5% in 2014, corresponding to 23 billion USD. In which, the major partners are still Thailand, Malaysia, Singapore and Indonesia. This shows that Viet Nam's trade flows are gradually shifting to new partners such as the US, South Korea, China and the EU instead of the traditional regional partners.

Figure 1.4. Viet Nam's Trade with AEC Countries



Source: Authors' calculation from CEIC Database and GSO (2015)

Unlike with the TPP markets, Viet Nam's trade with AEC countries does not focus on goods that have comparative advantage such as footwear, apparel and clothing, but iron and steel (HS72); plastics, rubber, glass and glassware (HS 39, 40, 70); wood and paper (HS 44, 48); electrical machinery and equipment, sound recorder (HS 85); mineral fuels, mineral oils and product of their distillation, (HS 27). Similar to trade with TPP countries, both exports and imports of the two main commodity groups (HS 85, 27) account for the largest share of trade between Viet Nam and the AEC countries, in which, Viet Nam mainly imports from Singapore and exports to Malaysia (HS 85, 17) and Cambodia (HS 27) (Appendices 2c and 2d).

According to statistical data, in 2013, exports of rubber, plastic to the ASEAN countries reached 5.7 billion USD, which mainly focused on Cambodia and Indonesia (HS 39) and Malaysia (HS 40). Cereals (HS 10) is also a major export item of Viet Nam to Malaysia, Philippine and Singapore. Nguyen Hong Son et al. (2014) indicated that the comparative advantages of Viet Nam were similar to the rest of ASEAN, including items such as wood, rubber, cereals, which have RCA larger than 1.

In terms of imports, excluding wood (HS 44) mainly imported from Laos; animal or vegetable fats and oils (HS 15) from Malaysia; paper and paperboard (HS 48) from Indonesia, the rest of the products are mostly imported from Thailand such as rubber, plastics and their products (accounting for approximately 50% of the import value of these two commodities); nuclear reactors, boilers, machinery and mechanical appliances; parts thereof (HS 84); vehicles (HS 87) and organic chemicals (HS 29).

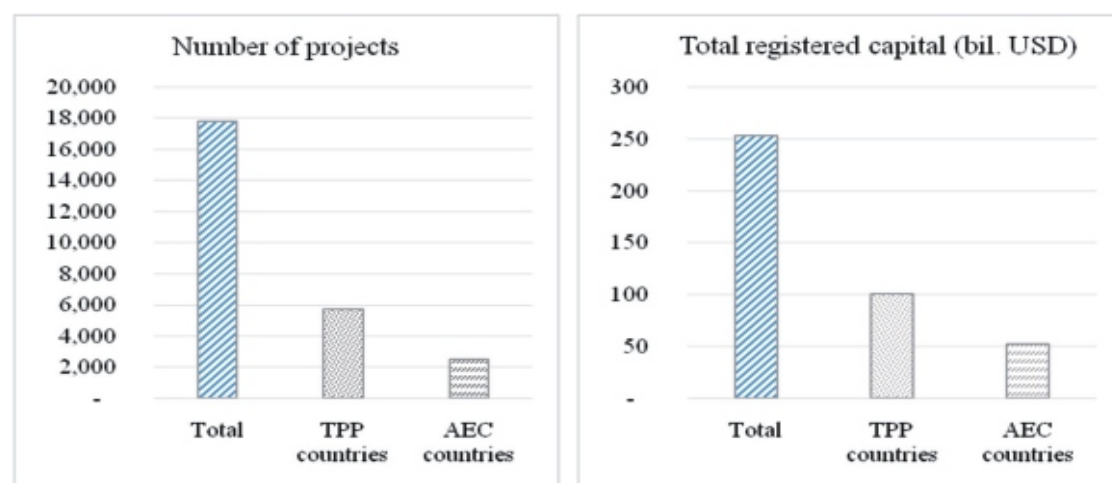
Foreign Direct Investment

Foreign Direct Investment in Viet Nam

Based on both of registered capital and the number of projects, TPP countries are always one of the largest investors to Viet Nam. With accumulation of the valid projects, the level of foreign direct investment from TPP countries tends to double both in value and the number of projects when compared with those from ASEAN countries. This is understandable when most of the participant countries of TPP are advanced countries such as Japan, Singapore, US, and also the largest trading partners of Viet Nam.

By the end of 2014, two out of four countries, which were the biggest foreign direct investors to Viet Nam, are TPP's members. At the same time, 8 of the 11 TPP countries have about 5.8 thousand valid investment projects in Viet Nam, accounting for 32.5% of total number of projects, in which, Japan and Singapore are the two biggest investors with 2,531 and 1,367 projects respectively.

Figure 1.5. Foreign Direct Investment in Viet Nam



Note: Accumulation of projects having effect as of 20th December, 2014

Source: GSO (2015)

In terms of register capital, the total accumulation capital of projects having effect as of 20th December, 2014 from TPP partners achieved 100.4 billion USD, accounting for 39.7% of register FDI to Viet Nam, in which, Japanese investors contributed about 37.3 billion USD, Singaporean investors 32.9 billion USD, the US and Malaysia have the same amount of about 10.9 billion USD.

Table 1.3. Viet Nam's FDI from AEC Countries

	Number of projects	Total registered capital (million USD)
TPP countries	5,766	100,424.0
In which:		
Japan	2,531	37,334.5
Singapore	1,367	32,936.9
United States	725	10,990.2
Malaysia	489	10,804.7
Canada	143	4,995.2
Australia	326	1,656.0
Brunei	160	1,624.4
New Zealand	25	82.1
Rest of the World	12,002	152,292.0
Total	17,768	252,716.0

*Note: Accumulation of projects having effect as of 20 December, 2014

Source: GSO (2015)

The majority of investment between ASEAN and Viet Nam comes from two TPP's participants (Singapore and Malaysia). Among the rest of AEC countries, Thailand has the biggest foreign direct investment capital to Viet Nam, with 379 valid projects and 6.75 billion USD accumulated capital at the end of 2014.

Table 1.4. Viet Nam's FDI from AEC Countries

	Number of projects	Total registered capital (million USD)
AEC countries	2,530	52,921.0
In which:		
Singapore	1,367	32,936.9
Malaysia	489	10,804.7
Thailand	379	6,749.2
Brunei	160	1,624.4
Indonesia	42	386.4
Philippines	72	298.1
Laos	8	66.8
Cambodia	13	54.6
Rest of World	15,238	199,794.9
Total	17,768	252,716.0

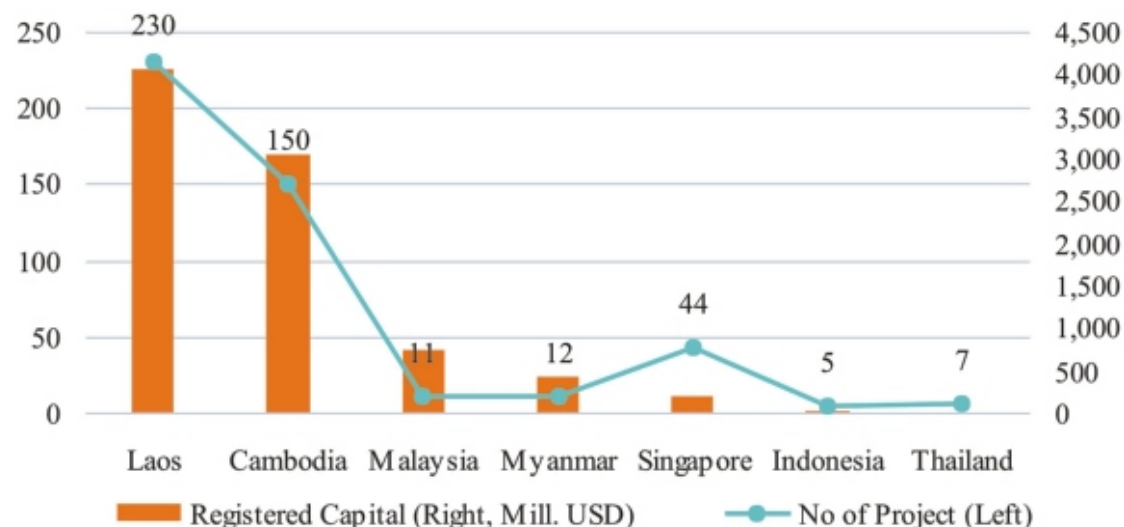
*Note: Accumulation of projects having effect as of 20 December, 2014

Source: GSO (2015)

Viet Nam's Outward Foreign Direct Investment

Along with exports to two neighbor countries, in recent years, Viet Nam has begun to invest to Laos and Cambodia. In 2013, Viet Nam exported 3.4 billion USD to the two countries, about 18.1% the total exports of Viet Nam to ASEAN. Meanwhile, Viet Nam has 380 projects licensed with the total capital of 7.1 billion USD in Laos and Cambodia (accumulation of projects having effect as of 31 December, 2013).

Figure 1.6. Viet Nam's Direct Investment Oversea projects licensed



Note: Accumulation of projects having effect as of 31 December, 2013

Source: GSO (2013)

Therefore, while some of countries in AEC are the markets which Viet Nam aims to conduct direct investment projects, TPP's countries are major investment partners of Viet Nam.

CHAPTER 2

IMPACTS OF TPP AND AEC ON VIET NAM'S ECONOMY

METHODOLOGY: COMPUTABLE GENERAL EQUILIBRIUM MODEL

This section, after providing a literature review on the models used for evaluating the impact of trade liberalization on various economies, discusses in details the model we use in this study. In particular, the model, the assumptions, the databases and the scenarios are described.

Literature Review

Studies on the impacts of trade liberalization are numerous ranging from huge models that cover a wide range of economies using extensive databases to those that go deeper into specific industries to analyze the (potential) impacts of a specific or a number of liberalization movement(s). In this study, with the aim to assess the macroeconomy and the livestock sector of Viet Nam, we review related quantitative researches that use either a general equilibrium approach or a partial equilibrium approach or both.

Since the beginning of the TPP negotiation, there has been a great deal of literature on ex-ante assessment of TPP's impacts on the member economies. Most cited studies are the ones using static computable general equilibrium (CGE) model of Todsadee et al. (2012), Petri, Plummer and Zhai (2011) and Kenichi (2014) or dynamic CGE by Itakura and Lee (2012) and Cheong (2013) to simulate the effects of trade liberalization of TPP and prospective FTA in Asia/Asia-Pacific region.

Petri et al. (2011) used CGE model and employed the GTAP 8 database, with a number of changes in parameters compared to the standard GTAP model. They constructed 9 scenarios depending on the coverage of integration into TPP and Asian FTA. Simulation results show that the US and China would be the center of TPP and Asian bloc, and participation of large economies such as Japan and Korea will increase the economic gains for the whole blocs. FTAAP originated from TPP will be more service-oriented liberalized and focus more on social issues compared to the FTAAP starting from Asia-FTA.

Itakura and Lee (2012) implemented simulations with the recursively dynamic GTAP which extends the standard GTAP model by incorporating the international capital mobility and accumulation of capital stock, based on GTAP database version 7.1. Besides the baseline scenario, the authors constructed 4 scenarios for simulation: TPP-track, Asia-track, and delayed-Asia-track and Global trade liberalization. Different from Petri et al. (2011), Itakura and Lee (2012) had a longer time period for implementation (2013-2030) and another direction of FTA expansion (the Asia-track starting from ASEAN instead of East Asia integration). Their results show that Asia-track will give larger welfare gains than the TPP-track, however due to the uncertainty about the creation of the pan-Asia FTA, TPP is now a more desirable option for Asia-Pacific countries.

Todsadee et al. (2012) used static GTAP model and GTAP 7 database with base year

2004 to simulate TPP's impacts on TPP economies and a number of livestock sub-sectors. At macro level, the result showed that not only TPP countries but some non-TPP ones also gain GDP growth thanks to this agreement, while some members like The United States and Chile see a decline in their GDP. This study also demonstrated that imports increased far more than exports after TPP takes effect.

Also applying the recursively dynamic GTAP model and GTAP 8 database, Cheong (2013) assessed the impacts of TPP in period 2013-2027 through three scenarios: TPP9, TPP12 and TPP12+PRC. Results reveal that the economic gains for member countries will increase if the coverage of integration expands, except for Peru, Malaysia and Viet Nam, though the difference is not really significant in term of percent change of GDP.

Kenichi (2014) also used GTAP 8 database for his static GTAP model to assess the impacts of TPP, RCEP and FTAAP on Asia-Pacific economies (APEC). The author constructed 6 scenarios: 2 for each of the FTAs mentioned above (one scenario of tariff removal and the other of tariff removal plus NTBs reduction). Results reveal that the income gain for APEC from TPP is 1.2% of regional GDP, from RCEP 1.0% and from FTAAP 4.3%. Moreover, the tariff removal together with NTB reduction will bring larger income gains than tariff removal only, implying that domestic reforms are necessary for signatory countries to take advantage from integration. Besides, when disaggregating the driving factors of income increase in all 6 scenarios, the dynamic effects of technology improvement and capital increase are the main ones, much greater than the static impacts of terms of trade and resource reallocation.

All studies reviewed above share a similar conclusion that almost all signatory countries would gain in terms of real GDP and economic welfare. Viet Nam will benefit the most with regard to the GDP increase in percentage. The main points are as follows.

First, the deeper integration will bring more economic gains: the increase in real GDP, welfare and income rise gradually when scenario changing from tariff removal only to tariff removal plus NTB reduction. For instance, the income gain for Viet Nam will double from 9.9% in tariff-removal scenario to 18% in tariff-removal + NTB-reduction scenario (Kenichi, 2014).

Second, the total welfare and total real GDP of the whole bloc will increase when the number of TPP members increase. However, the economic benefits are likely to be shared with the new-comers, such as Viet Nam. In case China enters TPP, almost all in-bloc economies will observe a significant economic gain, and vice versa for out-siders (Cheong, 2013).

Third, comparing the 2 free trade blocs (TPP and RCEP), Viet Nam will gain more if participating in TPP than in RCEP. In the ideal case, when TPP and RCEP can be united into FTAAP, the economic gain for Viet Nam will be higher than participating in either of them (Kenichi, 2014); (Itakura & Lee, 2012).

However, those studies employed GTAP 8 database with base year 2007 or older, together with quite ambitious scenarios of reducing 25%-50% NTBs for countries on signing TPP and/or did not discussed Viet Nam in details. This study aims to improve these weak points by using the GTAP 9 database with base year 2011 and more realistic scenarios with more reasonable extent of NTB reduction.

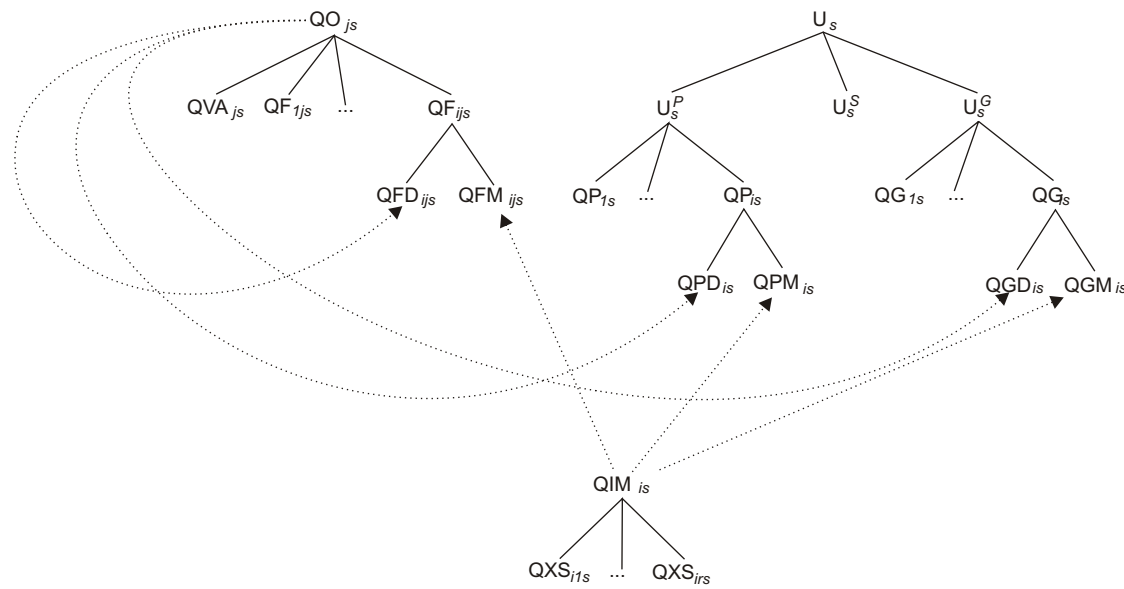
The Model

To analyze the impacts of TPP and AEC on the whole economy and its economic sectors, we use a standard GTAP model with database version 9. The results of the simulation exercises using GTAP 9 are used to discuss the impacts on the macroeconomy and the livestock sector (in Chapter 4).

Standard GTAP Model

Quantitative analysis of trade liberalization requires data on international trade matrix by country and by commodities, evaluated at different prices such as f.o.b., c.i.f., and tax-inclusive market prices. Trade data does not suffice for our analysis as we need to include the consideration of impacts on production, consumption, investment, and economic welfare for all participating countries as well as non-participating countries, in order to cover the entire global economy. Thus, we are conducting a globally economy-wide analysis to assess the economic effects of TPP and AEC implementation. For this purpose, we use the computable general equilibrium (CGE) model of global trade and the database developed by the Center for Global Trade Analysis, Purdue University, known as GTAP model and GTAP Data Base. The details of multi-region, multi-sector GTAP model (Hertel, 1997; McDougall, 2003) and the GTAP Data Base version 9 (Narayanan et al., 2015) covering 140 regions (countries) and 57 industrial sectors with 2011 benchmark year can be readily accessed at the GTAP website (www.gtap.org). The standard GTAP model is a comparative static general equilibrium model of global trade. It assumes perfect competition, constant returns to scale of production technology, and differentiation of trades based on the place of origin (Armington, 1969). Figure 2.1 outlines the structure of standard GTAP model in a form of tree diagram.

Figure 2.1. Structure of the GTAP Model



Source: Authors'

On the right-hand part, economic welfare of the representative regional household in region s, U_s , is determined by private consumption, U_s^p , of goods and services (QP_{is}), savings, U_s^s , and public expenditures, U_s^g , on QG_{is} . Goods and services are composed of domestic products (QPD_{is}, QGD_{is}) and imports (QPM_{is}, QGM_{is}). Here, the substitution between domestic and imported goods is based on product differentiation by the place of origin. Further, the imports are also differentiated by the sources where the goods are produced (QXS_{irs}). The left-hand part of the tree diagram describes the production of good QO_{js} . Under the constant return to scale production technology, value added items (QVA_{js}) such as labor and capital are assembled with intermediate inputs (QF_{ijs}) that is again subject to the product differentiation by the place of origin.

GTAP Database Version 9

Because of the direct use of the 140-region and 57-sector GTAP database for our simulation is costly in computation, we aggregate the GTAP database to 23 regions and 22 sectors (Appendices 4a, 4b). It should be noted here that the simulation results could be affected by the degree of aggregation.

Tariff barriers

The aggregated GTAP database is used to compute average applied import tariff rates. For Viet Nam, Table 2.1 shows imports from the TPP and AEC partners and associated average applied import tariff rates by sector. Total imports of Viet Nam in 2011 amounts to about 121 billion USD, of which the imports from the TPP partners accounts for one fourth, about 30 billion USD, whereas the AEC partners 17 percent or 21 billion USD. Most of the imports are concentrated in two manufacturing sectors; chemical and metal products

(MProc) and other manufactured products (OthMnfc). For instance, the table indicates that the Viet Nam's MProc imports from the TPP counterparts is about 12 billion USD and subject to the applied tariff rate by 4.4 percent, whereas OthMnfc imports is 7 billion USD under 6.5 percent tariff rates.

Viet Nam's imports of livestock products are small as compared to the manufactured products. The largest imports of livestock products are dairy products (Dairy) that amount to 448 million USD subject to 4.6 percent import tariffs. Other meat products (OMT) from TPP partners are the second largest (141 million USD), with relatively high import tariff rates (17.5 percent). Imports of livestock products from AEC partners are negligible.

Viet Nam's exports to the world, TPP and AEC partner countries are also reported in Table 2.1. Note that all the figures in the table are evaluated by the partner countries c.i.f. import values, so that the average applied import tariff rates can be computed. Viet Nam's total exports surpass 100 billion USD, and main sectoral exports are OthMnfc, MProc, and Apparel. Similarly, for TPP partners, Viet Nam exports mostly manufactured products. The largest sectoral export to TPP members is Apparel (7.3 billion USD) and it faces relatively high average applied import tariff rates of 10.8 percent. The highest tariff rate is observed for Rice exports from Viet Nam (33.5 percent), followed by Dairy exports (22.3 percent). For AEC tariff rates are also relatively high for Rice (5.4 percent for import to Viet Nam and 21.9 percent for export from Viet Nam), Dairy (5.8 percent and 15.3 percent, respectively), and ProcFood (6.8 percent and 9.3 percent, respectively). However, the amounts of exports of Rice and especially Dairy are not significant in value as compared to the other manufacturing products. In general, we are expecting to observe larger changes in export volumes which are subject to higher tariffs, once the TPP partners remove the import tariffs.

Table 2.1. Viet Nam's Imports and Exports and Applied Tariff Rates

	Total imports, USD, mil.		Imports from TPP partners		Imports from AEC partners		Exports to TPP partners		Exports to AEC partners	
	USD, mil.	Tariffs (%)	USD, mil.	Tariffs (%)	USD, mil.	Tariffs (%)	USD, mil.	Tariffs (%)	USD, mil.	Tariffs (%)
Rice	47	0	0	24.4	5	5.4	426	33.5	1,968	21.9
OthCrops	5,088	1,799	1,799	1.6	443	4.0	1,722	0.4	443	6.6
Cattle	19	17	17	1.8	2	0.0	1	0.0	0	0.0
OAP	270	125	125	0.7	11	2.1	105	0.6	11	3.9
CMT	795	27	27	13.6	0	6.4	0	0.9	0	6.5
OMT	307	141	141	17.5	6	7.7	4	3.0	4	4.0
RawMilk	1	0	0	0.0	0	0.0	0	0.0	0	0.0
Dairy	582	448	448	4.6	28	5.8	2	22.3	16	15.3
Forestry	376	56	56	0.2	179	0.1	4	0.6	3	3.2
Fishing	224	34	34	1.4	24	1.0	105	0.8	11	1.3
CMOG	610	85	85	1.8	164	0.2	5,412	0.3	2,571	0.6
ProcFood	7,538	1,875	1,875	12.1	2,115	6.8	3,163	2.9	774	9.3
Textiles	11,624	1,101	1,101	7.2	835	2.8	3,150	8.4	686	2.9
Apparel	1,340	59	59	13.2	23	5.2	7,330	10.8	52	4.8
LSMnfc	1,520	165	165	3.5	138	4.6	3,735	14.6	282	3.2
WoodProducts	3,252	838	838	6.1	1,275	2.9	3,998	0.4	183	3.4
MProc	45,671	11,630	11,630	4.4	9,950	4.5	3,837	1.0	3,253	5.5
ElecEquip	9,083	2,338	2,338	0.9	1,457	0.9	1,630	0.2	1,048	1.1
OthMnfc	25,607	7,111	7,111	6.5	3,717	5.6	5,840	0.7	1,393	5.5
Util_Cons	646	114	114	0.0	19	0.0	74	0.0	23	0.0
TransComm	2,679	528	528	0.0	147	0.0	508	0.0	101	0.0
OthServices	4,194	1,131	1,131	0.0	150	0.0	912	0.0	122	0.0
Total	121,474	29,623	29,623	4.9	20,687	4.3	41,959	4.7	12,945	6.6

Note: Viet Nam's exports are based on the partner countries' c.i.f. import values.

Source: Authors' calculation from GTAP Database version 9

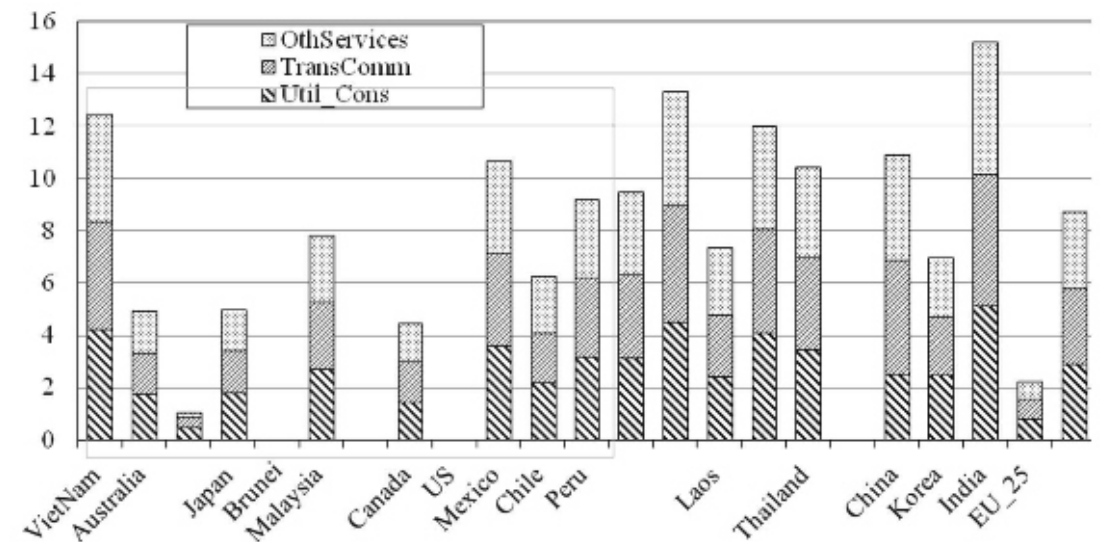
Non-tariff barriers

In this study, the non-tariff barriers are assumed to include services trade barriers and logistic, which is represented by time delays in trade

For the services trade, there is no tariff data reported in the GTAP database. It is a challenging and difficult task to obtain tariff equivalent information with respect to bilateral services trades. There are some attempts to estimate tariff equivalents of services trade barriers, such as Francois, Norberg and Thelle (2007), Thelle, Termansen, Birkeland and Francois (2008). Their estimation is based on sector specific gravity model, and country average of tariff equivalents are obtained from estimation results. It is rather extreme to assume that all the tariff equivalents of services trade can be eliminated by trade liberalization, given the existence of natural trade barriers for example.

For the logistic, Minor and Hummels (2011) estimates the average cost of time delays in trade, and which can be another form of non-tariff barriers. Their estimates can be used with the World Bank's Doing Business Survey that provides on logistic time of importing merchandise goods.

Figure 2.2. Reduction in Tariff Equivalents of Services Trade (%)

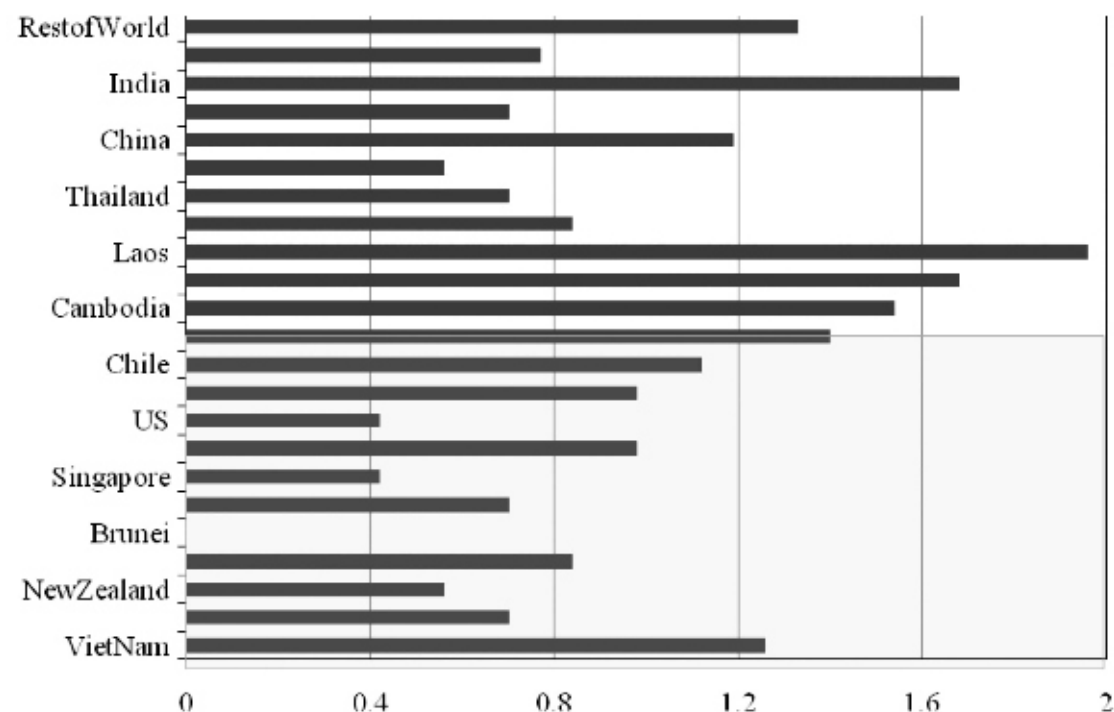


Source: Authors' calculation based on Francois et al. (2007), Thelle et al. (2008), Wang et al. (2009) and Hayakawa and Kimura (2015)

Following the empirical study by Hayakawa and Kimura (2015) we assume that the TPP will lower the non-tariff barriers by 7 percent. Besides, the improvement of services trade and logistics in TPP countries, in reality, is the advancement of the whole trading system in these countries. As a result, in the optimistic scenarios, we assume that the 7 % reduction in non-tariff barriers can be spread to all 23 regions thanks to the spillover effect of trade facilitation. The size of reduction in tariff equivalents of services trade is reported in Figure 2.2. Note that Singapore and the US are used as benchmark countries, and Brunei does not have an

estimate due to data limitation. Figure 2.3 reports the amount of days to import to be reduced, except for Brunei where the estimate is not available.

Figure 2.3. The amount of days to import to be reduced



Source: Authors' calculation based on Minor and Hummels (2011)

Main Assumptions

Regarding our simulation, several assumptions are made. We simulate removals of tariffs and reductions in non-tariff barriers for the TPP and AEC member countries based on the GTAP Database version 9 with the benchmark year of 2011 and additional data. They are not reflecting the actual year of the TPP implementation, but we assume that the tariff rates and estimated non-tariff barriers are approximately close to the actuals. As we apply the comparative static GTAP model, we assume the followings: no explicit treatment of time, perfectly competitive markets, constant returns to scale production technology, fixed endowments of primary factor inputs such as land, natural resources, capital, skilled and unskilled labor for production activities. Goods and services are allowed to move across borders but not for the primary factors.

Scenarios

In this study, we construct 6 scenarios to be used in GTAP model:

- Tariff removal for the TPP partner countries,
- Scenario a + 7% reduction in non-tariff barriers (NTBs) for the TPP partner countries
- Scenario a + 7% reduction in NTBs for all countries/regions

- Tariff removal for the ACE partner countries
- Scenario d + 7% reduction in NTBs for all AEC partner countries
- Tariff removal for TPP and AEC countries + 7% reduction in NTBs for all countries/regions

Aiming at assessing the impacts of international integration, particularly the TPP and AEC, on the Vietnamese economy and its livestock sector, the 6 scenarios are designed regarding the scope of trade liberalization. The first 5 scenarios are to simulate the effects of joining TPP and AEC separately, while the last one is for the joint impact of the implementation of both blocs.

The first 3 scenarios deal with the impacts of tariff removal or/and reduction of ad valorem equivalents of NTBs when TPP comes into effect. In scenario a, tariffs are lifted completely while NTBs still remain. In scenario b, intra-TPP trade is further liberalized by an additional reduction of 7% ad valorem equivalent of NTBs due to the improvement in logistics and services as signatory countries' commitment of trade facilitation. Scenario c implies that this enhancement of logistics and services will not only benefit TPP countries but also non-TPP countries thanks to the spillover effect.

Similar to the first 2 scenarios, scenario d and e simulate the case when tariffs and NTBs are lifted among AEC countries.

Finally, scenario f is for the broadest case when both TPP and AEC are implemented, therefore tariffs among countries joining these two blocs will be removed completely plus a 7% cut of NTBs for all countries/regions in the world owing to the spillover of trade facilitation to global scale.

The scenarios we proposed are not able to cover all the topics discussed under TPP and AEC. Our simulations only cover tariff removal and non-tariff barriers cut for goods and services under TPP and AEC. The simulations are carried out using RunGTAP and GEMPACK.

ANALYSIS OF THE IMPACTS OF TPP AND AEC ON VIET NAM'S ECONOMY

This section is devoted to presenting and discussing the results of the simulation exercises using the model we described above. The impacts of TPP and AEC on various aspects of Viet Nam's macroeconomy and its sectors in relation to its trading partners and competitors are provided. It should be noted that changes in the main economic indicators discussed below are under the impact of TPP and/or AEC only. Other factors such as technology growth, possible economic crises, and government policies... can promote or hinder these changes in the economy.

Real GDP¹

Table 2.2 reports the simulation results on real GDP obtained from the six scenarios. Impacts on real GDP are computed both in percent change as well as change in million USD

1. As GTAP 9 has base year of 2011, real GDP = nominal GDP in 2011

measured in 2011 constant prices. Viet Nam's increase in real GDP stands out in percent change for all three scenarios of TPP (scenario a, b, and c) and scenario f for TPP and AEC. Given the fact that scenario d and e of AEC result in positive but small gain in real GDP, it can be reasonably understood that liberalization components of TPP are the driving forces generating gains in real GDP.

As the liberalization of TPP extended from the removal of import tariff (scenario a) to the reduction in non-tariff barriers (scenario b and c), the gains accrued to real GDP are increasing for all TPP partner countries. However, in AEC scenarios (scenario d and e), countries participating in TPP only, namely Japan, Australia, the US, etc., hardly experience any effect on real GDP. Meanwhile, similar to Viet Nam, countries joining both blocs such as Brunei, Malaysia and Singapore gains significant increases in real GDP in all scenarios. In contrast, the rest which belongs to neither of these two blocs, with the outstanding example of China and India, will be worse off after TPP and/or AEC being implemented, depending on scenarios.

Table 2.2. Simulation Resultson Real GDP (% change, billion USD)

	% Change						Change in billion USD					
	a	b	c	d	e	f	a	b	c	d	e	f
VietNam	1.03	1.32	2.11	0.11	0.28	2.04	1.40	1.79	2.86	0.15	0.38	2.77
Australia	0.07	0.12	0.20	0.00	0.00	0.19	0.96	1.65	2.74	-0.02	-0.02	2.69
NewZealand	0.06	0.11	0.15	0.00	0.00	0.15	0.10	0.18	0.24	0.00	0.00	0.25
Japan	0.21	0.23	0.28	0.00	0.00	0.31	12.44	13.80	16.60	-0.09	-0.11	18.36
Brunei	0.19	0.19	0.19	0.16	0.16	0.20	0.03	0.03	0.03	0.03	0.03	0.03
Malaysia	0.14	0.30	0.57	0.12	0.19	0.67	0.41	0.86	1.66	0.34	0.55	1.95
Singapore	0.01	0.07	0.14	0.06	0.09	0.17	0.04	0.19	0.39	0.16	0.26	0.46
Canada	0.22	0.34	0.41	0.00	0.00	0.42	4.00	6.03	7.26	-0.01	-0.01	7.54
US	0.00	0.01	0.03	0.00	0.00	0.03	0.04	1.88	4.19	-0.09	-0.11	4.24
Mexico	0.03	0.15	0.22	0.00	0.00	0.24	0.32	1.74	2.63	0.00	0.00	2.86
Chile	0.01	0.11	0.26	0.00	0.00	0.26	0.03	0.27	0.64	0.00	0.00	0.66
Peru	0.00	0.10	0.27	0.00	0.00	0.27	0.01	0.17	0.46	0.00	0.00	0.47
Cambodia	-0.16	-0.17	0.74	0.12	0.59	0.75	-0.02	-0.02	0.09	0.02	0.08	0.23
Indonesia	-0.02	-0.02	0.25	0.02	0.08	0.35	-0.13	-0.15	2.12	0.21	0.68	2.95
Laos	0.01	0.01	0.69	-0.04	0.45	0.70	0.00	0.00	0.06	0.00	0.04	0.06
Philippines	-0.01	-0.02	0.27	0.08	0.14	0.40	-0.03	-0.04	0.61	0.19	0.30	0.90
Thailand	-0.06	-0.07	0.58	0.10	0.19	0.90	-0.21	-0.24	1.99	0.35	0.65	3.11
RoSEAsia	-0.01	-0.01	0.04	-0.01	0.01	0.06	0.00	0.00	0.02	-0.01	0.01	0.03
China	-0.03	-0.03	0.17	0.00	0.00	0.14	-1.99	-2.24	12.86	-0.14	-0.18	10.77
Korea	-0.03	-0.04	0.22	-0.01	-0.01	0.21	-0.36	-0.43	2.63	-0.07	-0.09	2.48
India	-0.01	-0.01	0.52	-0.01	-0.01	0.50	-0.20	-0.25	9.72	-0.10	-0.12	9.45
EU 25	0.00	0.00	0.17	0.00	0.00	0.17	-0.67	-0.83	29.76	-0.23	-0.27	29.36
RestofWorld	-0.01	-0.01	0.34	0.00	0.00	0.33	-0.85	-1.13	50.14	-0.21	-0.26	49.58

Source: Authors' simulations

However, once the global reduction in non-tariff barriers is implemented under scenario c and f, then even non-TPP and non-AEC member countries are experiencing gains in real GDP. Examples are China, India, EU-25, albeit with different levels of gains as compared to the size of their GDP.

Though remarkable, it should be noted that as Viet Nam's GDP level is small compared to some other members and thus the gain in GDP value is much smaller as measured in dollars, about one eighth of Japan's and one third of Canada's in most scenarios. Remarkably, the US can only achieve considerable gains in GDP value in cases where not only tariff but non-tariff

barriers are partly removed as well. The main reason for this is that import tariffs imposed by the US are already at low rates prior to TPP. Both Japan and the US, being not a member of AEC, stand to lose in cases d and e where only AEC comes into effect. In both TPP and AEC cases, China will lose a small amount but will gain considerably if the removal of tariffs and partial non-tariff barriers by TPP and AEC members spills over to China as well (scenario c and f). The same happens to EU and India. Obviously, the removal of trade barriers can bring considerable benefits in GDP term to all countries.

For scenario b and e, Table 2.3 decomposes the change in real GDP by its components: consumption, investment, government expenditure, and exports and imports. Large increases in investment and consumption (9.2 and 5.1 percent, respectively) in Viet Nam explain the total increase of 1.32 percent in real GDP, offsetting the small decline in export (negative 1.9 percent) and the large increase in imports (11.2 percent) in scenario b. Simulation results show that components of GDP change increase in almost all TPP countries after TPP being in effect. In this scenario, Table 2.3 also shows considerable increases in consumption in New Zealand and Japan and in export in Canada, Japan and Singapore in value terms. On the other hand, import also increases in most countries especially New Zealand, Australia, Canada and Japan. Again, as GDP of these countries are already high, even though percentage changes are small, in value terms, the changes are larger than those of developing countries. In contrast, exports and investment tend to decrease slightly in non-TPP countries.

	Scenario b					Scenario e				
	C	I	G	EXP	IMP	C	I	G	EXP	IMP
VietNam	5.1	9.2	0.2	-1.9	-11.2	1.1	2.6	0.0	-1.2	-2.2
Australia	0.1	0.4	0	0.1	-0.5	-0.0	0.0	0.0	0.0	0.0
NewZealand	0.4	0.3	0.1	0.1	-0.8	-0.0	0.0	0.0	0.0	0.0
Japan	0.3	0.2	0	0.4	-0.6	-0.0	0.0	0.0	0.0	0.0
Brunei	0.2	0.7	-0.1	-0.1	-0.4	0.2	0.5	-0.1	-0.1	-0.3
Malaysia	0.2	1.4	-0.1	1.3	-2.5	0.2	0.6	0.0	0.7	-1.3
Singapore	0.2	0.2	0	0.4	-0.7	0.5	1.0	0.1	1.3	-2.9
Canada	0.3	0	0	0.8	-0.7	0.0	0.0	0.0	0.0	0.0
US	0.1	0	0	0.1	-0.2	-0.0	0.0	0.0	0.0	0.0
Mexico	0.1	0	0	0.3	-0.3	0.0	0.0	0.0	0.0	0.0
Chile	0.1	0.1	0	0.1	-0.2	0.0	0.0	0.0	0.0	0.0
Peru	0.1	0.1	0	0.3	-0.4	0.0	0.0	0.0	0.0	0.0
Cambodia	-0.7	-0.5	0	0.3	0.8	-0.0	2.5	-0.2	3.3	-5.1
Indonesia	0	-0.1	0	0	0.1	0.0	0.2	0.0	0.3	-0.5

	Scenario b					Scenario e				
	C	I	G	EXP	IMP	C	I	G	EXP	IMP
Laos	1.6	2.7	1	-4	-1.3	0.3	2.0	0.1	1.6	-3.6
Philippines	-0.1	-0.1	0	0.1	0.1	0.4	0.3	0.0	0.3	-0.9
Thailand	-0.2	-0.4	0	0.2	0.4	0.2	1.3	0.0	1.0	-2.2
RoSEAsia	0	-0.1	0	0.1	0.1	-0.0	0.1	0.0	0.2	-0.3
China	0	-0.1	0	0	0.1	-0.0	0.0	0.0	0.0	0.0
Korea	-0.1	-0.1	0	0	0.1	-0.0	0.0	0.0	0.0	0.1
India	0	-0.1	0	0	0.1	-0.0	0.0	0.0	0.0	0.0
EU 25	0	-0.1	0	0.1	0.1	-0.0	0.0	0.0	0.0	0.0
RestofWorld	0	-0.1	0	0	0.1	0.0	0.0	0.0	0.0	0.0

Source: Authors' simulations

Meanwhile, results for scenario e reveals that Viet Nam gains the largest increases in GDP components, albeit smaller than in TPP case. However, while imports increase, exports drop slightly and investment increase by a small amount, leading to the small improvement of Viet Nam's GDP. Different from scenario b, in case AEC becoming into effect, the impacts of AEC on non-AEC countries are not clear, except small changes in their GDP components and the trend of small increases in imports.

Investment

Being the leading factor to explain the gain in real GDP, the changes in investment are reported in Table 2.4. It is clearly seen that the increase in investment in Viet Nam is the most outstanding as compared to other countries in both percentage change and in value terms. The results indicate that TPP will stimulate Viet Nam's fixed capital formation that is defined as investment in the model. For AEC (scenario d and e) investment in Viet Nam grows at a lesser extent, partially reflecting the fact that share of AEC partners in Viet Nam's total trade is less than half of TPP partners. It is interesting to note that Cambodia expands investment substantially under the AEC scenarios.

Simulation results show that almost all member countries gain positive changes in investment and vice versa, non-members see declines in their investment once TPP and/or AEC come into effect. In particular, the total investment in all TPP countries rises especially in scenarios of reduction in NTBs. In value terms, Japan also shows similar increases in investment to Viet Nam's but again these are very modest in terms of percentage. Only-AEC members such as Thailand, Laos and Indonesia are likely to see decreases in investment in TPP scenarios and increases in cases of AEC implementation.

Table 2.4. Simulation Results on Investment (% change, billion USD)

	% change						Change in billion USD					
	a	b	c	d	e	f	a	b	c	d	e	f
VietNam	25.33	27.05	29.81	6.86	8.11	30.62	10.73	11.46	12.63	2.91	3.44	12.97
Australia	1.56	1.69	1.58	-0.07	-0.09	1.50	5.76	6.27	5.86	-0.26	-0.32	5.53
NewZealand	1.48	1.69	1.40	-0.07	-0.08	1.41	0.46	0.52	0.43	-0.02	-0.02	0.43
Japan	0.77	0.89	0.59	-0.23	-0.26	0.99	9.24	10.66	7.05	-2.73	-3.11	11.87
Brunei	3.90	3.81	3.35	3.17	3.15	3.49	0.13	0.13	0.11	0.10	0.10	0.11
Malaysia	5.68	6.28	6.27	2.21	2.64	7.02	3.97	4.39	4.38	1.55	1.85	4.91
Singapore	0.33	0.69	0.62	2.83	3.35	1.82	0.25	0.52	0.46	2.12	2.50	1.36
Canada	-0.27	0.10	-0.12	-0.04	-0.05	-0.17	-1.13	0.40	-0.49	-0.16	-0.19	-0.71
US	0.13	0.26	-0.12	-0.09	-0.10	-0.35	3.77	7.40	-3.38	-2.47	-2.84	-10.17
Mexico	-0.16	0.19	-0.10	-0.04	-0.04	-0.13	-0.39	0.46	-0.25	-0.09	-0.10	-0.32
Chile	0.12	0.32	0.06	-0.03	-0.04	0.09	0.07	0.18	0.04	-0.02	-0.02	0.05
Peru	0.00	0.55	1.13	-0.03	-0.03	1.00	0.00	0.22	0.46	-0.01	-0.01	0.41
Cambodia	-3.65	-3.79	-0.73	18.26	20.01	39.72	-0.08	-0.08	-0.02	0.39	0.42	0.84
Indonesia	-0.38	-0.46	-0.31	0.59	0.74	1.54	-1.04	-1.25	-0.84	1.62	2.03	4.23
Laos	-0.28	-0.38	0.81	6.13	7.69	7.59	-0.01	-0.01	0.02	0.14	0.17	0.17
Philippines	-0.63	-0.78	-0.14	1.39	1.73	2.90	-0.28	-0.35	-0.06	0.62	0.77	1.29
Thailand	-1.35	-1.55	-0.11	4.78	5.31	12.37	-1.26	-1.45	-0.11	4.48	4.97	11.58
RoSEAsia	-0.34	-0.41	-0.53	0.18	0.23	-0.30	-0.06	-0.07	-0.09	0.03	0.04	-0.05
China	-0.22	-0.27	-0.27	-0.05	-0.06	-0.42	-7.42	-9.36	-9.37	-1.88	-2.19	-14.26
Korea	-0.40	-0.50	-0.26	-0.11	-0.13	-0.49	-1.47	-1.86	-0.95	-0.41	-0.49	-1.83
India	-0.20	-0.25	0.28	-0.05	-0.06	0.16	-1.28	-1.57	1.78	-0.33	-0.38	1.00
EU_25	-0.45	-0.56	-0.14	-0.07	-0.08	-0.32	-14.61	-18.44	-4.66	-2.27	-2.62	-10.35
RestofWorld	-0.36	-0.46	0.15	-0.05	-0.06	-0.01	-11.61	-14.68	4.77	-1.70	-1.99	-0.22

Source: Authors' simulations

Regarding the group of two bloc signatories, Malaysia also gains remarkably from trade liberalization in terms of investment, only following Viet Nam. Investment in others of this group namely Brunei and Singapore also experiences increases to different extents depending on different scenarios. Meanwhile, countries outside of TPP and AEC such as China and the EU will see their investment decline after these agreements come into effect. Nevertheless, the investment decreases in terms of percentage change of these regions remain relatively small.

Trade

On examining the changes in exports and imports of countries belonging to both blocs, we can observe that the impacts of TPP on signatories are greater than those of AEC, not only in investment but also in trade.

Change in import volume to Viet Nam is notably large in terms of percent change (Table 2.5). As mentioned earlier, about one fourth of Viet Nam's imports are from TPP partner countries (Table 2.1), and imports to GDP ratio is high as compared to the other countries (Appendix 5). Given these facts, large responses of import volume to TPP's liberalization are not surprising. For absolute change in import volume, Japan shows the largest increase, whereas the size of Viet Nam's import expansion is comparable to Canada's results. Also notable from the results are the changes in trade directions. Countries within TPP and AEC, in general, increase trade with each other and reduce trade with outsiders. In scenario b, for example, where trade barrier removal is limited within TPP, outsiders such as China and the EU see their imports decline. Similarly, tariff removal in case of AEC improves the intra-region import of ASEAN. In percentage, Cambodia and Laos are the two beneficiaries in imports in AEC scenarios. Meanwhile, countries joining TPP only are likely to decrease their imports such as New Zealand, Australia, the US, etc.

Table 2.5. Simulation Results on Import Volume (% change, billion USD)

	% change						Change in billion USD					
	a	b	c	d	e	f	a	b	c	d	e	f
VietNam	10.98	11.49	12.21	2.19	2.45	12.19	13.34	13.96	14.83	2.66	2.98	14.80
Australia	2.35	2.60	2.97	-0.16	-0.19	3.03	6.05	6.71	7.65	-0.41	-0.50	7.82
NewZealand	2.56	2.88	2.81	-0.09	-0.10	2.96	1.12	1.26	1.23	-0.04	-0.05	1.29
Japan	3.54	3.82	4.09	-0.24	-0.28	5.06	33.86	36.54	39.16	-2.34	-2.71	48.45
Brunei	1.70	1.66	1.43	1.33	1.31	1.42	0.09	0.08	0.07	0.07	0.07	0.07
Malaysia	3.38	3.67	3.73	1.61	1.81	4.21	7.29	7.90	8.04	3.47	3.89	9.08
Singapore	0.53	0.71	0.57	2.43	2.80	1.68	1.38	1.87	1.49	6.37	7.36	4.40
Canada	2.43	2.92	2.97	-0.03	-0.04	3.11	11.56	13.90	14.14	-0.14	-0.17	14.82
US	0.79	1.05	1.02	-0.09	-0.10	1.00	21.08	28.14	27.31	-2.33	-2.73	26.68
Mexico	0.56	1.03	1.00	-0.01	-0.01	1.18	1.79	3.33	3.21	-0.04	-0.04	3.79
Chile	0.56	0.75	0.54	-0.02	-0.02	0.63	0.45	0.61	0.44	-0.01	-0.02	0.51
Peru	0.72	1.77	3.32	-0.01	-0.01	3.33	0.29	0.70	1.33	0.00	-0.01	1.33
Cambodia	-1.28	-1.31	-0.91	7.81	7.91	16.55	-0.14	-0.14	-0.10	0.83	0.84	1.77
Indonesia	-0.57	-0.66	0.06	1.91	2.19	5.94	-1.14	-1.32	0.13	3.81	4.36	11.86
Laos	-0.08	-0.12	0.00	7.24	7.79	6.50	0.00	0.00	0.00	0.29	0.31	0.26

	% change						Change in billion USD					
	a	b	c	d	e	f	a	b	c	d	e	f
Philippines	-0.39	-0.46	0.13	2.13	2.31	4.26	-0.35	-0.40	0.11	1.88	2.03	3.76
Thailand	-0.56	-0.65	0.25	3.29	3.59	7.53	-1.37	-1.61	0.62	8.09	8.84	18.52
RoSEAsia	-0.25	-0.30	-0.24	1.34	1.36	1.99	-0.03	-0.04	-0.03	0.17	0.17	0.25
China	-0.36	-0.45	0.26	-0.14	-0.16	-0.11	-6.64	-8.18	4.76	-2.53	-3.00	-1.96
Korea	-0.23	-0.30	0.31	-0.12	-0.15	0.09	-1.35	-1.80	1.82	-0.72	-0.90	0.55
India	-0.18	-0.23	0.92	-0.10	-0.12	0.74	-0.96	-1.20	4.86	-0.51	-0.61	3.89
EU_25	-0.12	-0.16	0.28	-0.04	-0.05	0.21	-8.56	-11.08	19.59	-2.80	-3.25	14.76
RestofWorld	-0.19	-0.25	0.79	-0.04	-0.05	0.66	-8.13	-10.66	33.17	-1.83	-2.19	27.74

Source: Authors' simulations

Simulation results of change in export volume are reported in Table 2.6. Export gains can be seen in most countries except Viet Nam and Brunei and in some scenarios Australia. Drops in exports in TPP and/or AEC scenarios are reported for this group of economies. At the same time, China and Korea are the two outsiders who gain from TPP with sufficient increase in exports but lose from AEC with shrinking exports. Also gains are remarkable especially in the case of Japan, Canada, the US and EU, while declines are small in all cases.

Table 2.6. Simulation Results on Export Volume (% change, billion USD)

	% change						Change in billion USD					
	a	b	c	d	e	f	a	b	c	d	e	f
VietNam	-2.23	-2.57	-3.15	-1.30	-1.65	-3.63	-2.17	-2.49	-3.06	-1.26	-1.60	-3.53
Australia	0.19	0.30	0.87	-0.03	-0.03	1.03	0.55	0.85	2.45	-0.08	-0.10	2.90
NewZealand	0.17	0.28	0.42	0.00	-0.01	0.49	0.08	0.13	0.20	0.00	0.00	0.23
Japan	2.17	2.24	2.94	0.17	0.19	3.04	20.48	21.12	27.70	1.63	1.81	28.64
Brunei	-0.31	-0.29	-0.20	-0.29	-0.28	-0.21	-0.03	-0.03	-0.02	-0.03	-0.03	-0.02
Malaysia	1.53	1.65	1.82	0.82	0.87	2.10	3.77	4.05	4.47	2.02	2.15	5.15
Singapore	0.27	0.32	0.22	0.92	1.05	0.67	0.87	1.03	0.72	3.00	3.43	2.20
Canada	2.91	3.13	3.45	0.00	0.00	3.63	13.99	15.04	16.59	0.02	0.02	17.45
US	0.60	0.67	1.26	0.07	0.07	1.75	11.38	12.60	23.70	1.24	1.39	33.00
Mexico	0.78	1.04	1.32	0.01	0.01	1.54	2.75	3.66	4.64	0.04	0.05	5.41
Chile	0.23	0.32	0.49	0.00	0.00	0.56	0.21	0.30	0.46	0.00	0.00	0.52
Peru	0.65	1.01	1.78	0.01	0.01	1.89	0.32	0.50	0.88	0.00	0.00	0.93
Cambodia	0.42	0.44	0.11	5.85	5.61	5.82	0.04	0.04	0.01	0.57	0.55	0.57

	% change						Change in billion USD					
	a	b	c	d	e	f	a	b	c	d	e	f
Indonesia	0.06	0.10	1.02	1.04	1.19	4.24	0.12	0.20	2.11	2.15	2.45	8.77
Laos	0.36	0.41	-0.19	4.90	4.37	3.65	0.01	0.01	-0.01	0.15	0.14	0.11
Philippines	0.24	0.30	0.50	0.96	0.88	2.61	0.17	0.21	0.34	0.66	0.61	1.80
Thailand	0.24	0.25	0.63	1.51	1.58	2.96	0.61	0.63	1.59	3.82	3.99	7.48
RoSEAsia	0.51	0.62	0.90	1.71	1.66	3.16	0.05	0.06	0.08	0.16	0.15	0.29
China	0.05	0.08	1.03	-0.01	-0.02	0.96	1.13	1.68	22.14	-0.23	-0.32	20.62
Korea	0.09	0.10	0.59	-0.01	-0.02	0.60	0.56	0.63	3.67	-0.04	-0.10	3.69
India	0.16	0.19	1.81	0.00	0.00	1.86	0.61	0.71	6.78	0.02	0.00	6.95
EU_25	0.14	0.17	0.39	0.01	0.01	0.43	9.57	11.92	26.31	0.61	0.68	29.06
RestofWorld	0.09	0.12	0.87	-0.01	-0.01	0.87	4.53	5.67	42.06	-0.53	-0.60	42.17

Source: Authors' simulations

Viet Nam shows negative export volume changes, albeit by a small amount, ranging from 1.2 to 3.5 billion USD depending on scenarios. These negative results can be explained by the shift in Viet Nam's export destination. For example in scenario b, Appendix 7a reports sectoral export volume changes by destinations; exports to TPP partners and to non-TPP countries. Exports to the TPP partners increase by 8.4 billion USD in total, diverting from non-TPP countries by about 10 billion USD. This results in overall export volume change to be negative as observed in Appendix 7a. As relatively high sectoral import tariffs imposed on Viet Nam's exports (Table 2.1) are removed by TPP, the exports of Textile, Apparel, and LSMnfc destined for TPP partner countries increase significantly by 5.8, 4.3 and 1.5 billion USD, respectively. These increases in export volume are attributed to corresponding output increases (Table 2.13).

Given the fixed amount of endowments for production activities, sectors compete over the endowments such as labor and capital for production by offering higher wage rates and rental rates. In scenario b, wage rate for unskilled labor rises by 12.4 percent, for skilled labor by 14.3 percent (Table 2.8), while rental rate of capital increases 13.9 percent. As the price of labor and capital become higher, some sectors contract while other sectors expand (Table 2.13). Taking the other manufacturing sector (OthMnfc) as an example, Table 2.7 reports changes in trade volume for Viet Nam, other TPP members, and non-TPP countries in scenario b, and for Viet Nam, AEC and non-AEC countries in scenario e. For scenario b, Viet Nam's sectoral export volume of other manufacturing decreased by 0.85 and 1.26 billion USD with respect to TPP member and non-TPP countries. Other TPP members increase their export to Viet Nam (3.8 billion USD) and other TPP (31 billion USD), diverting from non-TPP countries (negative 22 billion USD).

Meanwhile, in case of AEC, both exports and imports of OthMnfc between Viet Nam and

AEC experience an increase of 0.6 and 1.7 billion USD respectively. Trade among other AEC members (not included Viet Nam) also rises by 13.3 billion USD after AEC implementation. At the same time, both exports and imports of AEC with non-AEC countries decrease slightly (Table 2.7)

Table 2.7. Trade Volume Changes of OthMnfc (million USD)

		Importer						
		Scenario b				Scenario e		
		Viet Nam	TPP (excl. VNM)	Non-TPP		Viet Nam	AEC (excl. VNM)	Non-AEC
Exporter	Viet Nam	...	-846	-1,263	Viet Nam	...	589	-414
	TPP (excl. VNM)	3,815	31,110	-22,203	AEC (excl. VNM)	1,737	13,336	-2,559
	Non-TPP	-549	-8,462	9,809	Non-TPP	-601	-5,079	176

Source: Authors' simulations

There are a few other possible explanations for the decline in total export value by Viet Nam in addition to changes in trade direction. First, some of Viet Nam's currently main exports, agricultural products and mining, show decline after TPP due to competition in both input and output markets. Though the increase in textile, apparel and shoes/leather is to be expected (especially to the US), it may not be able to compensate for the loss in exports of other declining sectors. Second, even though Viet Nam gains substantially in investment (including FDI), this investment is likely to go into the three major expanding export sectors of Viet Nam and non-tradable sectors such as utilities and construction rather than into the declining sectors. Third, regarding the decline in exports of electronics equipment which is currently one of the key exports of Viet Nam, it is possible that because in 2011 (the base year of current GTAP database), electronics export was still small and the database does not incorporate the current change and that potential competition from Japan and other TPP members when TPP comes into effect might be the reasons for the decline in electronics equipment export in the simulation results. Also, related to modeling, it should be noted that we are using static GE model in this study and thus, the results could not capture the dynamics and therefore might be bias.

The simulation results are based on the assumption of fixed factor endowments as in the standard trade theory. However, this implies no growth in labor (skilled and unskilled)¹, land, capital and natural resources which may not be true in reality.

1. It should also be noted that labor inputs are measured in million USD. GTAP database does not have information on labor input in terms of work hour nor headcount. Value of unskilled labor input in Viet Nam, 2011, is worth 35 billion USD, and value of skilled labor input 16 billion USD. These values correspond to the sum of producer expenditure on unskilled and skilled labor. Let the initial wages for unskilled and skilled to be indexed as unity (1.0), and then the corresponding "quantities" coincide with the labor input values. Therefore, quantity of unskilled labor input is 35 billion USD, skilled 16 billion USD. As we observed from the TPP simulation (for example scenario b), wages rise by 12.4% (unskilled) and 14.3% (skilled). Since "quantities" of labor are fixed or given by assumption as endowments, which is standard and conventional in international trade theory, quantities are same as 34 billion USD and 16 billion USD. However, total values of unskilled and skilled labor inputs are increased because of the rise in wages; 39 billion USD and 19 billion USD respectively.

To examine this assumption on the impacts on export, we relax this assumption on labor in scenario b and e and report the results in Table 2.8. First, we fix wage rate of unskilled labor, allowing the amount of unskilled labor to adjust. The result shows total export volume of Viet Nam increases significantly from negative 2.5 to negative 0.3 billion USD and from negative 1.6 to negative 1.3 billion USD in scenario b and e respectively. Further, we alternate the assumption by allowing both skilled and unskilled labor amounts to adjust, then export volume after TPP turns positive and increases by 2.7 billion USD. However, in scenario e, exports decline though with smaller size of negative 0.6 billion USD.

Sooner than later, Viet Nam will not be able to sustain the advantage of cheap labor due to the increase in demand for skilled labor in particular and economic growth in general like what is happening in China. Obviously, not only free movement of labor among sectors of the economy is needed to facilitate the structural change of the economy after TPP and AEC come into effect, but the need to improve labor quality (i.e. increase the supply of skilled labor through education and training) is also essential in the restructuring progress. These efforts in the labor market can help boost the restructuring process of the economy but also improve export growth and economic growth.

Table 2.8. Changes in Wage Rates and Employment (%) and Export Volume (million USD)

	Unskilled Labor		Skilled Labor		Total Export Volume
	Employment	Wage rate	Employment	Wage rate	
Scenario b	0	12.4	0	14.3	-2,492
Fixed Unskilled Wage	17.7	0	0	19.4	-292
Fixed Wages	19.3	0	26.3	0	2,706
Scenario e	0	3.6	0	3.7	-1,598
Fixed Unskilled Wage	5.1	0	0	5.3	-1,260
Fixed Wages	5.7	0	7.3	0	-636

Source: Authors' simulations

Table 2.9 indicates the changes in exports of selected countries/regions by sector under scenario b. Accordingly, Viet Nam's exports mainly decrease in manufacturing sector such as ProcFood; WoodProducts, MProc, ElecEquip and OthMnfc. In this scenario, total reduction in exports of these sectors amounted to 8.4 billion USD, mainly due to Viet Nam's commodities are hardly able to compete with commodities from other countries such as the US (ProcFood); Japan (MProc and OthMnfc) or China (ElecEquip) after TPP. For example, in other manufactures OthMnfc, exports from Viet Nam fell by more than 2 billion USD, from the US by 9.4 billion USD while Japan, with comparative advantage in this sector, experiences

an increase of up to 16.2 billion USD. Regarding the sector for processed food ProcFood, Canada and the US are the two dominant exporters with the rise of 1.9 billion USD and 4.1 billion USD respectively; whereas that figure of Viet Nam drops by 1.1 billion USD. For MProc goods (gasoline, chemicals, plastics, metals and n.e.c.), Viet Nam (experiencing a drop of 2.1 billion USD) and the US (falling by 1.3 billion USD) lose their export markets to Japan (increasing 4.7 billion USD), Malaysia (2.1 billion USD), Canada (1.1 billion USD) and EU (3 billion USD).

Meanwhile, exports of Apparel and LSMnfc of Viet Nam tended to sharply increase, especially to the US market. It causes the reduction in exports of almost all non-TPP countries. For instance, China's exports in leather, footwear and silk LSMnfc falls by 2.5 billion USD.

Table 2.9. Export Changes by Selected Country and Sector (Scenario b, million USD)

	VietNam	Australia	Japan	Malaysia	Canada	US	Mexico	China	EU 25	Restofworld
Rice	-209	651	17	32	1	6,743	0	-18	3	-8
OthCrops	-549	-274	258	-17	666	-1,174	65	-188	378	416
Cattle	-1	-39	1	0	36	-31	14	1	17	20
OAP	-12	-45	11	6	19	39	-6	-50	-67	-25
CMT	0	1,703	6	0	268	982	34	-6	225	70
OMT	-32	-55	8	-7	7,445	6,283	822	-1,284	-1,543	-1,747
RawMilk	0	0	0	0	0	-1	0	0	0	0
Dairy	-7	-8	17	30	1,564	6,303	1	-4	-441	-32
CMOG	-497	-720	-17	-84	-182	15	-41	23	112	1,865
ProcFood	-1,096	542	505	344	1,940	4,075	63	-631	-754	-815
Textiles	772	-11	214	323	-1	-52	-40	280	72	-183
Apparel	5,227	10	47	1,007	-1	201	-137	-750	-145	-952
LSMnfc	2,931	-141	283	87	34	1,382	-1	-2,504	-393	-164
WoodProducts	-1,371	-31	-75	300	455	-272	112	584	691	220
Mproc	-2,121	-479	4,717	2,052	1,127	-1,325	613	30	2,991	705
ElecEquip	-1,700	-37	-3,412	-740	72	-1,081	602	3,999	1,731	2,166
OthMnfc	-2,107	-121	16,222	803	1,531	-9,385	1,565	189	1,241	517
OthServices	-985	-371	-1,011	-389	17	-2,052	-38	480	3,323	1,306

Source: Authors' simulations

Table 2.10 describes the changes in trade in selected countries and important sectors in scenario e, when tariffs among AEC countries are removed completely and NTBs are partly reduced. In this scenario, except for Rice and OthMnfc (transportation, motor vehicles, machinery, etc.), almost all sectors of Viet Nam have the tendency of contracting exports, in small size though (about 100-350 million USD). Similar situation happens to Indonesia, Thailand and the Philippines, when these countries experience declines in exports of almost all sectors but remarkable surge in OthMnfc exports. Meanwhile, exports of Malaysia and Singapore change most significantly after AEC implementation, mainly in ProcFood, MProc and OthMnfc. In other words, within ASEAN, each economy has its own advantage in a/a number of commodities whose exports can be expanded after AEC comes into effect. In the case of Viet Nam, these export keys are Rice or other manufacturing products (OthMnfc) even though the change remains small. They are ProcFood in case of Malaysia, MProc of Singapore and Malaysia, or OthCrops from Philippines, etc.

Table 2.10. Export Changes by Selected Country and Sector (scenario e, million USD)

	VietNam	Australia	Japan	Malaysia	Singapore	Cambodia	Indonesia	Laos	Philippines	Thailand	China	Korea	India	EU 25	RestofWorld
Rice	674	3	1	22	0	-11	1	-1	6	204	1	0	62	17	1
OthCrops	-273	-56	2	58	1	82	297	49	800	31	-186	-2	-106	28	-288
Cattle	-1	3	0	0	0	-1	0	0	0	0	0	0	0	-1	0
OAP	-7	1	0	18	6	-1	7	0	0	2	3	0	1	2	2
CMT	0	16	0	4	0	-1	3	0	0	28	0	0	6	-2	1
OMT	-13	9	0	14	3	1	-3	0	-7	-82	18	0	0	49	32
RawMilk	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
Dairy	-4	22	0	20	3	0	2	0	9	2	2	0	1	14	5
CMOG	-109	151	3	-217	5	0	-324	24	-52	-20	29	1	12	53	1,450
ProcFood	-180	-38	-14	1,246	556	6	-260	7	47	620	-139	-42	-40	-54	-390
Textiles	-201	1	31	106	26	258	-109	1	-18	-106	79	-19	45	1	-45
Apparel	-313	1	0	27	79	-133	-159	-12	-83	-175	277	-4	44	59	102
LSMnfc	-346	7	0	35	69	107	-161	-1	-8	-54	249	-2	20	83	14
WoodProducts	-327	5	31	-10	241	2	-232	4	-54	-141	76	11	2	139	15
Mproc	-15	-258	188	1,742	5,054	39	6	39	-82	-427	-274	-263	-36	96	-1,316
ElecEquip	-189	7	660	-1,898	-2,701	6	13	1	-1,043	711	798	368	13	440	237
OthMnfc	175	-36	394	1,151	1,904	129	3,170	39	1,392	2,861	-1,141	-35	-167	-2,663	-867
TransComm	-111	52	281	-261	-1,331	9	-140	-6	-190	-966	394	48	54	792	415
OthServices	-285	65	247	-305	-2,431	-39	-82	3	-205	-424	233	103	155	1,075	400

Source: Authors' simulations

With regards to imports by sector and by partner, Viet Nam increases import of MProc, OthMnfc and Textiles. The relation between import volume and output of several sectors such as MProc or OthMnfc can be clearly observed. Instead of producing these products, Viet Nam will tend to import more due to price advantage after tariff removal. On the other hand, for Textile, Viet Nam will continue to do mainly processing in the production chain. Thus, both the import and export volumes for this sector will increase after TPP comes into effect. However, import volume increases faster than export volume. Apparel, however, shows large increases in export while import only increases slightly.

Table 2.11. Import Changes by Selected Country and Sector (scenario b, million USD)

	VietNam	Australia	Japan	Malaysia	Canada	US	Mexico	China	EU 25	RestofWorld
Rice	10	11	7,427	-172	0	91	-8	20	12	123
OthCrops	183	44	47	160	2	886	36	-520	-69	-616
CMT	-36	2	3,026	1	-32	353	7	-78	-32	-148
OMT	144	46	4,524	8	3,987	476	5	5	2	66
Dairy	105	-17	3,411	-7	5,954	426	490	-177	-55	-289
CMOG	20	-1	1,463	-38	38	-907	15	-162	55	-147
ProcFood	895	112	779	251	1,624	1,811	213	-17	-7	24
Textiles	3,290	49	548	360	-86	-325	-182	-32	59	3
Apparel	381	59	444	33	-186	-1,789	-18	-5	206	39
LSMnfc	574	25	57	40	-106	-2,202	-349	-27	661	242
WoodProducts	289	139	718	294	47	1,142	66	-104	-2	-142
Mproc	2,336	525	4,076	3,043	451	5,014	640	-1,160	-833	-1,237
ElecEquip	136	319	1,828	402	27	1,850	142	-187	-62	-174
OthMnfc	3,268	5,067	4,506	2,594	412	8,796	622	-2,931	-3,827	-3,650
Util_Con	217	18	314	42	11	70	4	-33	-286	-234
TransComm	506	244	935	136	54	1,124	98	-245	-497	-347
OthServices	871	288	1,544	296	264	2,039	173	-289	-1,822	-954

Source: Authors' simulations

Within TPP, Japan and Malaysia are countries with large increases in imports of MProc and OthMnfc (this includes Australia as well). For non-TPP, China will witness the largest decline in import of OthMnfc, almost 3 billion USD with TPP coming into effect. For agricultural products, Japan and Canada will both increase import. For example, Japan increases Rice import by 7.4 billion USD, OMT by 4.5 billion USD and Canada increases Dairy import by almost 6 billion USD. The main reason for increase in imports is that the current protection level of these countries for these sectors is currently at very high level.

The table 2.12 illustrates import changes in some sectors in selected countries after AEC takes effect in scenario e. Like exports, after AEC takes effect, Malaysia, Singapore, Indonesia and Thailand are the countries having the greatest increase in imports, mainly in two sectors MProc and OthMnfc.

Table 2.12. Import Changes by Selected Country and Sector (scenario e, million USD)

	VietNam	Japan	Malaysia	Singapore	US	Cambodia	Indonesia	Laos	Philippines	Thailand	China	Korea	India	EU 25	RestofWorld
Rice	10	-8	103	18	-15	1	164	3	142	0	-18	-1	0	3	-50
OthCrops	50	-19	412	46	15	7	30	9	100	37	-39	-14	-6	97	-12
CMT	-10	-8	3	10	-2	1	5	28	14	2	-1	-1	0	-1	1
OMT	15	-34	1	37	-3	14	4	73	14	5	-3	-2	0	-19	-3
Dairy	22	-8	-2	63	-2	6	21	1	22	24	-7	-1	-1	-3	-5
ProcFood	355	-38	165	172	-22	114	341	33	145	270	19	10	-29	34	47
Textiles	-179	-4	40	49	72	-57	37	1	10	40	-2	6	-7	45	15
WoodProducts	102	-86	159	145	-18	9	57	3	30	85	-59	-7	-17	-22	-65
Mproc	868	-486	1,336	2,142	-336	85	1,625	37	324	1,980	-724	-108	-103	-527	-381
ElecEquip	142	-434	-242	-601	-452	15	79	4	-280	720	-449	-102	-43	-117	-139
OthMnfc	1,129	-516	982	1,764	-500	158	1,364	89	523	3,254	-252	-119	-78	-645	-165
Util_Cons	47	-61	37	125	-8	2	21	3	3	81	-6	-2	-2	-36	-21
TransComm	102	-229	98	335	-183	5	121	1	60	286	-196	-96	-49	-451	-181
OthSeryices	188	-230	193	471	-235	6	175	0	70	269	-189	-90	-103	-537	-184

Source: Authors' simulations

Viet Nam also has strong growth in these two sectors, with the increase by 0.87 billion USD in MProc and 1.1 billion USD in OthMnfc respectively. Other sectors in Viet Nam tend to increase imports after AEC takes effect, but only in moderation. This is similar to the rest of ASEAN bloc such as Cambodia, Laos or Philippine. Non-ASEAN members like China Japan, Korea... decrease in imports in almost industries and services.

Output

Sectoral output change in Viet Nam is reported in Table 2.13. Corresponding to the larger increases in sectoral export volume, Apparel, LSMnfc, and Textile expand its production approximately by 5 billion USD (around 44% increase), 3.5 billion USD (28% increase), and 1.3 billion USD (12% increase) for TPP (scenarios a, b, c and f). In contrast, under AEC scenarios d and e, services sectors such as utility and construction (Util_Cons), and transportation and communication (TransComm) expand slightly, whereas other sector outputs contract. Notice that Util_Cons increases its output to support fixed capital formation to meet higher investment demand. Rice production also increases under AEC scenarios by almost 6%, equivalent to nearly 1.2 billion USD. Viet Nam exports rice mainly to neighboring countries (rather than advanced economies) due to consumption preferences, transportation costs and the low quality of Viet Nam's rice, and faces with high import tariff in both AEC and TPP market. The removal of tariffs leads to higher rice export to AEC countries which in turn leads to higher rice output in Viet Nam.

Largest output decline can be seen most prominently in agriculture, forestry and wood products, electronics equipment, mining and manufacturing. These declines come mainly as the result of TPP. Note that as agriculture sub-sectors are small in value terms, large declines in percent terms such as in the case of OMT (mainly pigs and poultry) equivalent to small declines in value term. On the other hand, declines in value term in mining and mining related industries and other manufacturing industries can be up to more than 3 billion USD.

Table 2.13. Sectoral Output Changes in Viet Nam (% change, million USD)

	% change						Change in million USD					
	a	b	c	d	e	f	a	b	c	d	e	f
Rice	-0.55	-0.68	-0.65	5.92	5.86	3.85	-110	-136	-131	1,184	1,173	770
OthCrops	-5.69	-6.04	-6.58	-3.50	-3.73	-8.31	-654	-694	-756	-402	-428	-955
Cattle	3.45	3.75	4.40	0.24	0.43	4.09	44	48	57	3	5	53
OAP	2.12	2.46	3.08	0.21	0.39	2.76	103	120	150	10	19	134
CMT	-2.27	-2.32	-2.34	-1.10	-1.15	-2.95	-2	-2	-2	-1	-1	-3
OMT	-22.67	-23.00	-23.48	-3.47	-3.76	-24.89	-179	-181	-185	-27	-30	-196
RawMilk	-6.81	-7.06	-7.04	-1.69	-1.81	-7.47	0	0	0	0	0	0
Dairy	-6.69	-6.87	-6.84	-1.61	-1.69	-7.22	-72	-74	-73	-17	-18	-77
Forestry	-16.07	-16.87	-18.25	-3.79	-4.41	-18.59	-467	-490	-531	-110	-128	-540

	% change						Change in million USD					
	a	b	c	d	e	f	a	b	c	d	e	f
Fishing	-0.71	-0.65	-0.45	-0.29	-0.28	-0.54	-53	-49	-33	-22	-21	-40
CMOG	-4.97	-5.28	-5.83	-0.87	-1.05	-5.91	-802	-853	-941	-141	-169	-955
ProcFood	-6.87	-7.16	-7.56	-1.83	-2.05	-7.87	-1,503	-1,567	-1,654	-400	-449	-1,722
Textiles	12.28	11.83	10.68	-3.20	-3.69	8.48	1,373	1,322	1,194	-358	-413	948
Apparel	43.45	43.99	43.76	-2.60	-3.01	35.07	5,371	5,437	5,408	-322	-372	4,335
LSMnfc	28.13	27.46	27.22	-3.33	-3.86	23.54	3,608	3,522	3,491	-428	-495	3,019
WoodProducts	-17.99	-18.84	-20.41	-4.39	-5.13	-20.86	-1,777	-1,860	-2,016	-434	-507	-2,060
MProc	-8.74	-9.21	-10.33	-1.44	-1.75	-9.93	-3,250	-3,424	-3,839	-536	-652	-3,693
ElecEquip	-16.28	-16.25	-15.07	-1.81	-1.72	-14.93	-1,965	-1,962	-1,819	-219	-208	-1,801
OthMnfc	-13.36	-13.53	-14.08	-0.13	-0.27	-13.28	-3,016	-3,056	-3,180	-30	-61	-2,999
Util_Cons	13.53	14.46	15.90	3.65	4.34	16.31	5,609	5,997	6,590	1,512	1,798	6,763
TransComm	2.59	2.81	3.16	0.58	0.74	3.17	775	842	946	173	223	950
OthServices	-1.64	-1.74	-1.76	-0.56	-0.57	-1.84	-555	-587	-592	-188	-193	-620

Source: Authors' simulations

Labor Demand

Changes in production are translated into demand for primary factor inputs that include labor, land, capital and natural resources. Sectoral change in demand for un-skilled labor is reported in Table 2.14, and for skilled labor is in Table 2.15. In terms of percentage change, Apparel shows more than 40 percent change in demand for both un-skilled and skilled labor, TPP scenarios. In absolute term measured in million US dollar, Util_Cons resulted in 0.7, 0.8, and 0.9 billion USD (scenarios a, b and c, respectively) for un-skilled labor, and about 0.4 billion USD for skilled labor, to meet the investment demand. Note that the sum of the absolute changes across sectors will become zero, meaning that the resource constraint is binding so as the rise and fall of labor demands are offsetting each other.

Table 2.14. Changes in Demand for Un-Skilled Labor in Viet Nam

	% change						Change in million USD					
	a	b	c	d	e	f	a	b	c	d	e	f
Rice	-2.9	-3.2	-3.3	7.2	7.0	2.4	-85	-93	-96	211	206	70
OthCrops	-7.9	-8.4	-9.0	-3.8	-4.1	-10.5	-278	-294	-318	-132	-143	-371
Cattle	2.1	2.3	2.9	0.4	0.6	3.0	6	7	9	1	2	9
OAP	0.6	0.9	1.5	0.4	0.5	1.5	5	7	11	3	4	11
CMT	-1.5	-1.5	-1.4	-1.2	-1.2	-2.2	0	0	0	0	0	0
OMT	-22.2	-22.5	-22.9	-3.5	-3.8	-24.4	-18	-18	-19	-3	-3	-20
RawMilk	-9.1	-9.5	-9.5	-1.7	-1.9	-9.6	0	0	0	0	0	0
Dairy	-5.8	-6.0	-5.9	-1.7	-1.7	-6.5	-6	-6	-6	-2	-2	-7
Forestry	-17.0	-17.9	-19.3	-4.2	-4.8	-19.7	-180	-189	-204	-44	-51	-208
Fishing	-1.0	-0.9	-0.6	-0.5	-0.5	-0.8	-12	-11	-7	-6	-6	-9
CMOG	-7.0	-7.4	-8.2	-1.3	-1.6	-8.3	-82	-87	-96	-16	-19	-98
ProcFood	-6.0	-6.3	-6.6	-1.9	-2.1	-7.1	-106	-111	-117	-34	-37	-126
Textiles	13.4	13.0	12.0	-3.3	-3.7	9.5	103	100	92	-25	-29	73
Apparel	45.1	45.7	45.6	-2.7	-3.1	36.5	206	209	208	-12	-14	166
LSMnfc	29.4	28.7	28.6	-3.4	-3.9	24.6	218	214	212	-25	-29	183
WoodProducts	-17.1	-17.9	-19.4	-4.5	-5.2	-20.1	-120	-126	-137	-32	-37	-141
MProc	-7.8	-8.2	-9.3	-1.5	-1.8	-9.1	-261	-275	-310	-51	-60	-304
ElecEquip	-15.4	-15.3	-14.1	-1.9	-1.8	-14.1	-93	-92	-85	-11	-11	-85
OthMnfc	-12.5	-12.6	-13.1	-0.2	-0.3	-12.5	-254	-257	-267	-5	-6	-254
Util_Cons	15.0	16.0	17.5	3.5	4.3	17.7	773	825	906	182	221	911
TransComm	3.9	4.2	4.6	0.5	0.7	4.3	191	205	227	22	33	214
OthServices	-0.2	-0.2	-0.1	-0.7	-0.6	-0.5	-6	-7	-4	-21	-19	-16

Source: Authors' simulations

It should also be noted that as the changes in labor demand are measured in monetary term rather than quantity (such as number of working hours or number of labor), similar changes may mean big quantity changes in lower wage sectors such as agriculture, but much smaller changes in higher wage sectors such as manufacturing and services. Therefore, labor absorption from shrinking sectors is an issue not only in terms of skill adjustment but also quantity of labor needed to be absorbed. Also for the case of Viet Nam where underemployment is an issue especially in informal sector, particular attention need to be made to labor absorption.

Table 2.15. Changes in Demand for Skilled Labor in Viet Nam

	% change						Change in million USD					
	a	b	c	d	e	f	a	b	c	d	e	f
Rice	-3.6	-3.9	-4.1	7.2	7.0	1.6	-8	-9	-9	16	16	4
OthCrops	-8.3	-8.8	-9.5	-3.8	-4.1	-10.9	-7	-8	-8	-3	-4	-10
Cattle	1.7	1.9	2.4	0.4	0.5	2.6	0	0	0	0	0	0
OAP	0.2	0.5	1.0	0.4	0.5	1.1	0	0	0	0	0	0
CMT	-3.2	-3.3	-3.4	-1.2	-1.3	-3.9	0	0	0	0	0	0
OMT	-23.5	-23.9	-24.5	-3.5	-3.8	-25.7	-7	-7	-8	-1	-1	-8
RawMilk	-9.5	-9.8	-10.0	-1.7	-2.0	-10.0	0	0	0	0	0	0
Dairy	-7.5	-7.7	-7.8	-1.7	-1.8	-8.1	-3	-3	-3	-1	-1	-3
Forestry	-17.3	-18.1	-19.6	-4.2	-4.8	-19.9	-5	-5	-5	-1	-1	-5
Fishing	-1.3	-1.3	-0.9	-0.5	-0.5	-1.1	0	0	0	0	0	0
CMOG	-7.3	-7.7	-8.5	-1.3	-1.6	-8.6	-37	-39	-43	-7	-8	-44
ProcFood	-7.7	-8.0	-8.5	-1.9	-2.2	-8.7	-52	-55	-58	-13	-15	-60
Textiles	11.2	10.7	9.4	-3.3	-3.8	7.3	33	32	28	-10	-11	22
Apparel	42.3	42.7	42.3	-2.7	-3.2	33.8	74	75	75	-5	-6	60
LSMnfc	27.0	26.3	25.9	-3.4	-4.0	22.4	77	75	74	-10	-11	64
WoodProducts	-18.7	-19.6	-21.2	-4.5	-5.3	-21.6	-51	-53	-58	-12	-14	-59
MProc	-9.6	-10.1	-11.3	-1.5	-1.9	-10.9	-124	-131	-146	-20	-24	-140
ElecEquip	-17.1	-17.1	-16.0	-1.9	-1.9	-15.8	-40	-40	-37	-4	-4	-37
OthMnfc	-14.2	-14.4	-15.1	-0.2	-0.4	-14.2	-112	-113	-118	-2	-3	-112
Util_Con	12.5	13.4	14.7	3.5	4.2	15.1	391	418	458	111	130	473
TransComm	1.2	1.4	1.6	0.5	0.5	1.7	16	18	21	6	7	22
OthServices	-2.1	-2.3	-2.4	-0.7	-0.7	-2.5	-146	-155	-161	-45	-49	-167

Source: Authors' simulations

Economic Welfare

Table 2.16 summarizes the simulation results in terms of economic welfare that is based on regional household income (Equivalent Variation). Most countries participating in either TPP or AEC have economic welfare gains, while welfare loss is reported in those not removing tariffs. For example, TPP signatories such as Australia, New Zealand, Japan and the US experience increase in economic welfare only in case of TPP implementation, and vice versa, suffer in only-AEC scenarios. In contrast, a number of ASEAN countries namely

Indonesia, Philippines and Thailand are better off from AEC and worse off from TPP in terms of welfare. The highest welfare gain in monetary term is Japan under TPP. In percent change term, Viet Nam's gain in economic welfare is the largest. There are a few negative welfare cases in scenario a of TPP (Mexico and Peru) and in scenario d of AEC (Laos and Cambodia). Note that in scenarios a and d only import tariff removal is implemented

Table 2.16. Simulation Results on Economic Welfare (% change, billion USD)

	% change						Change in billion USD					
	a	b	c	d	e	f	a	b	c	d	e	f
VietNam	4.96	5.45	6.55	0.96	1.25	6.56	5.61	6.17	7.42	1.08	1.42	7.43
Australia	0.14	0.19	0.28	-0.01	-0.01	0.28	1.64	2.30	3.33	-0.11	-0.13	3.36
NewZealand	0.58	0.66	0.71	-0.01	-0.02	0.74	0.85	0.97	1.03	-0.02	-0.02	1.08
Japan	0.34	0.38	0.44	-0.03	-0.03	0.55	16.73	18.78	21.35	-1.39	-1.59	26.76
Brunei	0.75	0.73	0.67	0.58	0.56	0.69	0.11	0.11	0.10	0.09	0.08	0.10
Malaysia	0.21	0.43	0.69	0.17	0.29	0.78	0.52	1.05	1.69	0.42	0.72	1.91
Singapore	0.24	0.41	0.59	1.18	1.39	1.09	0.54	0.94	1.34	2.69	3.16	2.48
Canada	0.14	0.28	0.34	0.00	0.00	0.36	2.21	4.39	5.33	0.00	0.00	5.71
US	0.04	0.27	0.08	-0.01	-0.01	0.06	6.01	10.14	11.31	-1.21	-1.40	8.18
Mexico	-0.04	0.11	0.17	0.00	0.00	0.19	-0.38	1.19	1.79	0.02	0.02	1.94
Chile	0.12	0.24	0.34	0.00	0.00	0.35	0.27	0.52	0.74	0.01	0.01	0.78
Peru	-0.02	0.13	0.39	0.00	0.00	0.40	-0.03	0.19	0.57	0.01	0.01	0.57
Cambodia	-1.04	-1.07	0.01	-0.82	-0.32	4.98	-0.12	-0.12	0.00	-0.10	-0.04	0.58
Indonesia	-0.09	-0.10	0.17	0.09	0.15	0.47	-0.63	-0.75	1.25	0.65	-1.13	3.47
Laos	-0.11	-0.13	0.66	-0.13	0.52	0.45	-0.01	-0.01	0.05	-0.01	0.04	0.03
Philippines	-0.13	-0.15	0.22	0.39	0.47	0.77	-0.25	-0.28	0.43	0.75	0.91	1.48
Thailand	-0.43	-0.48	0.40	0.25	0.42	1.59	-1.27	-1.40	1.17	0.73	1.24	4.64
RoSEAsia	-0.07	-0.08	0.00	-0.06	-0.03	0.12	0.03	-0.04	0.00	-0.03	-0.02	0.06
China	-0.09	-0.11	0.10	-0.02	-0.02	0.02	-6.11	-7.26	6.21	-1.10	-1.30	1.41
Korea	-0.12	-0.15	0.20	-0.04	-0.05	0.12	-1.19	-1.50	2.04	-0.45	-0.53	1.25
India	-0.05	-0.06	0.49	-0.02	-0.03	0.44	-0.86	-1.03	8.30	-0.42	-0.49	7.43
EU 25	-0.03	-0.04	0.19	-0.01	-0.01	0.18	-4.85	-6.25	29.26	-1.41	-1.63	26.87
RestofWorld	-0.03	-0.04	0.34	0.00	0.00	0.33	-3.58	-4.96	44.81	0.26	0.20	43.43

Source: Authors' simulations

Once TPP and AEC extend their liberalization to non-tariff barriers, then these cases disappear. Given the fact that TPP and AEC have ambitious liberalization targets beyond the tariff cuts, it can be expected that all participating countries will gain in economic welfare. It is obvious that Viet Nam is among the countries benefiting most thanks to the advantage of belonging to both trade blocs. While some other economies namely Brunei, Malaysia or Singapore gain only 0.7-1.1% of welfare in both AEC and TPP scenarios, the figures for Viet Nam is 6.56% increase in welfare.

Tariff Revenue Reduction

Table 2.17 shows that State budget revenue will decline by almost 1.9 billion USD (roughly 1.4% of GDP in 2011) due to tariff removals of TPP and AEC. Most of this reduction comes from the loss of tariff revenue in MProc (mainly petroleum, chemicals, metals and their products), in OthMnfc (mainly vehicles, machineries and other manufacturing industries) and ProcFood (vegetable oil and fat, sugar, beverages and cigarettes). The loss of revenue due to tariff reduction may lead to effort in raising taxes revenues from other sources by the government which is not advisable. We will discuss this in more detail in the last section.

Table 2.17. Tariff Revenue Reduction in Viet Nam for Scenario f

	Million USD	% in GDP
Rice	-0.28	-0.0002
OthCrops	-45.73	-0.0337
Cattle	-0.30	-0.0002
OAP	-1.08	-0.0008
CMT	-3.61	-0.0027
OMT	-24.93	-0.0184
RawMilk	0.00	0.0000
Dairy	-21.68	-0.0160
Forestry	-0.16	-0.0001
Fishing	-0.70	-0.0005
CMOG	-1.80	-0.0013
ProcFood	-296.06	-0.2184
Textiles	-97.32	-0.0718
Apparel	-8.74	-0.0064
LSMnfc	-11.59	-0.0086
WoodProducts	-63.47	-0.0468
Mproc	-686.56	-0.5065
ElecEquip	-25.51	-0.0188
OthMnfc	-583.56	-0.4305
Util_Cons	0.00	0.0000
TransComm	0.00	0.0000

	Million USD	% in GDP
OthServices	0.00	0.0000
Total	-1873.10	-1.3820

Source: Authors' simulations

In summary, the followings can be concluded from the analysis of GE model's results.

In almost all simulation scenarios, Viet Nam is shown to be the member achieving the largest GDP change in percentage term. However, the economic impact of AEC is insignificant compared to that of TPP. When decomposing the GDP change, it is observed that the increase in GDP, thanks to trade liberalization, comes primarily from the increases in consumption and investment, surpassing the surge in import after tariff cut. Moreover, Viet Nam also gains the most in economic welfare in percentage change.

With regard to investment, the increase in investment is the most impressive figure compared to other countries, slightly higher than that of Japan and almost doubled that of Australia, Malaysia or the US in terms of absolute value. The structure of the Vietnamese economy will experience the contraction of less advantaged or eroding industries (i.e. other meat, dairy, forestry, wood products, mining and other manufactures). In contrast, advantaged industries and those with negligible trade will show expansion in both output and labor demand, especially in textiles, apparel, leather and footwear, utilities and construction. Moreover, there is an obvious mobility of primary factors from contracting industries to expanding ones.

Examining the scenarios assessing TPP's impacts, results show that Viet Nam's trade value with other TPP countries increases in all cases. Meanwhile, Viet Nam will see an increase in imports and a decrease in exports with non-TPP economies. Exports in textiles, apparel, leather and footwear from Viet Nam to the US surge impressively while Viet Nam's total exports slightly declines. The possible reasons for this decrease include the contraction of a number of domestic industries due to the competition from other countries, the competition (and constraint) in primary factors and the change in trade directions from outside TPP to TPP. In particular, once the condition of fixed endowment of labor is relaxed, exports turn to increase because of the labor supply (in crease) and more resources are employed. Unavoidable weaknesses of the model, the static nature and the fixed endowment assumption in particular, also cause bias in the results.

CHAPTER 3

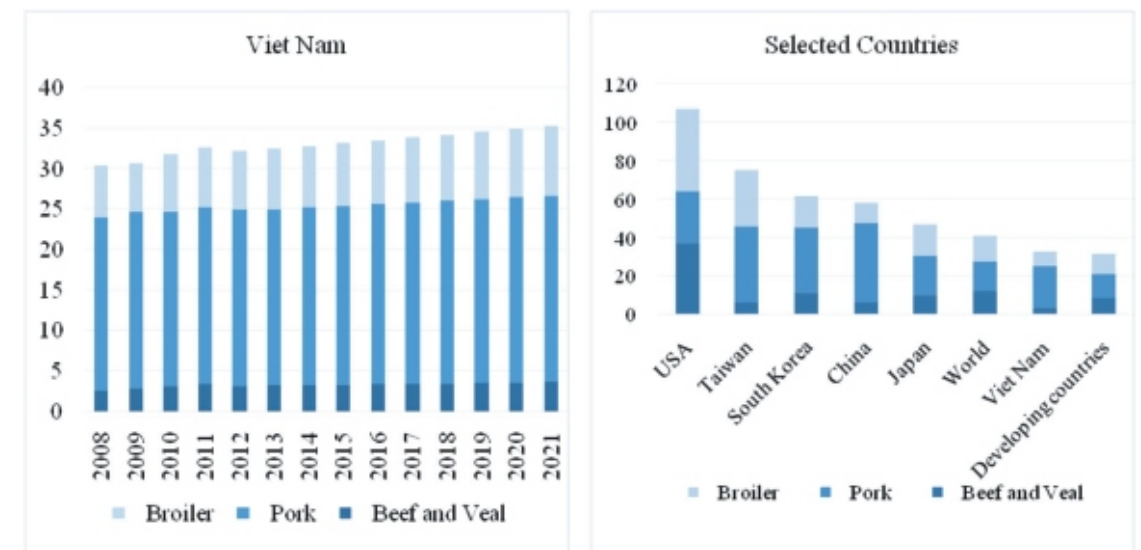
OVERVIEW OF VIET NAM'S LIVESTOCK SECTOR

CONSUMPTION

According to the 2012 Outlook for the US and FAPRI-ISU 2012 World Agricultural Outlook (herein after FAPRI-ISU 2012 Outlook) with the statistics until 2011 and the 2012–2021 forecast, the average amount of carcass consumed per capita of Viet Nam is 32.8 kg per annum in 2011 and is predicted to reach the point of 35.4 kg per capita per year in 2021.

The forecast for meat consumption per capita of Viet Nam in 2014 is 32.8kg/person/year, including 22kg of pork, 7.6kg of chicken and 3.2kg of beef. With the total population of Viet Nam in 2014 at 92.5 million, the total meat consumption of Viet Nam in 2014 is estimated at 3,034 thousand tons, of which 2,074 thousand tons of pork, 703 thousand tons of chicken and 296 thousand tons of beef.

Figure 3.1. Per Capita Meat Consumption of Viet Nam (2008-2021)* and Selected Countries (2015) (kg/p.a.)



*: projection from 2012 to 2021

Source: FAPRI-ISU 2012 Outlook

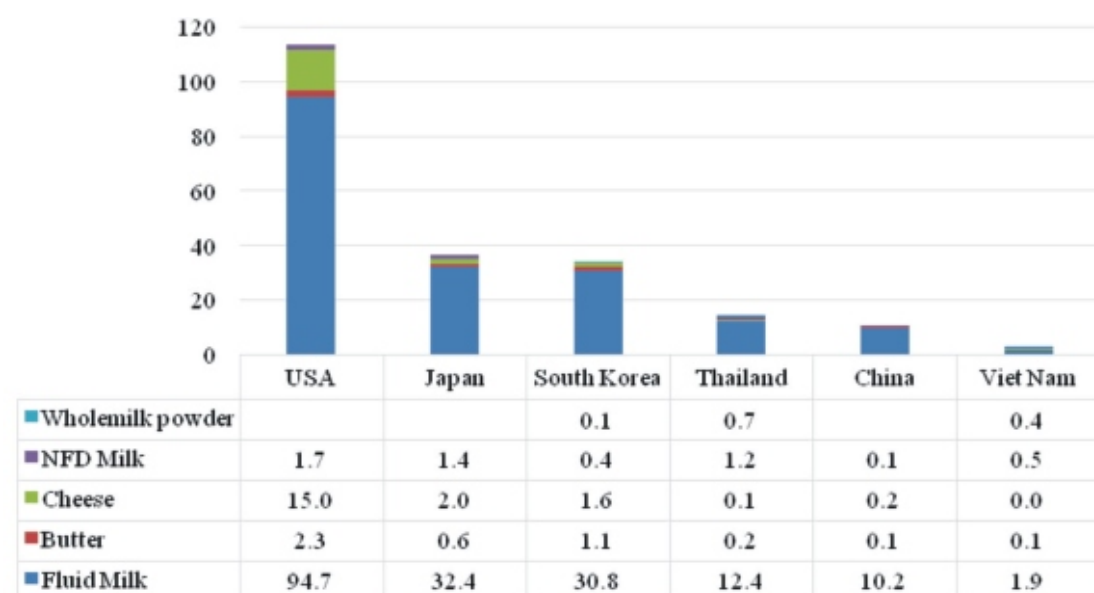
The meat consumption of Viet Nam is quite low in comparison with other Asian countries which have the similar dietary structure such as China, Taiwan, Korea and Japan. According to FAPRI-ISU 2012 Outlook, the projected meat consumption of Viet Nam in 2015 is 33.2 kg per capita per year, slightly higher than the average quantity of developing countries (31.6 kg/capita/year) and lower than the world average figure (41.3 kg/capita/year), than that of Japan (47 kg/capita/year), China (58.3/capita/year), Korea (61.7 kg/capita/year), Taiwan (75.5 kg/capita/year) and the US (107.1 kg/capita/year).

Notably, the consumption of red meat and chicken in Viet Nam remains relatively low.

According to FAO¹ statistics in 2011, while the proportions of red meat and chicken in meat consumption structure of Viet Nam are 9.3% and the 17.5% respectively, swine meat accounts for up to 73.3%. Meanwhile, in per capita meat consumption structure of South East Asia countries, the ratio of red meat for Laos is 33.6%, Cambodia 32%, Malaysia 84%, Thailand 55.7%, Indonesia 55% and Philippines 28%.

Viet Nam's structure of meat consumption is not going to change remarkably until 2021 with pork occupying a large part according to FAPRI-ISU 2012 World Agricultural Outlook. Meat consumption of Vietnamese people is predicted to consist of 66.8% swine meat; 23.4% poultry and 9.8% red meat. Meanwhile the world average figures are 38%, 33.2% and 28.8%, respectively.

Figure 3.2. Per Capita Dairy Consumption in Selected Countries in 2011 (kg/p.a.)



Source: FAPRI-ISU 2012 Outlook

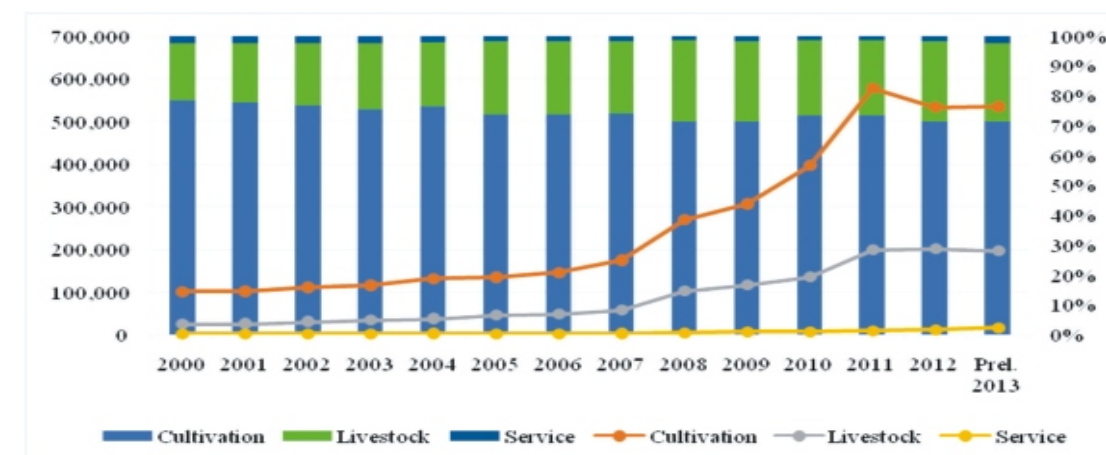
The consumption of milk and dairy products is fairly low. In 2011, Vietnamese consumed 2.9 kg milk and butter (FAPRI 2012 Outlook, in dry weight). This is extremely low compared to the US (113.7kg/capita/year) or other Asian countries which do not have the custom of consuming a great amount of milk and butter like Japan (36,4kg/capita/year) and Korea (34kg/capita/year). Remarkably, the quantity of whole milk powder consumed (main input for reconstituted milk) is relatively high in Thailand (0.7 kg/capita/year) and Viet Nam (0.4kg/capita/year).

1. According to Le Ba Lich, <http://dantri.com.vn/kinh-doanh/cho-nhap-tram-nghin-con-bo-giet-thit-rat-hiem-nuoc-nhu-viet-nam-1435739418.htm> accessed 15/07/2015

Production

The share of livestock in the output of Viet Nam's agriculture increased continuously through the period of 2000-2011, recovering from two epidemic diseases in 2006 and 2010. However, within the last 3 years, the livestock output has reached a plateau at 200 thousand billion VND.

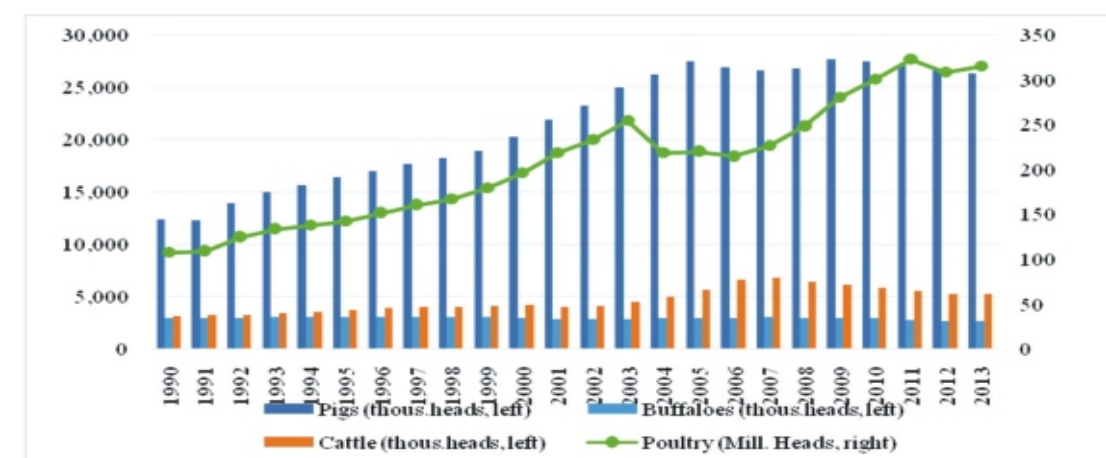
Figure 3.3. Gross Output of Viet Nam's Agriculture, 2000-2013 (billion VND, current price)



Source: Statistical Yearbook of Viet Nam (2014)

Regarding the structure of agriculture, the proportion of livestock sector witnessed a significant increase from about 20% in 2004 to the range of fluctuation of 25 - 27% in the next period, before reaching 26.3% in 2013. This is inversely correlated to the change in the share of cultivation when agricultural services in Viet Nam has not developed and stay at the level of 2% over the years.

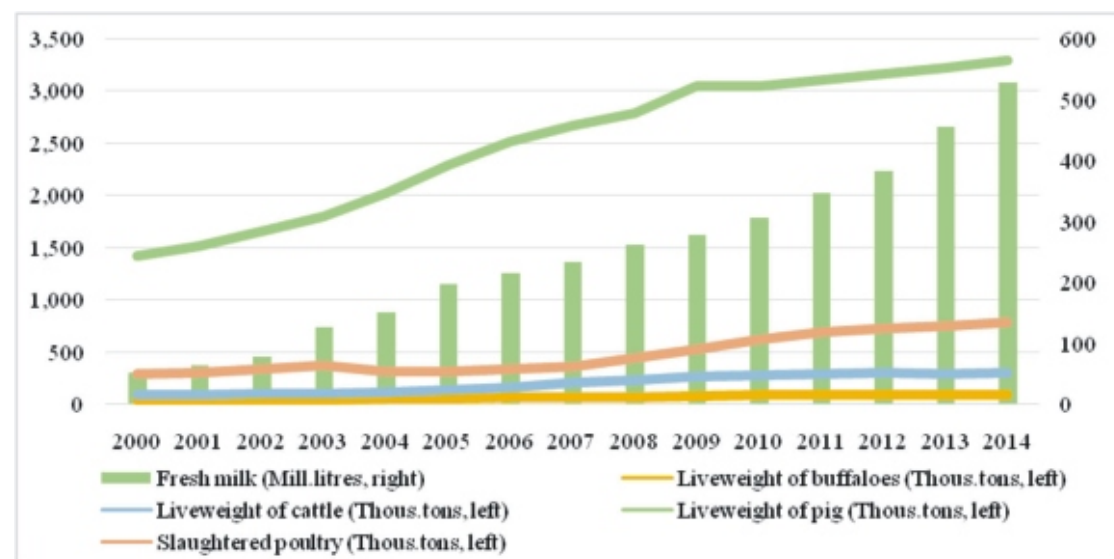
Figure 3.4. Viet Nam's Livestock Population, 1990-2013



Source: Statistical Yearbook of Viet Nam (2014)

Consider the production of livestock sector only, most of livestock population experienced decrease (GSO 2014¹, Table 3.4), together with a stable trend in output of cattle output and a slight increase in the output of poultry and swine, which reflect the stagnation of this sector. The period 2008–2013 witnessed the fall in the population of swine by 1.3% to 26.3 million heads, of cattle by 1.5% to 7.7 million heads in 2013 and a fluctuation trend in the number of poultry around 300 million fowls with the overall increase of 5% per annual.

Figure 3.5. Domestic Livestock Production, 2000-2014



Source: Statistical Yearbook of Viet Nam (2014)

From 2010 to 2014, the average increases in live weight output of swine, poultry, cattle and buffalo were 1.6%, 8.3%, 2.5% and 1.9% per year respectively. As a result, according to 2014 statistics, the total live weight output was 3.3 million tons of pork, 783.8 thousand tons of chicken, 297.4 thousand tons of beef and 86.5 thousand tons of buffalo. Raising milk cows became the most important part in livestock sector with the rise of 14% per year in raw milk output in the period of 2010-2014, reaching 527.5 million liters of milk in 2014 and satisfying 28% of input demand by domestic processing production.

Not only was the decrease in the domestic output of livestock caused by the reduction of domestic population but also by the epidemic disease in Asia region such as avian influenza, porcine reproductive and respiratory syndrome, foot-and-mouth disease. However, the reduction which was caused by disease was not significant. For example, according to 2013 statistics of Vietnamese Department of animal health, at the peak of PRRS in 2010, there were 439.7 thousand of swine died/being destroyed, equal to only 1.6% herd of swine that year.

On the other hand, livestock in Viet Nam is still mainly concentrated on the small-scale households, the share of small and micro households in production structure by farm size remain remarkably high. If using the standard of World Organization for Animal Health (OIE), with rating scale for small farmers is <20LU¹, the size of small household in Viet Nam should

be lower than 55 cattle/household; or 110 pig/household, or 4000-5000 laying hens or broilers/household/year. This criterion is much higher than the standard of small-scale farms of Vietnam.

The General Investigation on Agriculture, Forestry and Fishery in 2011 of GSO showed that: of the total 4131.6 thousand households raising swine, the share of small farms (<10 pigs/household) accounted for 86.4% (in which the number of micro farms (1-4 pigs/household) accounted for 71.6% of total number of livestock households), but supplying only 34.2% of the total swine meat output. As for poultry, with 7864.7 thousand households in total, the number of small farms (<100 poultry/household) made up 89.62% (in which micro scale (1-19 poultry/household) already accounted 54.39%), but produced only 30% of total poultry output.

One of the existing difficulties in the livestock sector is the shortage of land for planting feed ingredients. In the current situation, when land reserved for rice is still large, the value added of the rice sector is not high and the objective of food security for the world does not really make sense; Department of Livestock recommended rice farmers to actively convert their cultivation (i.e. from rice to other higher-value crops or plants used for livestock such as corn, soybeans, grass, etc.) and provinces to encourage and implement policy to promote this conversion. This will be beneficial for farmers in both the cultivation and animal husbandry sectors. By decision No. 825/QD-BNN-TT dated 16.04.2012, and 1006/QD-BNN-TT dated 05/13/2014 of the Ministry of Agriculture and Rural Development, land for feed crops will increase to 100 thousand hectares in 2015 and 300 thousand hectares in 2020 (compared to rice land decreasing to 3.899 million hectares in 2015 and 3.812 million hectares in 2020). However, in reality, this conversion processes very slowly.

VIET NAM'S TRADE OF LIVESTOCK PRODUCTS

Comparing the total carcass weight meat consumption and total carcass-weight meat production (converted from live weight by using the average dressing percentage DP), we can see that there are gaps between supply and demand, especially in items of beef and chicken, while domestic pork production still remains sufficient for domestic consumption. With average dressing DP of about 80% for pig, 75% for chicken and 40% for beef; carcasses yield of the livestock sector in 2014 is about 2,628 thousand tons of pork, 535.16 thousand tons of chicken and 119 thousand tons of beef. Compared this figure with the estimated total domestic consumption in 2014 of 3,034 thousand tons, including 2035 thousand tons of pork, 703 thousand tons of chicken and 296 thousand tons of beef (Author's calculations based on FAPRI 2012 Outlook, p.43), it is obvious that raising domestic production does not meet domestic demand, leading to a demand for imports from abroad.

Regarding milk production, according to the statistics of the Department of Livestock, 2014, the supply of domestic raw milk provided only 28% of the demand for domestic dairy

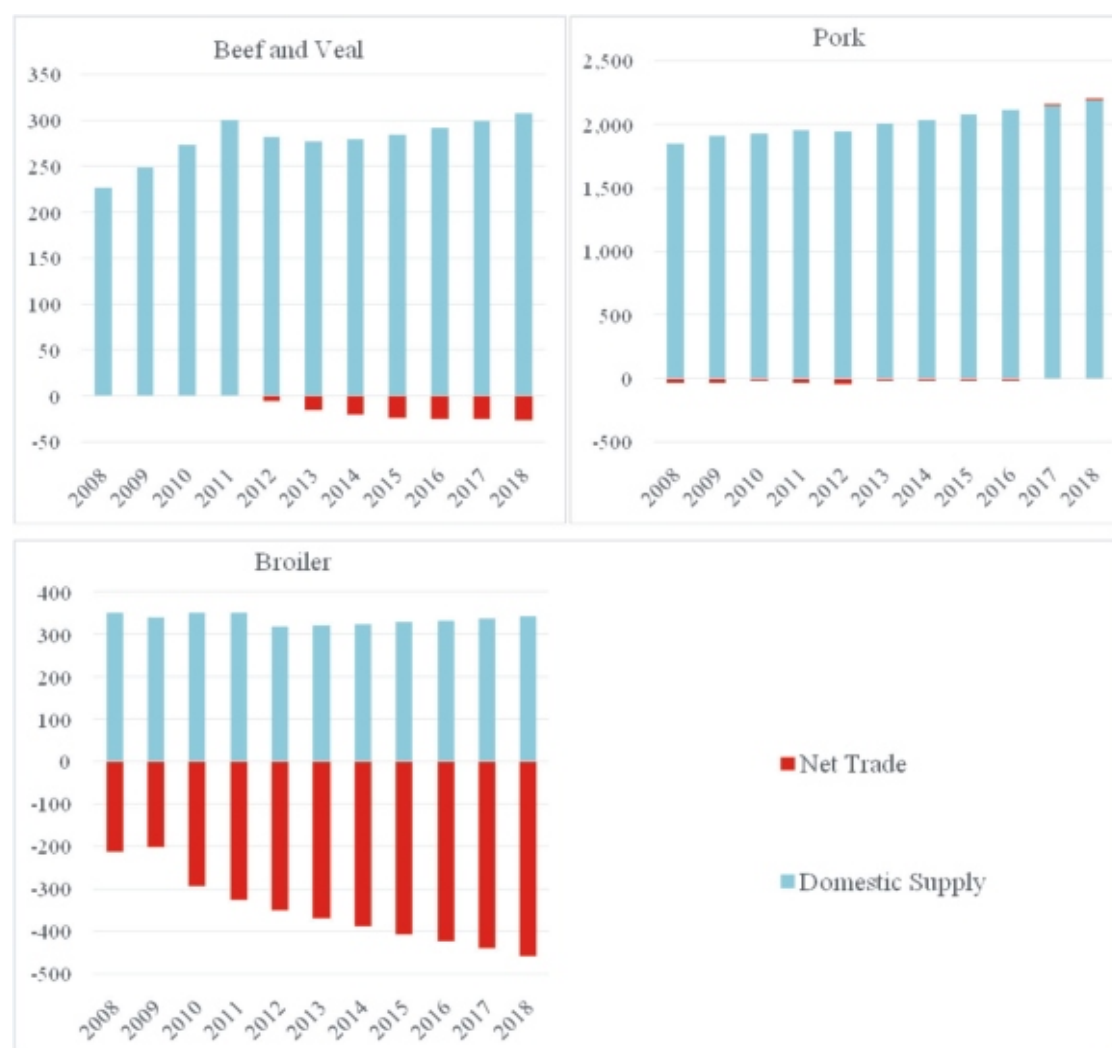
1. 1 LU equivalent to 500 live weight swine meat/year

industry. Thus, imports of raw materials such as milk powder (whole milk powder and skimmed milk powder) are indispensable, despite having the decreasing tendency (from 90% in 2000 to 72% in 2014).

Structure of Consumption by Source

With this situation of consumption and production, according to FAPRI 2012 Outlook, the structure of meat consumption by source in Viet Nam has the following characteristics: almost self-sufficiency for pork products, imported a small fraction for cattle (about 23 thousand tons, or 7.3% consumption) and large quantities for chicken (about 405 thousand tons, equivalent to 55, 2% of consumption) (Figure 3.6).

Figure 3.6. Structure of Meat Consumption in Viet Nam 2008, projected 2018 (thousand metric tons)



Source: FAPRI-ISU 2012 Outlook

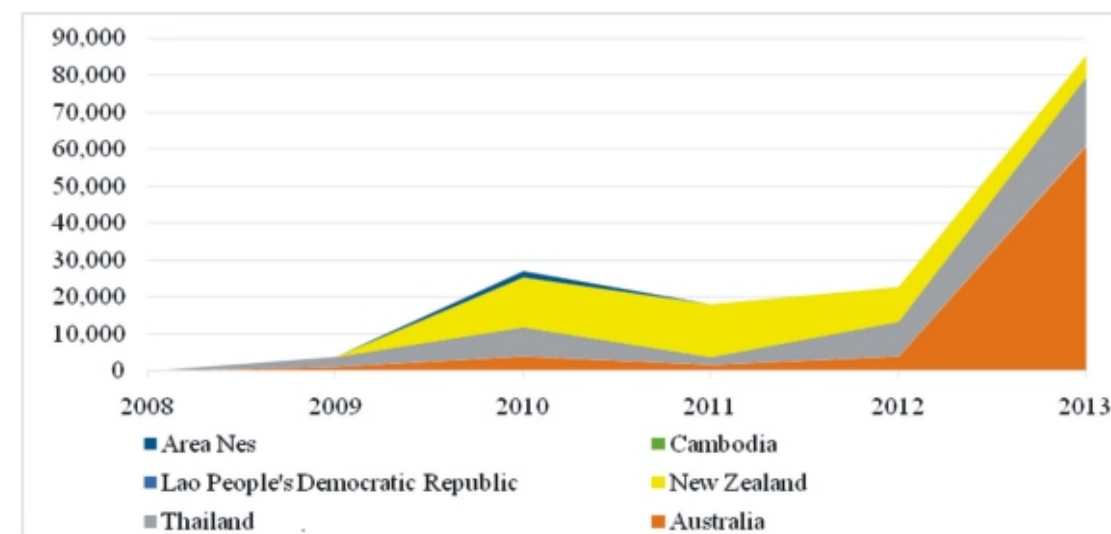
Structure of Imports by Country

Bovine

Live bovine animals imported into Viet Nam increased dramatically over the years, particularly from 2009 to 2012, and mostly from the three countries Thailand, Australia and New Zealand. With geographical advantages and strengths of cattle breeds in Southeast Asia, Thailand is a traditional partner of Viet Nam for imports of live bovine animals, with transportation methods mainly in-land across Laos and Cambodia. Live cattle imported from Thailand are breed, mostly Sin breed, which are skinnier and smaller than cattle of temperate countries with strong cattle sector such as the US, Australia and New Zealand. However, live cattle import turnover from Thailand is not stable, with large fluctuations in the range of 2-18 million over the 2008-2013 period.

After AANZFTA took effect in 2009, lowering the import tariff of live bovine animals to 0% for cattle breeds and 5% for beef cattle; the imports from Australia and New Zealand to Viet Nam increased sharply. Especially in 2010 and 2011, the value of cattle imports from New Zealand reached 13.4 and 14.2 million USD respectively, corresponding to the encouragement of dairy cow husbandry in Viet Nam in this period, by not only raising cow herbs at household level but also in combination with promoting the large-scale dairy farms of TH True milk and Vinamilk. This number decreased steadily over two years 2012 and 2013, mainly due to the fall in demand for imported dairy cows (due to the lower expansion of imported pure-bred HF herds and the increase of domestically crossbred HF such as Cu Chi cows) after two years of strong investment to import purebred HF dairy cattle from New Zealand.

Figure 3.7. Import of Live Bovine Animals (HS0102) to Viet Nam, 2008-2013 (thousand USD)

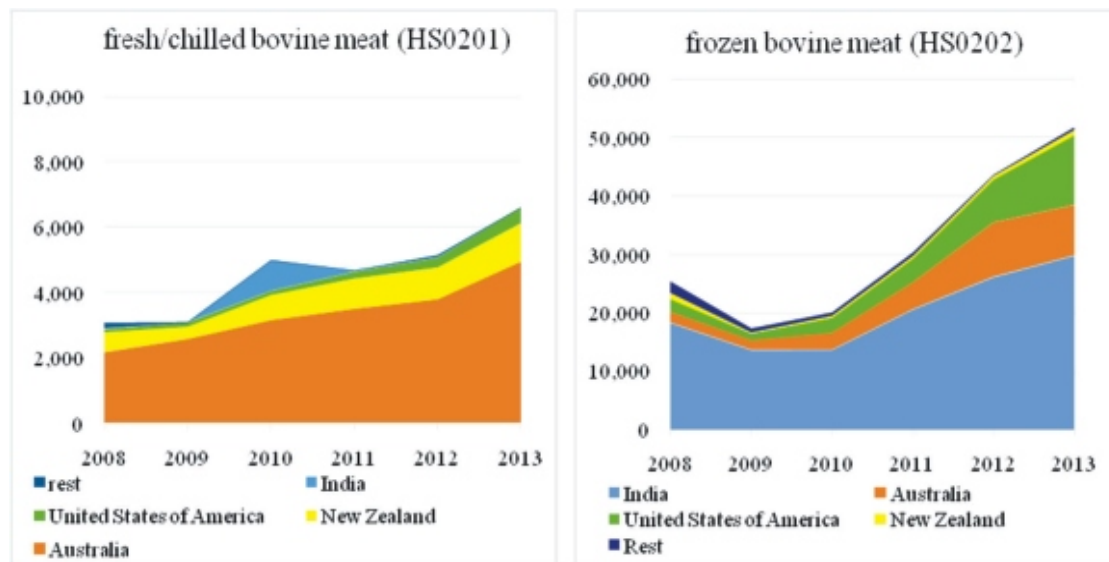


*Note: non-cumulative chart

Source: ITC calculations based on UN COMTRADE statistics

In an opposite trend, live cattle import turnover from Australia have increased gradually over the years, from 1.2 million in 2009 to nearly 61 million in 2013. Live cattle imported from Australia serve two main purposes: breeding (improving breeding of the Sind-crossbred cattle that have low productivity in Vietnam) and fattening and/or slaughtering (importing and providing to slaughterhouses to immediately slaughter like Ket Phat Thinh company or fatten and slaughter as Hoang Anh Gia Lai company and a number of farms in Ho Chi Minh City, Dong Nai, etc.).

Figure 3.8. Bovine Meat Import to Viet Nam, 2008-2013 (thousand USD)



*Note: non-cumulative chart

Source: ITC calculations based on UN COMTRADE statistics.

Bovine meat imported into Viet Nam are classified into two categories: fresh or chilled bovine meat (HS0201) and frozen bovine meat (HS0202). For the chilled meat, the main trade partner of Viet Nam is Australia (import turnover increased by an average of 18%/p.a., from 2.2 million USD in 2008 to approximately 5 million USD in 2013) and a small part from New Zealand (1.2 million USD in 2013) and India (0.5 million USD in 2013).

For the frozen bovine meat (HS0202), the import in 2013 was 58.5 million USD, about 8.8 times of chilled meat (HS0201). Prevailed in the structure of HS0202 imports is frozen buffalo meat from India, increased from under 20 million USD in the years 2008-2011 up to approximately 30 million USD in 2013, nearly five times the total imported chilled buffalo meat (HS0201) of Viet Nam in 2013. In the domestic market, however, Indian buffalo meat products are almost unseen. It can be explained that the Indian buffalo meat is then smuggled to China under the label of buffaloes/cows Viet Nam because India cannot directly export bovine meat to China due to the ban for years by the Chinese Government because of the loose control on diseases of India.

Frozen buffalo meat and beef from the US and Australia are also imported with increasing quantities through the years and competing with each other in Viet Nam market. In 2013, the

import of this product from the US achieved 12 million USD and from Australia 8.6 million USD.

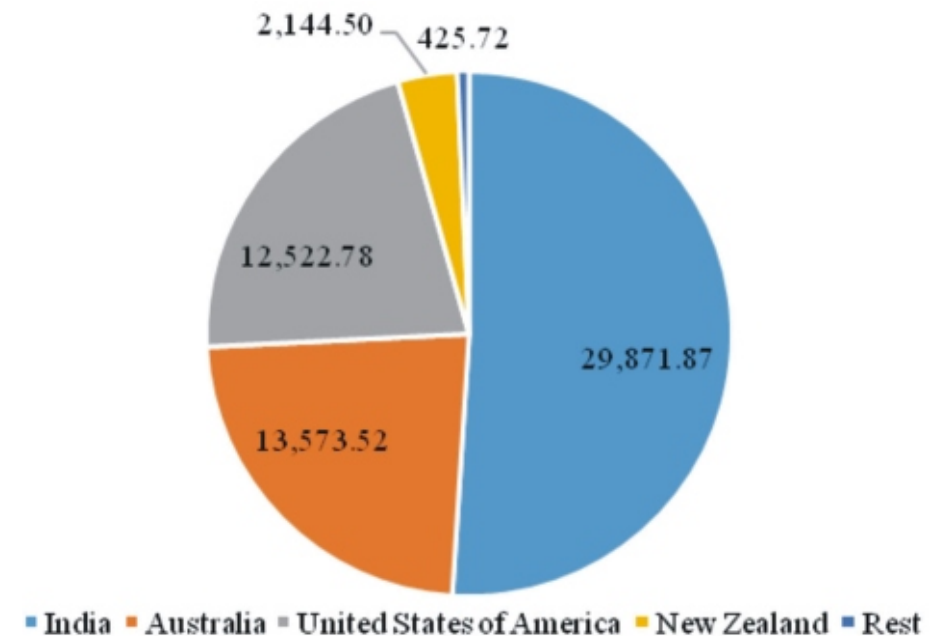


Figure 3.9. Viet Nam's Bovine Imported Value in 2013 (thousand USD)

Source: Authors' calculations based on UN COMTRADE statistics

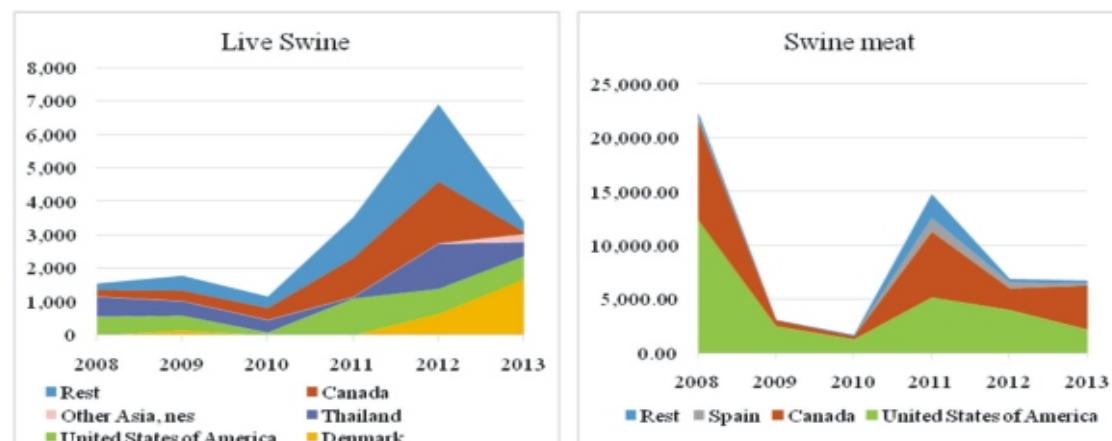
Considering the structure of total import of bovine meat of Viet Nam in 2013 (both chilled meat and frozen meat), India meat accounted for 51%, followed by Australia (23%, equivalent to 13.6 million USD) and United States (21%, or 12.5 million USD) and a small part from New Zealand and other countries.

Swine

According to the livestock experts as well as the UN Comtrade data, the import of live pigs into Viet Nam is mostly for breeding. Import structure of live pig is divided among many countries and changed over the years. In 2013, the import turnover from Denmark strongly increased and occupied the highest proportion (50%), equivalent to 16.6 million USD, followed by the United States (0.7 million USD), Thailand (0.4 million USD) and a small percentage from other countries.

Pork imported into Viet Nam fluctuated sharply over the years, with the highest proportion belonging to the US and Canada. If as of 2008, pork was imported massively, reached 22.3 million, of which 12.3 million USD from the United States and 9.3 million USD from Canada, in 2009-2010 total turnover dropped to 2-3 million USD. After rising up to 14.7 million USD in 2011, pork import was stabilized from 6.7 to 6.9 million USD in the following 2 years.

Figure 3.10. Import of Live Swine (HS0103) and Swine Meat (HS0203) to Viet Nam, 2008-2013 (thousand USD)



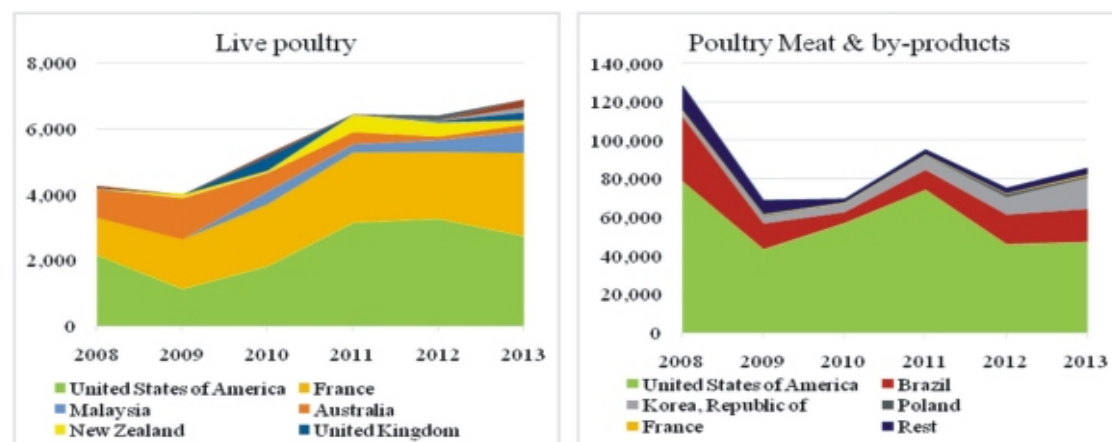
*Note: non-cumulative chart

Source: ITC calculations based on UN COMTRADE statistics.

Poultry

The United States is the biggest partner of Viet Nam in both the live chicken imports (2.7 million USD in 2013, equivalent to 39% of total import of live poultry in Viet Nam) and meat/poultry offal imports (47.2 million USD in 2013, equivalent to 55% of total imports of the meat/poultry offal). As for live poultry, the US must compete with France in Viet Nam's market (i.e. France exported 2.5 million USD live poultry into Viet Nam in 2013). For meat and poultry offal, Brazil and South Korea are the two countries followed the United States in poultry meat and by-products imports to Viet Nam, although the proportion was not large, accounting for 19.8% and 19.1%, respectively.

Figure 3.11. Import of Live Poultry (HS0105) Poultry Meat & by-products (HS0207) to Viet Nam, 2008-2013 (thousand USD)



*Note: non-cumulative chart

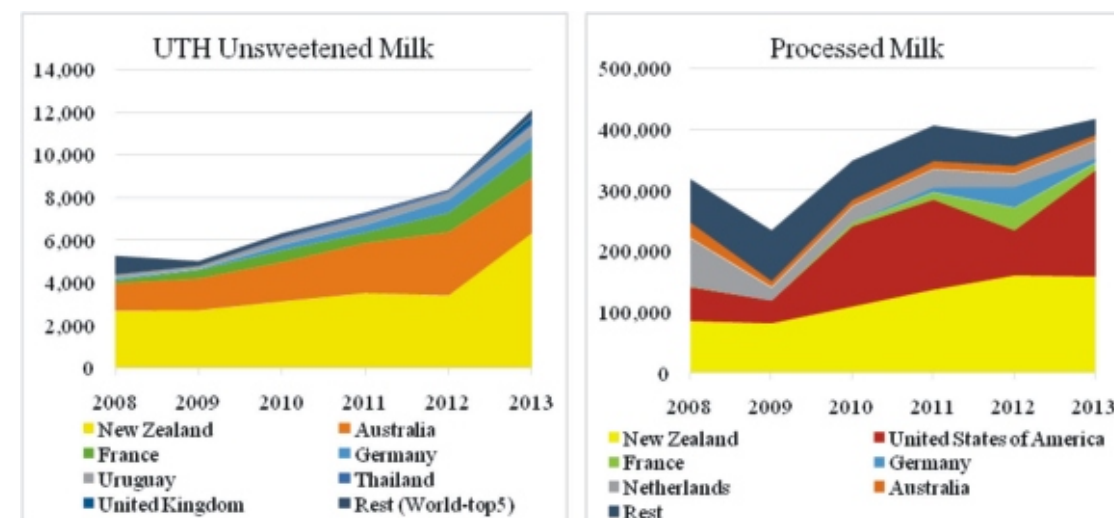
Source: ITC calculations based on UN COMTRADE statistics.

Milk and Dairy Products

New Zealand and Australia are the two largest trading partners of Viet Nam in import of unsweetened UHT milk. Import value increased steadily over the years in the period 2008-2012 and rose sharply in 2013, reaching 6.3 million USD from New Zealand and 2.6 million USD from Australia. The remaining 26% of the total import of UHT milk in 2013 is shared by France, Germany, Thailand, Uruguay and other countries.

For processed milk products (condensed milk or sweetened/flavored), New Zealand and the United States are the two largest exporting countries to Viet Nam. The majority of these products is milk powder to be used as ingredients for the processing industry in Viet Nam (to make reconstituted milk, milk beverages, etc.). Import from New Zealand increased steadily through the years, from 85.4 million USD in 2008 to 158.4 million USD in 2013. Import from the United States changed during the same period, and tend to increase, from 55 million USD in 2008 up to 174.4 million USD in 2013. In addition, Viet Nam also imports a small amount from France, Germany, Netherlands, Australia and other countries (mainly Europe and Canada).

Figure 3.12. Import of UTH Unsweetened Milk (HS0401) and Processed Milk (HS0402) to Viet Nam, 2008-2013 (thousand USD)

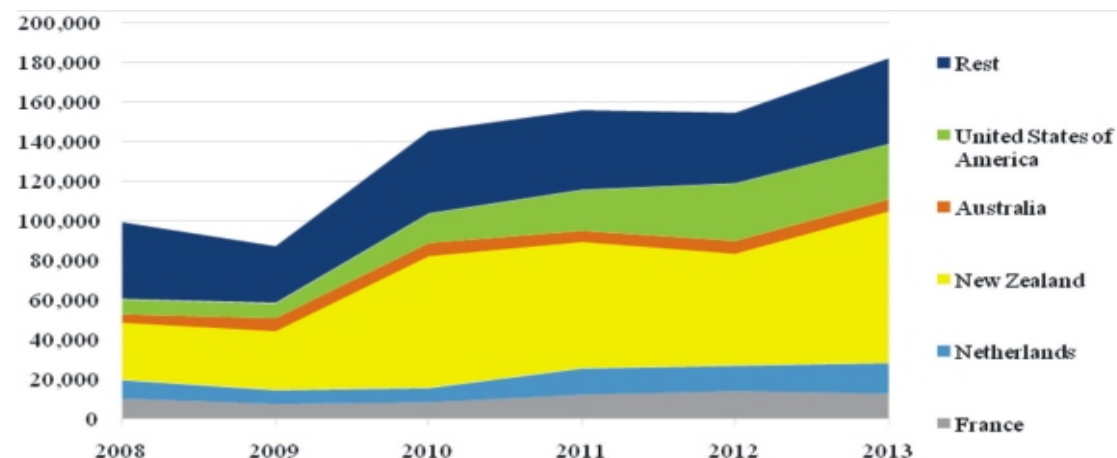


*Note: non-cumulative chart

Source: ITC calculations based on UN COMTRADE statistics.

New Zealand is the major exporter of dairy products to Viet Nam. Total import of these products in 2013 was 181.7 million USD, of which New Zealand is 76.7 million USD, accounting for 42.2%. Followed by the US (27.7 million USD), Netherlands (15.2 million USD), France (12.7 million USD) and other countries.

Figure 3.13. Imports of other Dairy Products (HS0403-6) to Viet Nam, 2008-2013
(thousand USD)



*Note: non-cumulative chart

Source: ITC calculations based on UN COMTRADE statistics.

Referring to the above data, we can see that Viet Nam imported a lot of livestock products from TPP countries, especially countries with the strong livestock sector as the US, Australia, New Zealand, Canada, and from AEC countries as Thailand.

Viet Nam's Tariffs for Livestock Products

Table 3.1 shows the average tariffs for imported livestock products in Viet Nam under the Most Favored Nation (MFN) status and some trade agreements: AFTA (with ASEAN), VJEPA (with Japan) and AANZFTA (with Australia and New Zealand). It can be seen that the import duties imposed on the products of AEC countries currently have been very low at 0-5%, while the MFN tariff and the tariffs applied to some TPP countries that have signed FTAs with Viet Nam such as Japan, Australia and New Zealand remain high, and is especially high for pork, beef, poultry and processed meat. For live animals, by-products and milk/dairy products, tariffs are already low.

Table 3.1. Applied Tariffs of Viet Nam on Imported Livestock Products in 2015 in some Implemented FTAs (%)

Products	MFN	AFTA	VJEPA	AANZFTA
Live bovine	Pure breeding	0		
	Other	5	0	2
Live swine	Pure breeding	0		
	Other	5	0	2
Live poultry	Pure breeding	0		
	Other	10	5	2

Products		MFN	AFTA	VJEPA	AANZFTA	
Bovine	Fresh/Chilled	Carcasses and half-carcasses	30	5	12	7
		With bone in	20	5	12.5	7
		Boneless	14	5	12.5	7
	Frozen	Carcasses and half-carcasses/With bone in	20	5	12.5	7
Boneless		14	5	12.5	7	
Swine	Fresh/Chilled	Carcasses and half-carcasses/With bone in	25	5	19	15
		Other				
	Frozen		15			
By-products	Bovine	8	5	7	7	
	Swine	8	5	7	7	
	Other cattle	10	5	4.5	5	
Poultry			40	5	12.5	
		Fresh/chilled/frozen	20	5	12.5	
	Poultry	not cut in pieces	20	5	12.5	
Processed meat	Swine	Others	10	5		7
		Livers	15	5	12.5	7
			20	5	12.5	7
Milk and cream	Bovine			15	5	12.5
	Chicken dice		3			
			5		4.5	
	not concentrated, unsweetened		10	5	7	7
		20	5		15	
Dairies	containers of 20kg or more	solid unsweetened	7	5		
		solid other	13	5	12.5	7
	Other	Unsweetened	10	5	4.5	5

Source: Viet Nam Customs

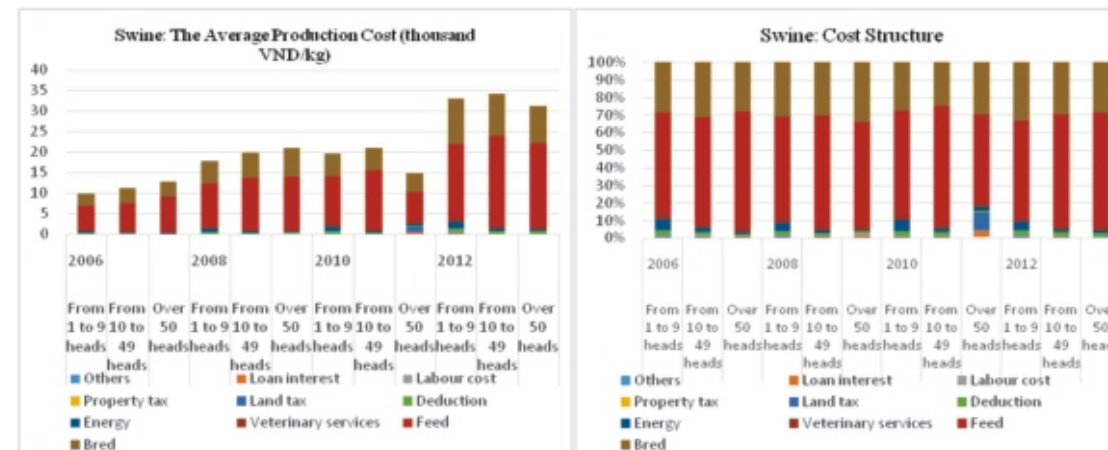
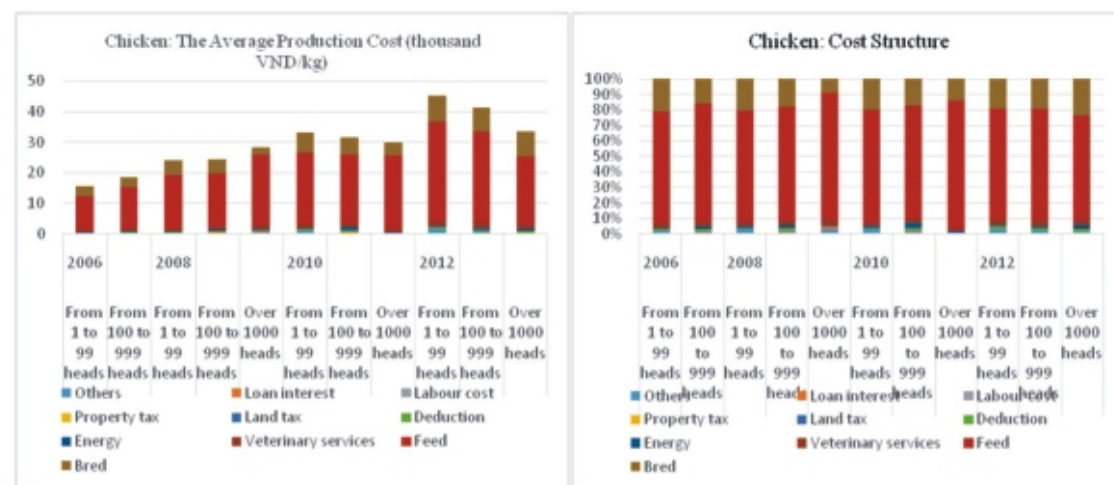
Hence after the removal of all tariff barriers by joining the TPP and the AEC, the industries currently protected by tariffs could be strongly affected. However, to evaluate the resistance ability of these sectors and the branches which are not protected but weak, we need to clarify the market structure along the supply chain of livestock products to have proactive preparation for effective integration.

MARKET STRUCTURE ALONG SUPPLY CHAIN

In order to evaluate the competitiveness of domestic livestock sector after joining the TPP and the AEC in particular and integration in general, it is necessary to assess the competitiveness in all markets with the competition of imported products: input markets (breeding animals, veterinary services, animal feed) and output markets (consumer products such as meat, eggs, milk and dairy products, by-products). However, due to constraints of time as well as the resources of the project, this study focuses on clarifying the output markets of 4 main products, which are milk, beef, pork and chicken. The characteristics of input markets structure have been clarified in the (SCAP, 2014).

To clarify the competitiveness of livestock products, compared to the taste factor and shopping habits, production cost is considered as the standard can easily be quantified and used to evaluate. The total production cost of main livestock products in Viet Nam in comparison with some main trading partners remains high. Since production costs are still relatively high in meat products, except the pork carcass, the domestic livestock sector will face risk of intense competition from overseas after all tariffs lifted by TPP and AEC (especially with high tariff items as beef, whole poultry meat - Table 3.1). In the situation that small livestock farms currently account for nearly 90% in Viet Nam, farmers need to reduce production cost by increasing production scale. The livestock sector also needs to enhance vertical integration (from inputs to retail products) as well as horizontal integration (between the units in the chain) to help lower costs by reducing the intermediation expenses.

Figure 3.14. The Average Production Cost per 1 kg of Chicken and Swine and Cost Structure by Farm size



Source: SCAP (2014) summarized from VHLSS 2006, 2008, 2010, 2012

Figure 3.15 and 3.17 illustrate the supply chains of two groups of livestock products: milk and meat (bovine, swine and chicken) consisting of Input, Production, Process/Slaughter, Distribution and Retail. Aiming at mapping the linkages between the chain participants both horizontally and vertically, Table 3.2, 3.3, and 3.4 summarize the market structure in main output markets, employing the desk studies and field trip results in a variety of cities/provinces standing for 3 regions (Ha Noi, Nghe An, Gia Lai, Lam Dong, Ho Chi Minh City) for sub-sectors of milk and bovine meat in line with incorporating SCAP (2014) for sub-sectors of swine and poultry. In details:

Milk: dairy cow market (input), raw milk market and (processing) consumer milk market (distribution and retail).

Meat: live animal market (for slaughtering) and meat market (distribution and retail).

Figure 3.15. Market Structure along Supply Chain

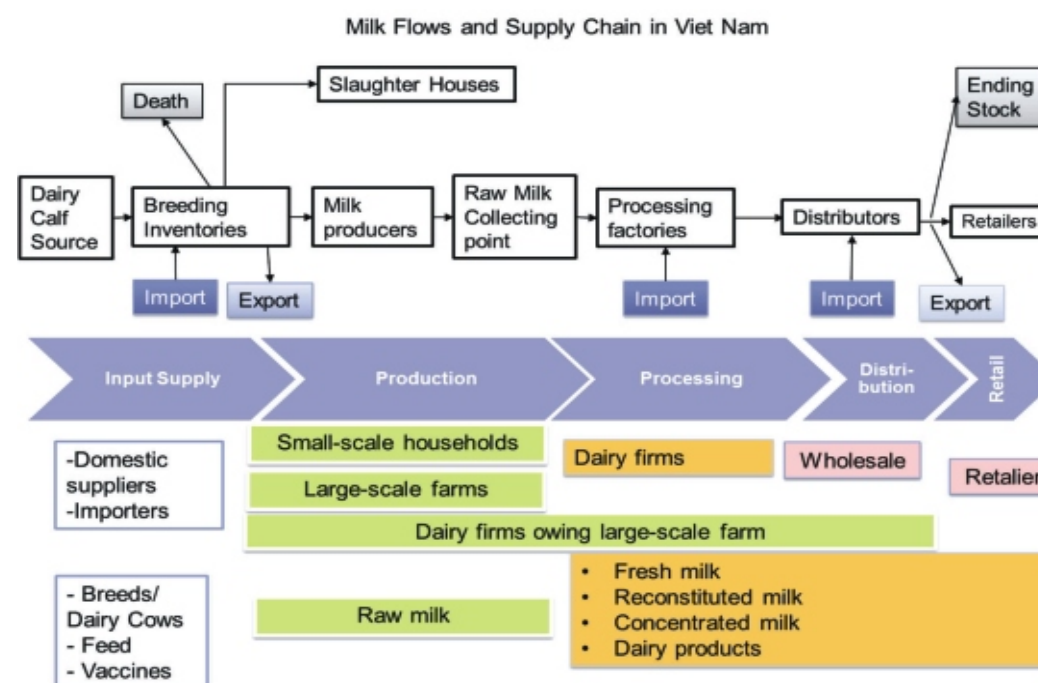


Table 3.2. Market Structure along Liquid Milk Supply Chain

No.	Participant	Role	Quantity	Position	Behavior
Breeding/raising milk cows and producing raw milk (Inputs and Production)					
1	Breeding Inventories	Import breeds, cross-breed and supply milk cows to household	A few	With households: sell cows	- Decreasing breed's price / increasing productivity to compete with imported purebred (ex. Cu Chi dairy cows)
2	Dairy firms	- Import breed for their own farms and their contracted household - Produce milk	A few	- With household: financial and technical support - Independent: TH True Milk	- Sell imported breeds to households - Produce raw milk in their own large-scale farms, reducing cost by the economy of scale
3	Households	Produce raw milk	Many	- Buy cows from either breeding inventories or firms - Self - supplying on feed and outsource a part	- Buy either cheap/low productivity cows OR expensive / high productivity cows - 80% independent in feed, 20% buy from feed mills through retailers
4	Large-scale farms (Independent)	Produce raw milk	Few	- Import cows directly from abroad - Self-supplying on feed and outsource a part - Supply milk to firms	- Buy expensive/high productivity cows - Strictly follow quality standards and contract with dairy firms (long-term contracts)
5	Collectives	- Increase size of order" cheaper price for inputs	A few	Between household and other participants	- Bargaining power: higher than households in buying inputs - Collect membership fee or earn the difference in prices

No.	Participant	Role	Quantity	Position	Behavior
6	Slaughter house	Buy bull from household/ dairy Firms / large-scale farm	Many	With household/ farms:	Buy bull at competitive price
7	Government	Policy on breeds		Management	- Inefficient policy on breeding - Support policy for households and high-technology dairy firms is unclear and difficult to access
From raw milk to final product (Collecting and Processing)					
1	Dairy firms	-Collect milk from households or their own farms - Buy Ingredients	A few	- With household: monopsony - With foreign exporters - With collectives: buy milk from collectives or introduce to households	- Raw milk collecting price influenced by Vinamilk, using automatically -renewable 1 - year contract, emphasizing loyalty - Choose between buying raw milk from household and buying ingredients from abroad at competitive price - Free market rules with collectives
2	Foreign exporters	Sell whole milk powder to dairy firms	Many	- With dairy firms	- Competitive price
3	Collectives	- Type 1: serve as Intermediaries, let households work directly with dairy firms - Type 2: collect milk and sell to dairy firms	A few	- Between household and other participants	- Bargaining power: higher than households in buying inputs and selling raw milk to dairy firms - Seeking for new buyers for households in case of market change

No.	Participant	Role	Quantity	Position	Behavior
4	Households	Supply raw milk	Many	Sell raw milk to dairy firms/collectives	- Strictly follow quality standards and contract with dairy firms
5	Government	Regulate on milk processing		Management	- Support policy for households and high-technology dairy firms is unclear and difficult to access
Post-production (Distribution and Retail)					
1	Dairy firms	Supply milk to wholesale/retailers/exporters	A few	Supply milk to wholesale/retailers/exporters	Due to the lack of transparency of current market in Viet Nam: - Dairy firm producing fresh/UHT milk: compete by focusing on quality, requiring improving market transparency and not investing too much on advertising to cut cost - Dairy firm producing reconstituted milk: compete by focusing on price, investing on advertising, packaging and PR to attract customers; not promoting market transparency
2	Retailers	Sell milk to consumers	Many	- Grassroots retailers: buy from wholesale - Big supermarkets: buy directly from dairy firms	- Competitive price - Choose between fresh milk (requiring investment on cooling system), UHT milk and reconstituted milk (not investing in cooling system). - For UHT milk: choose between domestic products and imported ones

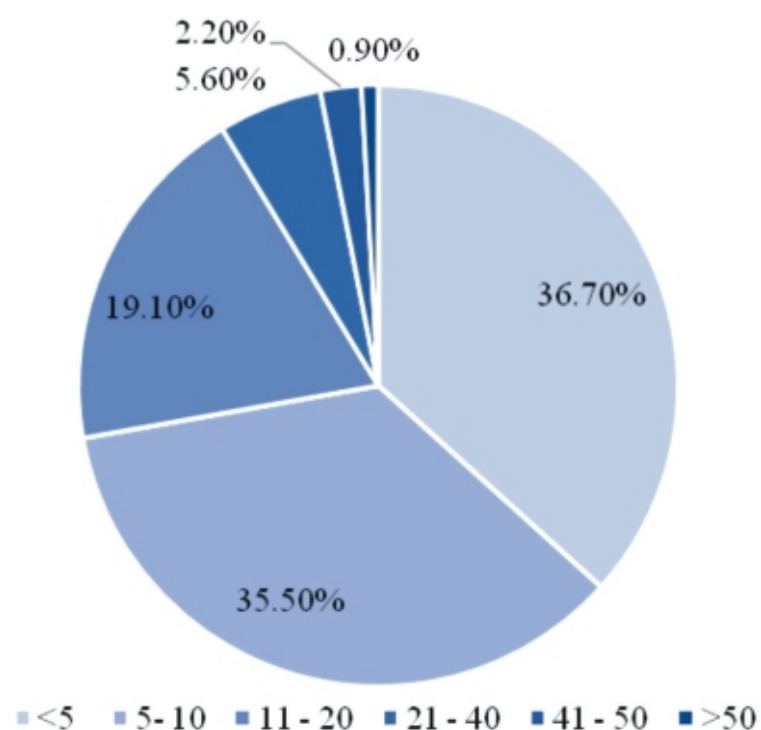
No.	Participant	Role	Quantity	Position	Behavior
3	Wholesaler	Sell milk to retailers	Many	- With dairy firms	- Competitive price
4	Importers	Import substitute Products	Many	- With big retailers /wholesaler	- Competitive price for all products - Cannot import fresh milk and difficult to compete in yoghurt market
5	Exporters	Export milk products	One (Vinamilk)	- With foreign importers	Export reconstitute milk to China and Laos
6	Consumers	Buy milk from retailers	Many	- With retailers	- Choose among different type of milk; powdered milk or liquid milk, among different types of liquid milk, between domestic products and imported ones - Based on preferences on price, quality, origins and taste
7	Government	Regulations on price and trade		Management	- Passive response and weak management for imported milk

The main participants in milk market are as follow:

Households: According to statistics of Department of Livestock (MARD), currently there are more than 19 thousand household of dairy cow husbandry, with an average of 3.3 cows/household, of which 12,626 household in the South (average 6.3 cows/household) and 7,013 households in the North (average 3.7 cows/household). Figure 3.16 presents the production scale of dairy household farms in Viet Nam in 2013.

Figure 3.16. Farm Size of Dairy Producing Household in Viet Nam 2013 (head/household)

Source: Nguyen Dang Vang (2014)



According to field trip results, households buy dairy cows from 2 main sources: (1) dairy firms for full-blooded (or purebred) Holstein Friesian (HF) cows at the price of 100-120 million VND with the milk yield of 3,600-4,300kg/lactation, (2) breeding inventories in Ba Vi, Moc Chau, Cu Chi at a lower price from 70-90 million VND for crossbred HF cows depending on the degree of breed purity (F1 50%HF cow producing 2,830-2,970kg/lactation, F2 75% HF cow 2,520-3,220kg/lactation and F3 7/8HF 2650-3250kg/lactation).

Households are relatively self-supplying on feeds (mainly forage) thanks to sufficient land size for small-scale husbandry. The rest 20% of feeds (starches and minerals) is supplied by retailer (direct contact) or wholesale agents (through collectives, at cheaper price in return for membership fee or profit share to collectives depending on different types).

Linkages between household and dairy firms: relatively weak and lack of bargaining power for household. The term of contract is short and will be extended automatically only in case of no trouble; there is neither financial nor technical support; loyalty is important (for instance, if a household leaves certain dairy firm to supply for another dairy firm due to price factor, he has no chance to re-sign a contract with former firm in the future); and household is constrained in terms of farm size and raw milk collecting price (varying by the milk quality with a high rate of deduction)

Large-scale Dairy Farm: Currently there are 2 types of large-scale dairy farms: (1) the ones belonging to the dairy firms such as TH True Milk¹, Vinamilk², Dalat Milk³; and (2) the

ones only in charge of husbandry and supplying raw milk to contracted dairy firms namely Hoang Anh Gia Lai⁴, Duc Long Gia Lai (under construction⁵).

With the advantage of high productivity (i.e. all above farms invest in HF cows with high degree of breed purity, resulting in high milk yield, e.g. 20-25 liters/day in HAGL or 30-40 liters/day in TH True Milk, and consistent milk quality) and economy of scale (hence low cost of input thanks to (i) wide feed ingredient planting area leading to independence on forage. (ii) Buy input directly from wholesale agents without intermediaries; lower production cost and transportation cost, etc. This is the modal of livestock husbandry that Viet Nam is heading for.

Regarding the linkages of these intensive farms and dairy firms: thanks to the limited number of large-scale farm and their close relations with dairy firms, their raw milk output is supplied to the dairy processing factories of the same corporation or long-term contracted ones. As a result, compared to household, these farms are not restricted in farm size and controlled in price but all deals are based on free market principles.

Dairy firms: There are 3 types of dairy firms: (1) the ones owning their own large-scale farms (thousands dairy cows) with closed production chain (TH True Milk); (2) the ones having no large-scale farm but outsourcing their production to household or private farms (Friesland Campina, Moc Chau, Ba Vi, Long Thanh), and (3) mixed of type 1 and 2 (Vinamilk, Dalat Milk in the process of transforming to type 1).

The number of domestic dairy firms is limited. The competition is most severe on liquid milk market⁶. In 2013, Vinamilk made up 48.7% liquid milk market, Friesland Campina 25.7%, TH True Milk 7.7% and 17.9% from the rest (Moc Chau, Ba Vi, Long Thanh, Dalat Milk, etc.).

It worth noticing that the raw milk supply from domestic production can satisfy on 28% of domestic demand for process production (both liquid milk and yoghurt) of Viet Nam in 2014. In the case of Vinamilk, the raw milk supplied by household accounts for only 27% of their input demand (Pham Le Duy Nhan, 2014). Therefore, most of products on liquid milk and yoghurt market of Viet Nam are reconstituted from milk powder (mainly whole milk powder WMP and skim milk powder SMP). However, the market information is not clear among pasteurized milk, UHT milk and reconstituted milk, leading to indifference in price of these

1. As of July 2015, TH True Milk has already completed 2 groups of farms in Nghia Dan, Nghe An with the size of 45,000 heads of dairy cows, towards the planned 203,000 heads separated into 4 groups of farms in 2020.

2. As of July 2015, Vinamilk has already established 7 large-scale farms in Tuyen Quang, Thanh Hoa, Nghe An, Ha Tinh, Binh Dinh, Lam Dong, Tay Ninh with the total population of 46,000 heads of dairy cows.

3. As of July 2015, Dalat Milk has only 1 farm with nearly 1,000 heads of dairy cows in Don Duong District, Lam Dong Province.

4. As of July 2015, HAGL already established a farm of 6,000 dairy cows in Dak Ya, Gia Lai Province, supplying to Nutifood an amount of 10 metric tons of raw milk per day.

5. Duc Long Gia Lao has announced their plans to construct a farm of 80,000 dairy cows in Dak Nong in cooperation with Vinamilk. However as observed during our field trip in April 2015, plus the dramatic fall of DLGL on stock market, authors assume that this project is unlikely to be realized in the near future.

6. The yoghurt market is currently dominated by Vinamilk (80%) thanks to their advantage of distribution system (Pham Le Duy Nhan, 2014); while the powdered milk market experiences the strong competition among Vinamilk (24.6%), Friesland Campina (15.8%) and foreign players such as Abbott (30%) and Mead Johnson (14.4%) (Euromonitor International 2014)

totally different kinds of milk. Therefore, when the price of milk powder drops, type 2 and 3 dairy firms will be better off and have the tendency to substitute the raw milk collected/produced domestically by imported milk powder¹ because the production cost is reduced intensively while the consumer price is unchanged².

Collectives: There are different types of collectives, of which 2 different models are observed in dairy sub-sector. In case of localized membership-fee-based collectives such as Collective Cau Sat, Tu Tra, Don Duong District, Lam Dong Province, participating households have to pay an annual fee of 5 million VND each. Collectives play the role of intermediary, supporting the signing of contract between households and buyers (dairy firms such as Dalat Milk, Vinamilk and Friesland Campina) or suppliers (breeding animals, veterinary services, animal feeds); assisting to seek for the dairy production promotion projects (providing technical training, financial support to buy equipment, facility building, etc.) and seeking for new buyers in case current buyers cut the collecting amount of raw milk. For example, after the M&A by TH True Milk, Dalat Milk is now transforming from collecting raw milk from household to in-house production with newly-established large-scale farm; therefore current Dalat Milk's suppliers need to find their new buyers otherwise they have to change to other production activities.

In case of collectives not only restricted to its geographical area such as Collective Tan Thong Hoi, Cu Chi District, Ho Chi Minh City, members do not have to pay the membership fee. The collective makes profits from the difference between the raw milk collecting price and the selling price to buyers (dairy firms like Long Thanh or process food firms). In this model, collective plays a role of an intermediary business, different from the traditional intermediary/collector in the sense that collective will sign a yearly contract with household and also provide technical support such as training, equipment, veterinary services in order to obtain the high quality milk.

Distributor-Retailers: The cooling system for pasteurized milk distribution and retail requires high investment hence under-developed, located mainly in big cities in Ha Noi and Ho Chi Minh. Therefore, the most popular kinds of liquid milk on the market currently are UHT milk and reconstituted milk. Due to the lack of market information when there is no distinguishing between pasteurized/UHT milk and reconstituted milk on packaging, it is an unfair competition between UHT milk and reconstituted milk produced domestically. Besides, on consumer market, domestic products also face the strong competition with UHT milk imported from New Zealand, Australia, etc.

Government: The government has issued policies supporting large-scale production using high technology as well as expanding dairy cow husbandry, as summarized in Livestock Sector Restructuring Scheme (page 76)

1. There are cases when the dairy firms encourages households to expand the farm size to increase the raw milk supply at first, then restrict the collection amount when the world price of milk powder fell dramatically from 4,541USD/metric ton (Oct 2013) to 1,702USD/metric ton (July 2015) for SMP and from 5,208USD/metric ton (Oct/2013) to 1,848USD/metric ton (July 2015) for WMP (<http://www.globaldairytrade.info>). It led to the strike of household farmers in 2014 by throwing milk. At such a low price of milk powder, the production cost of reconstituted milk is estimated to be 11,000VND/liter

2. (Pham Le Duy Nhan, 2014), while the collecting price at farm gate by Vinamilk was already 12,741VND/liter in 2013. Pham Le Duy Nhan (2014) pointed that the fluctuation in world price of milk powder and changes in the gross profit margin of Vinamilk are inversely correlated.

Figure 3.17. Bovine Meat Flows and Supply Chain in Viet Nam

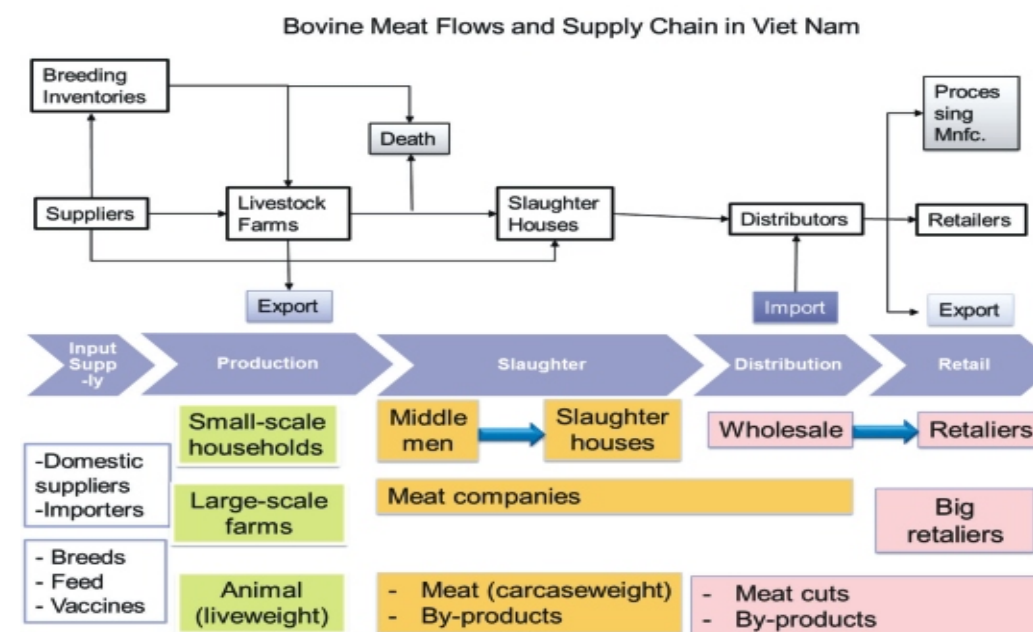


Table 3.3. Market Structure along Bovine Meat Supply Chain

No.	Participant	Role	Quantity	Position	Behavior
Live animal market					
1	Breeding inventories	- Import breeds and cross-breed to increase supply	A few	- With households	- Import from Thai/Laos (cheaper but lower productivity) or Australia/US (more expensive but high productivity) - Sell to households
2	Households	- Buy breed and raise animal	Many	- With breeding inventories - With grassroots slaughter houses	- Difficult to enter the market because of high requirements of raising technology
3	Large-scale farms	- Import breed directly or assigned by investors	Not many	- With Slaughterhouses	- Self-supplying for feeds to cut cost - Import live bovine (not through breeding inventories) to cut cost - Contracted with industrial slaughterhouses, not through intermediaries - Choose either only raising calf or also breeding by themselves for next herd generation

No.	Participant	Role	Quantity	Position	Behavior
4	Grassroots slaughter houses	- Buy live animal and sell carcass weight meat, OR - Supply slaughter service	Many	- With household / independent farms	- Work through intermediaries
5	Industrial slaughter houses	Slaughter	A few	- With large-scale farms	- Contracted with large-scale farms for long-time - Maybe or not work through intermediaries
6	Collectors	Buy live animal and sell without slaughtering	Many	- With households or farms	- Prefer low buying price (from farms) and high selling price (to slaughter houses) - Prefer households so they can have more bargaining power and less risk (short-time contract)
7	Government	Construct long-term planning		General	- Encourage large-scale farms and slaughter houses but policy implementation is slow
Meat market					
1	Grassroots slaughter houses	Sell meat to retailers	Many	- With grassroots retailers	- Short-term contract with floating price
2	Industrial slaughter houses	Sell meat to retailers	A few	- With retailers	- Long-term contract with less adjusted buying price
3	Wholesale	Buy meat from contracted inventories / slaughter house	A number	- With slaughter houses - With grassroots retailers	- Either short-term contract with grassroots slaughter houses or long-term contract with industrial slaughter houses
4	Big retailers (Supermarket)	Buy meat from industrial slaughter houses	A number	- With slaughter houses - With importers - With consumers	- Offer best price to consumers (but mostly a bit higher than grassroots retailers in return for higher cost in sanitary and costly distribution system) - Balance between fresh meat and chilled/frozen meat: + Fresh meat: Long-term

No.	Participant	Role	Quantity	Position	Behavior
4					contract with big slaughter houses + Chilled/frozen meat: long-term contract with importers
5	Grassroots retailers	Sell meat to consumers	Many	- With slaughter houses - With wholesale retailers	- Buy meat from wholesale or directly from slaughter houses - Compete with imported meat
6	Importers	Import meat	A number	With retailers	- Import chilled/frozen meat competing with fresh meat produced domestically - Mainly contract with supermarkets for cooling distribution system
7	Consumers	Buy meat from retailers	Many	With retailers	- Prefer cheaper products and convenient shopping place (currently grassroots retailers but gradually changing to comfortable and trustworthy supermarkets) - Habit changes gradually
8	Government	Policy on price		Management	

Main participants in live bovine and bovine meat markets:

Household: In 2006, summary from local reports shows that there were 3,404 household farms of beef cattle, of which 1,064 farms equivalent to 31.3% were in the North and 2,340 farms in the South, accounting for 68.7% total number. However, most bovine husbandry is conducted in small scale and scattered in households (Do Kim Tuyen, 2009). The farm size of 1-5 heads make up for 93.81% and the ratio of household farms having more than 10 heads is only 1.14% (Nguyen Dang Vang, 2014). The main barriers for Vietnamese farmers to enter this sub-sector are huge initial investment, high technical barriers and severe competition pressure (i.e. on price and quality with imported bovine). Moreover, the constraint of land and longer cycle of animals (due to longer life cycle of bovine cattle) discourage the incentive of household to raise bovine animals compared to swine and poultry husbandry (which has the capability of more intensive large-scale farm in the same land and the larger number of animal cycle per annual). These are the reasons explaining for the erosion of the total bovine population and the stagnation of total bovine domestic output.

Large-scale farms: The model of bovine large-scale farm is mainly to fatten live bovine

imported from Australia, e.g. Hoang Anh Gia Lai¹, Duc Long Gia Lai and a number of farms in Dong Nai or suburb of Ho Chi Minh City. Australian heifers weighted around 200-250kg/head are imported directly from Australian exporters to these farms and fatten to approximately 500kg/head in 6 months (average fatten rate is 1.5kg/day/head). The average imported price of live bovine from Australia is 3 USD/live-weight kg plus another 300USD/head for transportation cost. After fattening in Viet Nam, the price falls to around 2USD/live-weight kg, which is completely competitive at domestic market. The farms having huge land capital for feed ingredients planting like HAGL will be independent on feeds (completely self-supplying on forage and outsourcing part of starches and minerals). The large-scale farms without sufficient land can buy feeds at a cheaper price compared to households thanks to the discount for large purchases and direct contact with feed wholesalers instead of retailers. All intensive farms gave their own vegetarian teams and have to satisfy the strict requirement on animal rights imposed by exporting countries. Currently, after fattening stage, live bovine will be sold to private intensive slaughter houses (industrial or half-industrial). Contracts are made based on free market principle with price motivation.

Collectors: Currently, there are two types of collectors: (1) buying live bovine from domestic household and sell to slaughter houses and (2) importing live bovine directly from abroad through foreign exporters and sell to intensive/wholesale slaughter houses. Type 2 collectors are the main rival of large-scale farms doing fattening as described above. At the moment, live bovine cattle from Australia are imported at the main seaports in the South and North, with 4 big companies in charge in the southern region and 3 in the northern region.

Slaughter Houses: There are two types of slaughter houses: (1) intensive/large-scale ones (industrial, semi-industrial and concentrated) working directly with collectors (if bovine animals raised in household or imported from abroad) and large-scale farms (in case of fattened bovine); a limited number of which owns their distribution and retail system, taking example of VISSAN; while a bigger proportion will supply to supermarket or wholesale for further stages of supply chain; (2) small-scale ones supplying carcass for markets/local retailers.

Distributors - Retailers: Most bovine carcass from industrial/semi-industrial slaughter houses will go to supermarkets or wholesale, then distributed to markets and local retailers. Another flow of bovine carcass comes from small-scale household-level slaughter house to markets and local retailers.

After slaughtering, the consumer price of Australia at markets and supermarkets fluctuates from 300,000-500,000 VND/kg depending on type and age. This price is considered as reasonable as and not remarkably higher than domestic beef with a difference of only around 20,000 VND/kg. Therefore, for distributors-retailers, Australian beef and domestic beef can be substituted strongly to each other.

However, in the condition of large scale of raising and/or slaughtering Australian bovine, it

1. As of May/2015, there are nearly 60,000 bovine being raised at HAGL farms in Lao, Cambodia and Viet Nam (of which 22,000 heads in Gia Lai). HAGL planned to expand to total 100.000 heads later this year.

is necessary for establish a cooling/chilling distribution and retailing system because this type of meat cannot be consumed as fast as warm meat slaughtered in small quantity at scattered slaughter houses. As a result, Australian beef often goes to supermarkets or a limited number of retailers equipped with appropriate chilling system. For distributors and retailers satisfying this requirement, they will have another substitute product chilled or frozen bovine meat imported from abroad (Australia, the US, New Zealand)

Government: The government has issued policies supporting large-scale production using high technology as well as expanding dairy cow husbandry, as summarized in Livestock Sector Restructuring Scheme (page 76).

Table 3.4. Market Structure along Swine and Poultry Meat Supply Chain

No.	Participant	Role	Quantity	Position	Behavior
Live animal market					
1	Breeding inventories	- Import breeds and cross-breed to Increase Supply	A few	- With households	- Import from abroad and cross-breeding then sell to households/farms - Sell to households
2	Households	- Buy breed and raise animal	Many	- With breeding inventories - With investors /big firms	- Choose between being independent or becoming contractors for big firms/investors (CP, Japfam, Emivest) - Independent: free to choose feed/breed suppliers, but unstable buyers - Contractor: depend on investors in choice of inputs and no choice of buyer; lower price compared to independents but stable sale - Have to bear the environment cost
3	Large-scale farms	- Import breed directly or assigned by investors	Not many	- With investor: either close (owed by investor) or loose (outsourced by investor)	- Choose between being independent or becoming contractors for big firms/investors (CP, Japfam, Emivest) - Selling at competitive price compared to households thanks to scale of production

No.	Participant	Role	Quantity	Position	Behavior
4	Investors/ Big firms	Control the whole supply chain from breeding to production and retail	A few	- With household: monopoly in feeds and monopsony in live animal	- Strict control with households and leave the environment cost for households - Cooperate with chained retailers (i.e. supermarkets) at competitive price (due to environment cost cut) and long-time contract
5	Grassroots slaughter houses	- Buy live animal and sell carcass-weight meat, OR - Supply Slaughter service	Many	- With household / independent farms	- Work through intermediaries
6	Industrial slaughter houses	Slaughter	A few	- With large-scale farms	- Contracted with large-scale farms for long-time - Maybe or not work through intermediaries
7	Intermediaries	Buy live animal and sell without slaughtering	Many	- With households or farms	- Prefer low buying price (from farms) and high selling price (to slaughter houses) - Prefer households so they can have more bargaining power and less risk (short-time contract)
8	Government	Construct long-term planning		Management	- Encourage large-scale farms and slaughter houses but policy implementation is slow
9	Consumers	Buy directly from Households	Many	With household	- Prefer live animal (mainly poultry) and do slaughtering by themselves
Meat market					
1	Grassroots slaughter houses	Sell meat to retailers	Many	- With grassroots retailers	- Short-term contracts with floating price
2	Industrial slaughter houses	Sell meat to retailers	A few	- With retailers	- Long-term contracts with less adjusted buying price

No.	Participant	Role	Quantity	Position	Behavior
3	Wholesale	Buy meat from contracted inventories / slaughterhouse	A number	- With slaughter houses - With grassroots retailers	- Either short-term contract with grassroots slaughter houses or long-term contracts with industrial slaughter houses
4	Big retailers (Supermarket)	Buy meat from contracted wholesale retailer or industrial slaughterhouse	A number	- With wholesale retailers/slaughter houses - With consumers	- Offer best price to consumers (but mostly a bit higher than grassroots retailers in return for higher cost in sanitary and phytosanitary and costly distribution system) - Balance between fresh meat and chilled/frozen meat: + Fresh meat: Long-term contracts with big slaughter houses + Chilled/frozen meat: long-term contracts with importers
5	Grassroots retailers	Sell meat to consumers	Many	- With slaughter houses - With wholesale retailers	- Buy meat from wholesale or directly from slaughter houses - Compete with imported meat
6	Importers	Import meat	A number	With retailers	- Import chilled/frozen meat competing with fresh meat produced domestically - Mainly contract with supermarkets for cooling distribution system
7	Exporters	Export meat	A few	With wholesale	- Export mainly swine meat (comparative advantage of Viet Nam compared to Taiwan)
8	Government	Regulations on price		Management	- Ensure local farmers protection with high tariffs
9	Consumers	Buy meat from retailers	Many	With retailers	- Prefer cheaper products and convenient shopping place (currently grassroots retailers but gradually changing to comfortable and trustworthy supermarkets) - Habits change gradually

PREPARATION FOR INTEGRATION

Consumption Habits

Facing with the risk of strong influence by trade liberalization, especially intense competition with imported products from countries with strong livestock, such as the US, Australia, New Zealand, Canada in the domestic market, livestock sector should have measures to shore up in short and long term.

In short-term, the most positive factor is the Vietnamese consumption habits. First, the tradition of using fresh meat instead of frozen meat may help restrict the competition of imported frozen meat. However, live animals imports for fattening and slaughter are trending upwards; this is not a long-term support of the domestic livestock sector. Simultaneously, the strong rise of the middle class, especially in the urban areas in Viet Nam, with busy life, higher income and consumer awareness, particularly on the issue of food safety and origin, will also accelerate the process of adjusting their consumption habits towards chilled and frozen meat.

Second, consumer preferences for specialties that cannot be replaced by imported products help determine the competitive advantage of domestic livestock in some niche markets. However, there are two issues to be set out here: (1) consumption habits of young people are gradually changing, under the influence of fast food chains and foreign cuisine; (2) domestic livestock for specialty products is also in small scale and doesn't get much investment, then the output is generally not high. Thus, the attack on the niche market requires studies to proposed reality development plans, which not destabilize supply and demand, especially when demand is changing.

High technology costs for distribution systems, particularly for chilled or frozen products, affect to domestic livestock in two directions: (1) to obstruct the process of infiltrating market of imported frozen meat because small, street markets are more popular than super markets; (2) however, it make transportation costs of UHT milk and cleanliness dairy products higher, which reduces the competitiveness of dairy products using domestic raw milk compared to reconstituted milk, imported pasteurized milk, etc.

Livestock Sector Restructuring Scheme

Along with the international economic integration, the Government and the Ministry of Agriculture and Rural Development have made strategies and schemes to develop Viet Nam's livestock sector towards higher value and sustainable development. After joining the WTO, the Prime Minister approved the development strategy of livestock to 2020 in 2008. Then, from 2012 to date, the Master Plan of production development of agriculture and Restructuring scheme for agricultural sector were approved. On this basis, in May 2014, the Ministry of Agriculture and Rural Development approved the Scheme "Restructuring the livestock sector towards greater added value and sustainable development". This Scheme was launched with the aim of promoting the advantages of the capacity to produce some domestic animals in order to improve productivity, quality, competitiveness, added value and sustainable development in order to ensure social security, environmental protection.

The main content of the project revolves around four major focus, including: (i) restructuring the production of the livestock sector by region, gradually shifting livestock farms from high population density areas to low population density areas, forming key breeding areas, disease safety, far from the city and residential areas; (ii) restructuring domestic animal production in the direction of reducing the proportion of pork, increasing the proportion of poultry, beef and developing other potential animals; (iii) restructuring livestock production methods, shifting livestock farming from small-scale households to large-scale farms, identifying appropriate farm scale with each kind of livestock, each region or locality; developing livestock farmers towards industrial farming, with control, applying technical advances, biosafety, reducing environmental pollution; and (iv) restructuring the value chain, commodities and organizing to link product chain, from production to market, which emphasizes the role of enterprises in association with the organization of production.

The Scheme has also given some policy measures in the implementation of the restructuring on issues such as land, credit, taxation and trade. On land, the project offers solutions for reserving land to plan concentrated breeding areas, extend the time for land tax to farmers who make facilitate investment and/or build infrastructure for husbandry. Concurrently, there are tax incentives for feed material importers and VAT exemption for animal feeds products. On trade, the Scheme simplifies administrative procedures for organizations and individuals to consume domestic products and exports and to improve the standards and technical regulations of quality control and food safety with imported goods.

According to the Action Plan, there are six major tasks given in implementation of the scheme from 2014 until the end of 2020. In the first two years, we need to build, review the livestock development planning, specifically planning based on the livestock sector restructuring; to build safety models of animal diseases, to build the linked production model... The second task is to develop policies, legal documents and to improve institutions by the Department of Livestock in collaboration with relevant units under the Ministry. Third, improving productivity and quality of cattle, poultry breeds, and upgrading livestock breeding firms; importing new cattle, poultry breeds; building national management system of livestock breeds. Next is to study and apply science and technology, technological advances in livestock production, invest resources for scientific research in the field of animal husbandry; build models using alternative, supplementary feed and new feed for livestock animals... Two last tasks in the Action Plan include deploying the propaganda, training and veterinary work which is mainly implemented by Departments of Agriculture and Rural Development.

Awareness of Participants

Although the policy has made remarkable progress, lack of information on integration, especially at local levels, businesses and farmers before and even after the signing of trade agreements is still very popular. This results in a passive situation when faced with the challenges of integration. According to the investigation of the Hanoi Young Business Association, 80% of the surveyed enterprises were apathetic, not interested in integration.

Additionally, the University of Economics and Business, Viet Nam National University, Hanoi also conducted a survey of nearly 700 small and medium enterprises in five cities Hanoi, Hai Phong, Ho Chi Minh City, Da Nang, and Can Tho. The result showed that 60% of Vietnamese enterprises don't know anything about the basic content of the AEC. In addition, in fieldwork of our research group at Ha Noi, Nghe An, Gia Lai, Lam Dong and Ho Chi Minh City, the farmers are not interested in or do not have any information about TPP and AEC.

CHAPTER 4

THE IMPACTS OF TPP AND AEC ON VIET NAM'S LIVESTOCK SECTOR

LITERATURE REVIEW

Chapter 4 gives a brief summary of studies related to GE, PE models as well as combining both types of models in assessing the impacts of trade liberalization on the sector level. General equilibrium model, partial equilibrium model and the methodology used in previous studies, especially studies assessing the impacts on livestock, will also be provided in this section.

General Equilibrium Model

One of the weaknesses of global CGE models when assessing the impacts of integration on a specific sector in details is that CGE models tend not sufficient to capture the diverse results across the sub-sectors, of livestock in this case. However, there are some studies accepting this weakness to assess the impacts of trade liberalization on agriculture in general and livestock in particular.

The study carried out by Todsadee et al. (2012) showed that at sectoral level, the meat production expands more in both absolute and relative term in Australia (20.19 million USD or 6.59%), Chile (15.61 million USD, 9.90%), New Zealand (12.61 million USD, 3.81%), Canada (10.68 million USD, 4.09%) and the US (7.08 million USD, 3.85%). In contrast, Viet Nam, Japan and Malaysia will experience a decline in livestock output. The range of contraction is from 24.81% to 53.06% for Japan, 0.25% 3.6% for Malaysia and 0.01% 1.78% for Viet Nam depending on sub-sectors.

Burfisher et al. (2014) uses a static GTAP model and GTAP database version 8 in order to analyze the impacts of TPP on agriculture. The authors constructs two scenarios to simulate the development between 2014 and 2025 (the expected completion year of TPP implementation): (1) a baseline scenarios adopting the available prediction on GDP growth, capital and labor increase, demographic and dietary changes, together with the implementation of other prospective FTAs; and (2) TPP scenario: all the above changes, plus the removal of tariffs and quotas for all industries among TPP countries. The results show that compared to the baseline scenario, TPP helps increase the intra-TPP agricultural trade by 6% and the US accounts for largest part (33%) of agricultural export increase while Japan makes up the biggest share (70%) of agricultural import increase. Trade in rice, sugar and other meat observes the highest percentage changes; on the other hand, bovine meat, other foods and poultry meat will have the largest figures in absolute term. Trade expansion in meat account for 43% expansion in intra-TPP agricultural trade in 2025, with Australia, the US, Canada and New Zealand being the main suppliers. Japan will be the biggest meat importer. Output in almost all agricultural sectors of Viet Nam and Singapore will decline, while gains achieved most in Australia (meat), New Zealand (dairy) and Singapore (other agriculture).

Partial Equilibrium Model

To assess the impacts of the trade policy changes, partial equilibrium models are commonly used to analyze these impacts at sectoral level. In general, PE analysis offers several advantages compared to GE models. Even though a PE model cannot take into account inter-market linkages as a GE model does, it can be as disaggregated as we want, thus avoid the aggregation bias which are usually found in a GE model. In addition, the data requirements are typically smaller and only data at sectoral level are needed: trade flows, trade policy and elasticities, thus, PE model can use more updated data.

Another advantage of PE models is the availability and ease of use. Also, their simulation results are relatively understandable, since these models only use some basic equations to calculate the market equilibrium. However, this may be seen as weaknesses of PE models because these models do not include constraints on production factors. Table 4.1 below provides the main features of PE and GE models:

Table 4.1. Partial vs. General Equilibrium Models

	PE models	GE models
Capturing economy wide linkages		x
Consistency with budget constraints		x
Capturing disaggregated effects	x	
Capturing complicated policy mechanisms	x	
Use of timely data	x	
Capturing short and medium term effects	x	
Capture long term effects		x

Source: WITS Advanced Course Presentation (WB, 2008), cited from United Nations and World Trade Organization (2012)

Currently, there are many ready-made PE models, which users could choose according to their need. Several models are widely known such as SMART model; Global Simulation Analysis of Industry-level Trade Policy (GSIM); Tariff Reform Impact Simulation Tool (TRIST); and Agricultural Trade Policy Simulation Model (ATPSM).

SMART, for example, is typically used to evaluate the impacts of a tariff change that provides a more favorable treatment for only one trading partner. The GSIM model was developed and expanded from SMART aims to simulate globally, with changes in tariff policies of one or more countries simultaneously. Meanwhile, TRIST focuses on the analysis of the impacts on government revenues, especially for low-income countries. Also, unlike other PE models, TRIST also analyzes the impacts on actual revenues, not only tariff revenue but all taxes levied on trade such as VAT. Finally, ATPSM was developed by UNCTAD in the 1990s to assess the impacts of agricultural trade liberalization to developing

countries, particularly focusing on standard agricultural policies such as quotas or subsidies after quantified.

GSIM was developed by Francois and Hall (2003) in order to simulate the changes in welfare, output, commodity prices and the trade flows as a result of the trade liberalization. In GSIM model, trade policies are reflected directly through the tariff changes among countries. A change in tariff will lead to a change in trade flows, both origins and destinations of goods. To simulate this change, GSIM model requires data on bilateral trade matrices; initial bilateral tariffs matrix; scenarios of tariff changes; and information on elasticities (import demand elasticity, elasticity of export supply and elasticity of substitution). The model estimates the effects of trade liberalization in terms of changes in trade flows; output; and economic welfare comprising of producer surplus, consumer surplus and changes in tax revenues.

In recent years, many studies applied the GSIM model to evaluate the impact of participation in FTAs on industry level of some countries such as Wörz, Pindyuk, Holzner and Astrov (2007), Holzner (2008), Holzner and Ivanic (2012), Leudjou (2012) and Burkitbayeva and Kerr (2014),...

Wörz et al. (2007) used GSIM model to analyze the impact of the Russia's WTO accession in the medium and long run. Wörz et al. (2007) indicates that using a fully-fledge general equilibrium model (which would have to include a full endogenization of income and expenditure levels across the region) would be too ambitious, especially given the outdated input-output tables. In addition, in some other studies, Holzner also applied GSIM model to assess the EU accession of some countries such as Serbia the Balkans and Turkey on agricultural trade (Holzner, 2008; Holzner and Ivanic (2012).

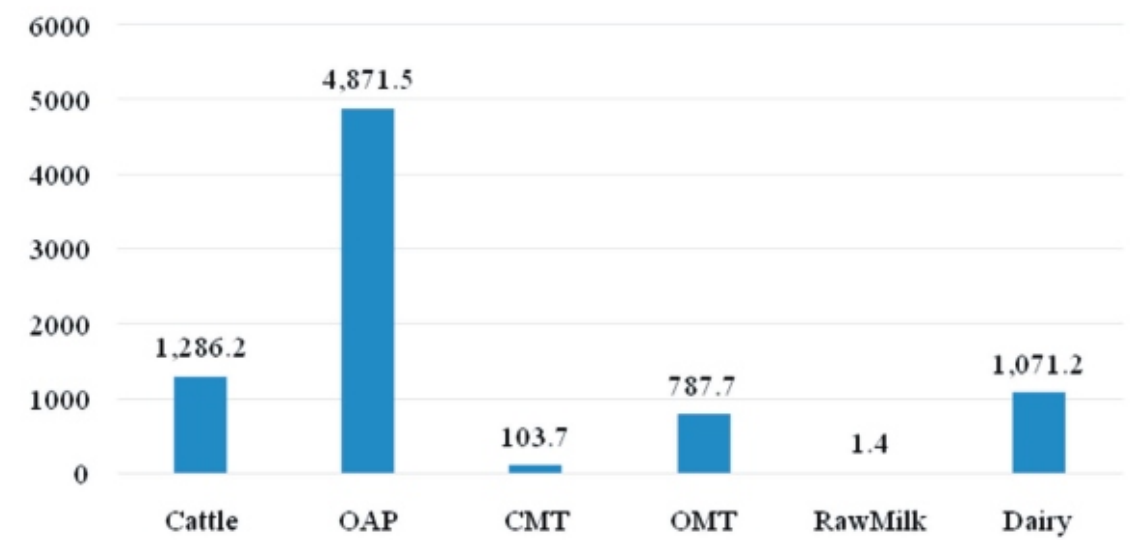
Burkitbayeva and Kerr (2014) analyzed the wheat export industry in the world when Kazakhstan, Russia and Ukraine, which accounted for about a quarter of wheat exports worldwide, accessed to the WTO. This study used the data with 2007 as the base year, a year before the official Ukraine's WTO accession. Also, the wheat market in 2007 was stable and without any major volatility before the global economic crisis which accompanied much volatility in world food prices in 2008. The results showed that the change to MFN tariffs led to KRU countries trading more with markets such as Turkey, the EU and China. Meanwhile, major traditional wheat exporters such as Australia, Canada, the EU, and the US did not seem to be negatively impacted significantly.

Using the GSIM model, Leudjou (2012) simulated multilateral tariff reduction scenarios for the Camaroon dairy sector under the framework of the Doha Round. This study assessed the impact of trade liberalization on food security in dairy sector, focused on the changes in domestic prices and consumer surplus. Moreover, the author used sensitive analysis by changing the parameters of elasticity to ensure that consumer surplus was basically insensitive to the values of elasticity. Accordingly, sensitivity analysis showed that consumer surplus maintained negative after liberalization.

GE/PE combined model

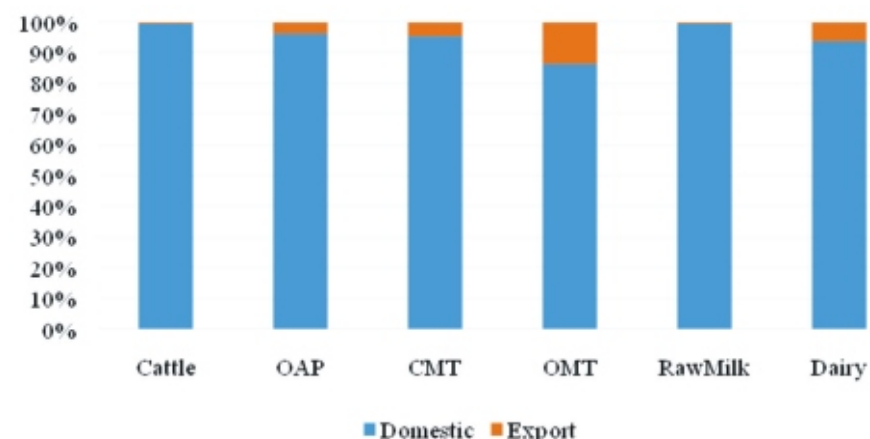
However, partial equilibrium (PE) models alone have limitations to predict the changes in

price and quality at the level of whole industry or economy, which interrelated with other sectors in the economy. Therefore, there have been a number of attempts by scholars trying



1. The most updated version of GTAP database has the base year of 2011, which is usually criticized as outdated and not incorporating the recent implemented trade agreements.

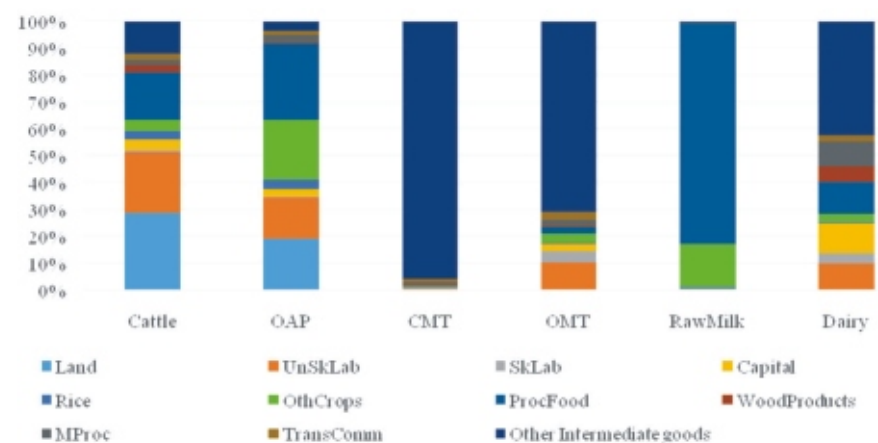
Figure 4.2. Output Disposition



Source: GTAP 9 Database

The following figure depicts the production cost structure of livestock sub-sectors in 2011. In the picture, almost all sub-sectors primarily paid for intermediate cost, especially CMT and RawMilk. The percentage of intermediate cost (the costs of using the products of other sectors as inputs) accounted for 80% to nearly 100% of total production cost. At lower place are the two sub-sectors Cattle and OAP. These two sub-sectors used quite a lot of capital and labor (mainly unskilled labor) in the production cost structure. Moreover, raising cattle, poultry... required land and big farm. Therefore, land was also the main input for these two sub-sectors, accounting for 20% to 30% of the production cost structure.

Figure 4.3. Cost Structure of Livestock Sectors



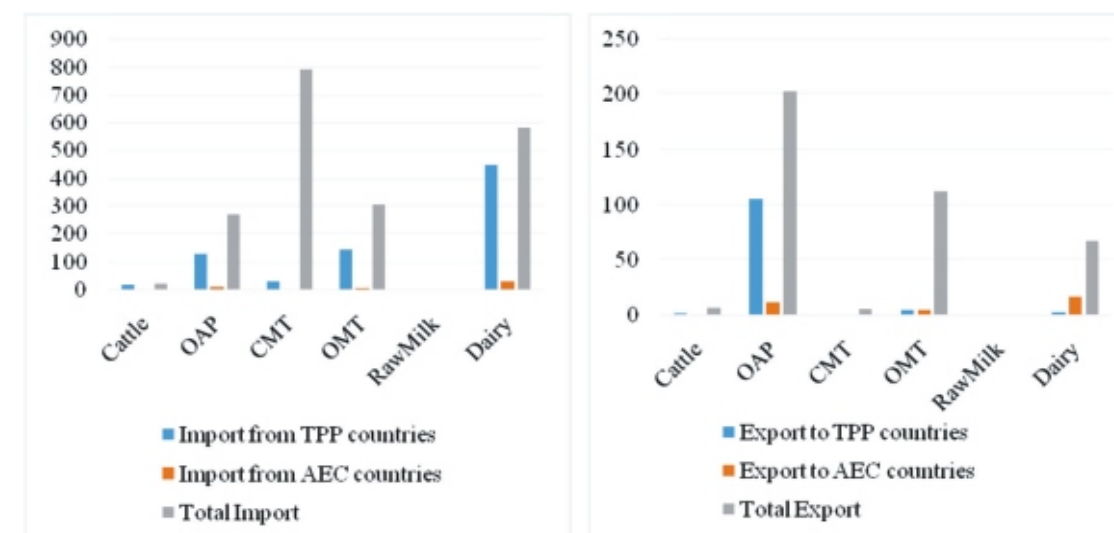
Source: Authors' calculation from GTAP Database version 9

Besides, some other intermediate products used in livestock production were processed food (Procfood), Rice, OthCrops and Transcomm.

In terms of trade, Figure 4.4 illustrates the trade in livestock products between Viet Nam and partners in the two blocs TPP and AEC in 2011. It can be noticed clearly that Viet Nam

exported and imported a relatively small amount of livestock products. Meanwhile, Viet Nam exported and imported more products from TPP countries than from AEC ones. Export value of livestock products with TPP members reached 870 million USD while that with AEC members was only 78 million USD. It should be noted that import duties Viet Nam applied to TPP countries during this period were higher than those of AEC countries, especially in two sub-sectors cattle meat products (CMT) and other meat products (OMT) (Table 2.1).

Figure 4.4. Trade in Livestock Products of Viet Nam in 2011 (million USD)



Source: GTAP 9 Database

The main products which TPP members exported into Viet Nam included animal products which were not cattle like pig, poultry, (OMT) and Dairy products. Dairy products imported from TPP countries reached 448 million USD, accounting for 59.1% of imported livestock products from TPP countries. Meanwhile, Viet Nam exclusively exported animal products except for cattle (OAP) to TPP countries and a part of dairy products to AEC countries.

Simulation Results of GTAP Model

Trade of Livestock Sector

Considering the livestock sub-sectors, these are the ones Viet Nam does not have comparative advantage as well as remain insignificant in exports (Table 2.1). Therefore, after TPP, exports of livestock sub-sectors cannot compete with comparatively advantaged countries namely Canada and the US (in OMT) or Australia (in CMT). Table 4.2 describes changes in Viet Nam's livestock trade value under different scenarios. According to TPP scenarios, the livestock export value of Viet Nam drops by an amount of about 50.6 to 54.9 million USD, accounting for only a small proportion of total exports of Viet Nam. Livestock exports of Viet Nam to ASEAN fall mainly in sub-sector of OMT (swine meat and poultry). It can be demonstrated clearly in the case where AEC takes effect, livestock exports into ASEAN countries drop mainly in pork, chicken (OMT). When assessing in terms of trade partners, exports fall sharply in non-TPP countries, especially in China (Appendix 7a, 7c).

Table 4.2. Changes in Livestock Trade by Scenario (mil. USD)

	Export						Import					
	a	b	c	d	e	f	a	b	c	d	e	f
Cattle	-0.9	-1.0	-1.1	-0.5	-0.6	-1.3	2.2	2.4	2.7	0.9	1.0	2.9
OAP	-12.8	-11.6	-11.8	-6.1	-6.8	-14.8	14.5	16.0	19.7	6.1	7.1	22.1
CMT	-0.1	-0.1	-0.1	0.0	0.0	-0.1	-35.4	-36.4	-38.8	-8.8	-9.6	-41.5
OMT	-30.8	-32.3	-34.0	-11.5	-12.7	-37.4	140.9	143.5	149.7	13.5	15.2	156.3
RawMilk	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dairy	-6.0	-7.0	-7.9	-3.1	-3.7	-7.1	100.5	105.4	114.7	19.3	22.3	118.7
Total	-50.6	-51.9	-54.9	-21.3	-23.8	-60.7	222.7	230.9	248.1	31.0	36.1	258.5

Source: Authors' simulations

In terms of import, total livestock imports will have large rise after TPP and/or AEC takes effect. Except for the sub-sector CMT, the rest will increase significantly, especially in two sub-sectors OMT and Dairy. With OMT, Viet Nam will increase import from the US (182.7 million USD, scenario b) and Canada (29.7 million USD, scenario b); and reduce importing from non-TPP countries (Appendix 7b, 7d). Similarly, Imported dairy products are mainly from countries which have an advantage in producing this kind of products like New Zealand and the US. A striking thing is that meat products from cattle like cow, buffalo tend to decrease after TPP and/or AEC takes effect. It can be explained by the fact that Viet Nam imports CMT products mainly from India which is not in TPP bloc. Therefore, after TPP/AEC takes effect, instead of importing from India, Viet Nam will increase imports from TPP/AEC members. However, the increase in imports from these countries can not make up for the decline in imports from India, leading to a slump in total import value of CMT products. According to scenario b, imports CMT products from TPP countries in scenario b will climb by 30.8 million USD. Meanwhile, the imports from non-TPP members drops sharply (by 69.6 million USD), mainly from India (decrease by 65.2 million USD) (Appendix 7b).

Sub-sectoral Output

Impact of TPP and AEC on outputs of livestock sub-sectors are mixed in direction of changes, but in general not significant as compared to other sectors. Among the livestock sub-sectors, the largest positive impact is observed in other animal products (OAP) under scenario c, 150 million USD increase, followed by cattle products (57 million USD) (Table 2.3). On the other hand, negative impact on other meat products (OMT) is observed clearly under the TPP scenarios in both percent and absolute changes. Dairy and raw milk result in similar negative percent change, but the former decreased by about 70 million USD whereas the latter shows insignificant change in US dollar. This is because the level of production of raw milk is very small to begin with.

Changes in livestock outputs can be decomposed into liberalization components of TPP and AEC, such as import tariff removals and reduction in non-tariff barriers.

Table 4.3 and 4.4 report the decomposition results of the total impacts of TPP and AEC on livestock outputs. Tariff reduction by Viet Nam to livestock products has created negative impacts on total outputs of this sector, mainly due to the tougher competition of imported products. Overall, reducing tariff in livestock sector in other countries as well as reducing tariff in other sectors and non-tariff makes positive impacts on Vietnam's livestock outputs. However, stiff competition because of the influx of foreign products after removing livestock tariff of Viet Nam has made total outputs of this sector drop swiftly.

Table 4.3. Decomposition of Livestock Outputs (scenario b, million USD)

	Total	Decomposition by Liberalization Components			
		Livestock tariff cut in Viet Nam	Livestock tariff cut by others	Non-livestock tariff cut	Reduction in NTB
Cattle	48.20	-4.99	3.22	45.98	3.99
OAP	119.87	-45.12	-2.08	149.71	17.35
CMT	-2.41	0.08	-0.01	-2.42	-0.06
OMT	-181.20	-106.06	-4.93	-67.32	-2.90
RawMilk	-0.10	-0.05	0.03	-0.08	0.00
Dairy	-73.57	-41.51	25.51	-55.80	-1.77
Total	-89.22	-197.64	21.74	70.07	16.61

Source: Authors' simulations

Taking scenario b as an example, Other animal products (OAP) gain by 119.87 million USD, of which non-livestock tariff cut contributes most by 149.71 million USD, followed by reduction in non-tariff barriers (17.35 million USD). Recall the import tariff rates in Table 5, imports of OAP to Viet Nam are virtually free trade, i.e. mere 0.7 percent tariffs. Because of this low tariff, OAP's negative impact of livestock tariff cut in Viet Nam is not large (negative 45.12 million USD) as compared to OMT. Among the livestock sub-sectors in Viet Nam, other meat product (OMT) is protected by relatively high import tariff rates. Once the tariffs are removed by TPP and AEC, substitution for cheaper imports of OMT reduces the demand for domestically produced OMT, and this effect is captured as negative 106.06 million USD. These results also show that in Viet Nam OAP, OMT and Dairy are the most, among livestock sub-sectors, affected by tariff cut in non-livestock sectors albeit in opposite directions. This implies a higher degree of linkages with non-livestock sectors by these three compared to other sub-sectors.

Table 4.4. Decomposition of Livestock Outputs (scenario e, million USD)

	Total	Decomposition by Liberalization Components			
		Livestock tariff cut in Viet Nam	Livestock tariff cut by others	Non-livestock tariff cut	Reduction in NTB
Cattle	5.48	-0.41	0.20	3.22	2.47
OAP	19.21	-1.01	0.94	10.38	8.91
CMT	-1.19	0.00	0.09	-1.23	-0.05
OMT	-29.61	-1.69	0.02	-25.72	-2.23
RawMilk	-0.03	0.00	0.00	-0.02	0.00
Dairy	-18.11	-3.79	1.37	-14.91	-0.78
Total	-24.24	-6.90	2.63	-28.28	8.32

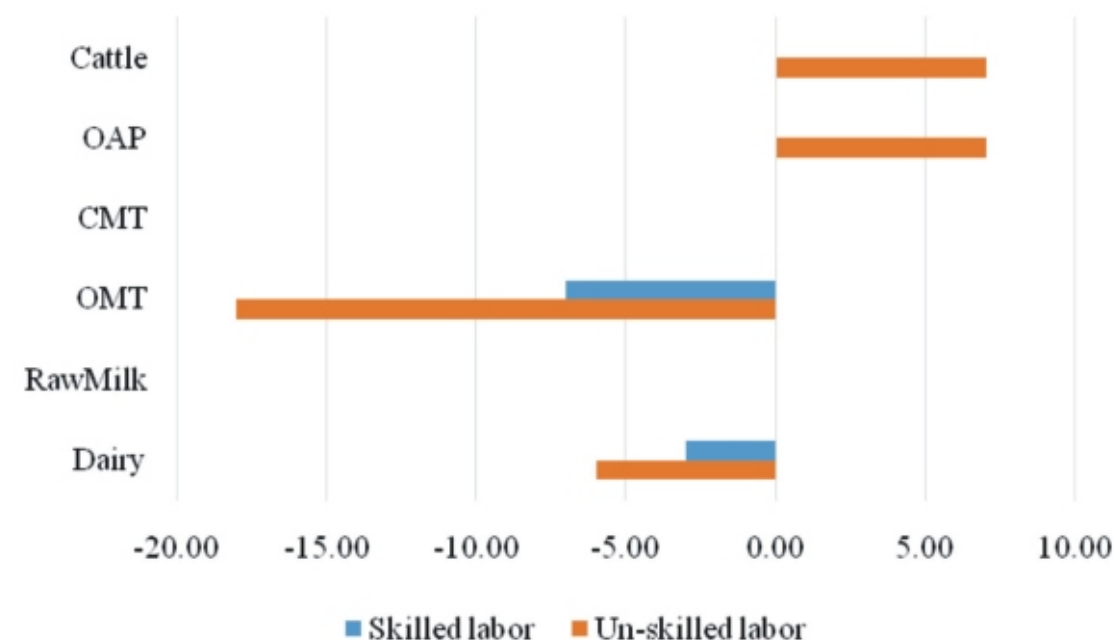
Source: Authors' simulations

Output changes in livestock sectors due to the non-livestock tariff cuts of TPP countries are reported in percentage term. Cattle and OAP expand production while other livestock sectors are contracted. This contrast can be explained by the decomposition of output change by markets: domestic sales or foreign sales (exports). Cattle and OAP increase domestic sales, and other sectors experience fall in sales in both domestic and foreign markets. Further, we can decompose the change in domestic sales by economic agents; producers, private household, and government. Increases in domestic sales of Cattle and OAP can be explained by the rise of private household consumption demand, thanks to the increase in factor income. Demand increases while these two sub-sectors have self-sufficiency of up to 98% to 99%, requiring is proportional increase in domestic production. This leads to the increasing demand for importing intermediate materials from other sectors. Negative domestic sales of CMT, OMT, and Dairy (excluding RawMilk due to near zero level of production) are caused by the falls in firm's demands for these sub-sectors' products as intermediate inputs to production, mainly attributed to substitution for imported inputs for falling prices.

Labor Demand

In terms of production cost structure, labor in livestock sector is mainly unskilled labor. Therefore, after TPP/AEC takes effect, skilled labor demand will witness a small change while the change in unskilled labor demand is clearer. The result of the simulations shows that labor demand (including skilled and unskilled labor) drops in OMT and Dairy, drops slightly in RawMilk and CMT and rises slightly in the remaining sub-sectors (Table 2.14 and 2.15).

Figure 4.5. Changes in labor demand (scenario b, million USD)



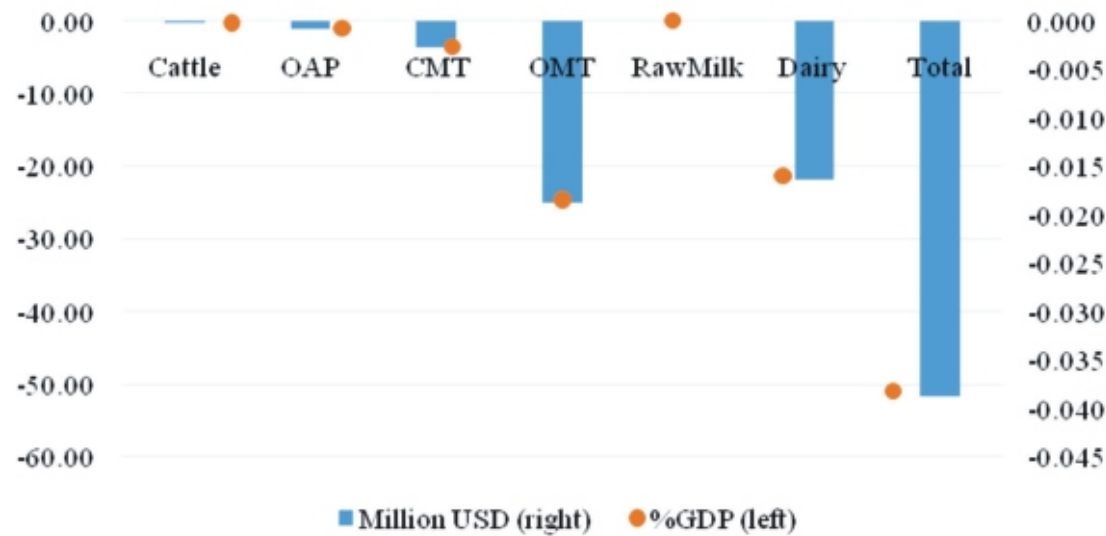
Source: Authors' simulations

Figure 4.5 describe changes in the labor demand of livestock sub-sectors according to scenario b. Labor demand falls by 21.42 million USD, mainly in OMT by 18.23 million USD of unskilled labor and 7.49 million USD of skilled labor. In terms of percentage changes, this sub-sector has the largest decrease, of about 22% to 25% in both unskilled labor and skilled labor after TPP takes effect (Table 2.14 and 2.15). This requires the appropriate policy responses to alleviate negative impacts on OMT's unskilled labor, if livestock is one of the important sectors. Meanwhile, unskilled labor demand grows to 6.74 million USD in OAP and Cattle, accounting for 0.6% to 3% of total unskilled labor value used in this subsector.

Tariff Revenue Reduction

Among imports of Viet Nam in six livestock sectors, OMT is the one bearing the highest tariffs imposed by Viet Nam, with the average of 17.3% for exports from TPP countries and 7.7% for AEC members. Meanwhile, Dairy imports from TPP and AEC has the largest value (Table 2.1). When both TPP and AEC take effect according to scenario f, tariff revenue in these two sub-sectors witnesses the most significant decline. The picture shows the decrease in tariff revenue of livestock's sub-sectors calculated in GDP's value and percentage. Tariff revenue of livestock sector will decrease by 51.6 million USD, equivalent to 0.038% GDP. In which, total declines of OMT and Dairy reach 46.61 million USD, equivalent to 0.034% GDP.

Figure 4.6. Tariff Revenue Reduction in Viet Nam for Scenario f



Source: Authors' simulations

The result of GTAP shown that, in consideration of the livestock sector, the results reveal that in both free trade blocs, output will decline in almost all livestock sub-sectors, except for other animal products (mainly live swine and poultry). In particular, the output of other meat (swine meat, poultry meat, offal and fat) will fall most remarkably in terms of absolute value and percentage change. Going the same contracting direction of livestock production, livestock exports also decline in both cases of TPP and AEC. In detail, the decrease concentrates in OMT, which includes swine meat the potential exporting sector of Viet Nam. Moreover, the declining output also leads to a drop in the labor demand (both skilled and unskilled) in the livestock sector.

ANALYZING THE IMPACTS ON VIET NAM'S LIVESTOCK SECTOR USING GSIM MODEL

The GSIM Model

Model Structure

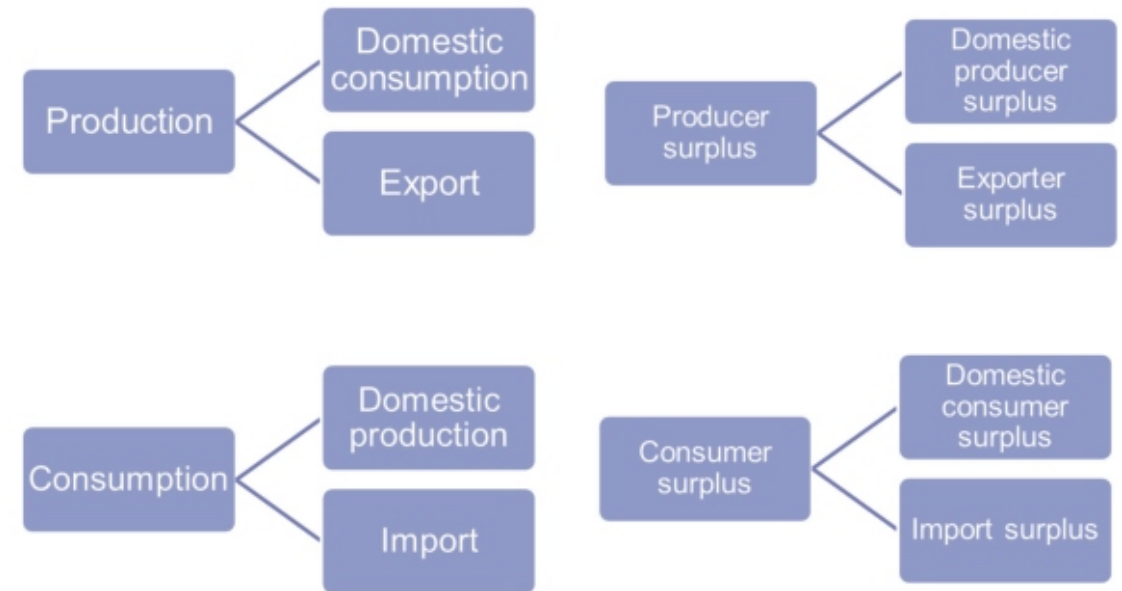
The GSIM model was introduced and developed by Francois and Hall (2003) for the analysis of global, regional or unilateral trade policy changes. Accordingly, GSIM is a partial equilibrium model with the basic assumption of national product differentiation, in which imports across countries are imperfect substitutes. The elasticity of substitution is assumed to be equal and constant across products from different sources. The elasticity of demand in aggregate import and elasticity of export supply are also constant in initial GSIM model (Francois & Hall, 2003).

The GSIM model allows us to assess the impact of changes in import tariff/export subsidies into changes in trade flows, welfare, prices and output. This model is built on the Excel platform, where the Excel Solver tool is used to solve core equations for the global

market clearing condition.

In initial GSIM model, the required inputs are bilateral trade matrix; initial bilateral tariffs matrix and scenarios of tariff changes; elasticity of substitution; elasticity of demand in aggregate import and elasticity of export supply. Changes in welfare are measured by the total surplus of the importer, exporter's surplus and tax revenue changes. In this version, Francois and Hall (2003) mentioned the inclusion of data on trade with self (domestic absorption) on the diagonal of the bilateral trade matrix. It is noticed that the domestic production and consumption can be classified as shown in the below figure:

Figure 4.7. Distribution of Production and Consumption



Source: Authors'

Therefore, as we have sufficient data on domestic absorption, the changes in producer surplus could include surplus of domestic firms and exporters. Similarly, consumer surplus not only includes importer surplus but also welfare of the consumer who consume domestic products.

Parameters and Data

To compensate for limitations of CGE models in outdated data usage without disaggregation of livestock sector to desirable level, we use GSIM model for 9 livestock sub-sectors including: (1) live bovine; (2) live swine; (3) live poultry; (4) bovine meat; (5) swine meat; (6) poultry meat; (7) raw milk; (8) milk powder; and (9) other dairy products.

Bilateral trade

Bilateral trade data classified by HS 6-digit code were collected from UN Comtrade Database in 2013 as the base year. Data of commodities which Viet Nam has trade relation with TPP or AEC countries, will be aggregated into 9 livestock sub-sectors. Domestic

absorption is included as trade with self, which are calculated from PSDO¹ database. However, due to statistical limitations of some countries in TPP as well as some Southeast Asian countries, domestic absorption data are only estimated for the sub-sectors (4), (5) and (6). In those cases, we are able to evaluate more accurately the impact of trade liberalization on domestic producers and consumers of Viet Nam, not only on exporters and importers.

As this study focuses on simulating the impact of trade liberalization on Viet Nam, only items in which Viet Nam has traded in the base year were included. Commodities which Viet Nam did not trade with TPP and/or AEC countries, are not considered.

Tariff and Equivalent of non-tariff barrier

Besides tariffs, this study also considers the influence of the reduction in Ad Valorem Equivalents of Non-Tariff measures. Information on applied tariffs classified by HS 6-digit code had been taken from Market Access Map database of the International Trade Center (UNCTAD/WTO). The average tariffs were calculated for 9 sub-sectors based on the applied tariffs and the import value of each sub-sectors component.

Meanwhile, the Ad Valorem Equivalents were extracted from Looi Kee, Nicita, and Olarreaga (2009), which estimated trade restrictiveness indices. This research shows that the tariff equivalents range from 0% to 2.5% in all considered countries, yet this figure could not be applied to not include Viet Nam and some AEC countries due to the lack of appropriate data. Thus, in order to make use of this information into the model, we assume that the tariff equivalent of Viet Nam is of the group with highest non-tariff barrier of which tariff equivalent data would be applied to Viet Nam and other missing data countries.

Elasticity of substitution, elasticity of export supply, import demand elasticity

Regarding the elasticity of substitution, the default value of 5 was adopted for all countries and commodities in this model (Francois & Hall, 2003). However, to ensure that the impact of tariff removal on welfare is not sensitive to changes in elasticity, this study uses the sensitivity analysis with the value of elasticity of substitution of 7.5 as well.

Aggregate import demand elasticities are applied using the default value of GSIM model, negative 1.25 (J. Francois & Hall, 2003). Similarly, the value 1.5 was adopted for elasticities of export of all countries and all sub-sectors.

Simulation Scenarios

With the data of tariffs and equivalent of NTBs as described above, this simulation by GSIM model employs similar scenarios as in the simulation by GTAP model, consisting of the followings:

- a. Tariff removal for the TPP partner countries,
- b. Scenario a + 7% reduction in non-tariff barriers (NTBs) for the TPP partner countries
- c. Scenario a + 7% reduction in NTBs for all countries/regions

- d. Tariff removal for the ACE partner countries
- e. Scenario d + 7% reduction in NTBs for all AEC partner countries
- f. Tariff removal for TPP and AEC countries + 7% reduction in NTBs for all countries/regions

Simulation Results of GSIM Model

The GSIM model allows us to complement the results obtained from the GTAP model and also to break the livestock sector down into smaller sub-sectors and thus have a more detailed picture of the impacts of TPP and AEC.

Welfare of Livestock Sector

Change in welfare by country

Simulation results show that, while the TPP affects most of the participants (scenario a, b, c and f), AEC has no obvious influence to the participating countries (scenario d, e). It should be noted that welfare measure used in GSIM model is based on economic agent's surplus, unlike the equivalent valuation in GTAP model.

It also should be remarked that the tariff equivalents of NTBs only range from 0% to 2.5% in all considered countries. Thus, we can see that the impacts of non-tariffs barriers are not clear in all scenarios (scenario b, c, e and f).

Table 4.5. Change in Total Welfare of Livestock Sector (million USD)

	Scenario					
	a	b	c	d	e	f
Australia	267.9	268.8	268.8	0.0	0.0	268.8
Brunei	-2.1	-2.1	-2.1	0.0	-0.1	-2.1
Canada	219.1	219.1	219.1	0.1	0.1	219.1
Chile	5.4	5.4	5.4	0.0	0.0	5.4
Japan	315.6	314.8	314.8	0.0	0.0	314.8
Malaysia	-45.5	-45.7	-45.7	-0.1	0.0	-45.8
Mexico	211.1	210.3	210.3	0.1	0.1	210.4
New Zealand	219.5	220.6	220.6	-0.3	-0.3	220.3
Peru	-10.9	-11.0	-11.0	0.0	0.0	-11.0
Singapore	-130.4	-130.6	-130.6	-0.2	-0.2	-130.9
US	318.1	318.3	318.3	-0.1	-0.1	318.2
Viet Nam	-31.1	-31.2	-31.2	-0.2	-0.2	-31.3
Cambodia	-0.4	-0.4	-0.4	-0.1	-0.1	-0.5
Indonesia	-76.5	-76.9	-76.8	0.1	0.1	-76.7
Thailand	-57.3	-57.2	-57.0	0.7	0.8	-56.3

Nguồn: Tính toán của nhóm tác giả

1. Production, Supply and Distribution Online (United States Department of Agriculture, Foreign Agricultural Service)

In the case where TPP was signed, the total welfare of the livestock sector in some countries, which have comparative advantages such as Australia, New Zealand and the US, would increase significantly. This is mainly due to the gains of exporters, with TPP is a potential market because the tariffs applied by all countries are now still very high. Conversely, other countries such as Japan, Mexico or Canada will gain large surplus of consumers/exporters, thus, increase their total welfare in livestock sector. It is mainly because these countries are now applying very high tariffs on livestock products.

Table 4.6. Welfare Decomposition (scenario b, million USD)

	Producer surplus	Consumer surplus	Tariff revenue	Net welfare effect
	X	Y	Z	W=X+Y+Z
Australia	374.77	-105.44	-0.55	268.78
Brunei	0.00	-2.12	-0.01	-2.13
Canada	114.63	744.49	-640.04	219.08
Chile	90.87	-62.36	-23.08	5.43
Japan	-714.49	4125.02	-3095.76	314.77
Malaysia	5.78	-48.00	-3.44	-45.66
Mexico	-392.04	2171.49	-1569.16	210.29
New Zealand	258.17	-31.91	-5.68	220.58
Peru	-1.53	-6.65	-2.80	-10.97
Singapore	12.36	-141.74	-1.24	-130.63
US	1575.43	-1036.73	-220.42	318.27
Viet Nam	-14.54	19.07	-35.70	-31.17
Cambodia	0.00	-0.39	-0.06	-0.45
Indonesia	0.37	-75.80	-1.44	-76.87
Thailand	0.62	-45.30	-12.55	-57.23

Source: Authors' simulations

After TPP, if all tariffs were removed, Canada, Japan and Mexico would be the three countries losing the largest tax revenue. Meanwhile, the US has the largest losses in consumer surplus after TPP. Several other countries also have negative surplus but in lower levels. It is due to the shift of the destinations of trade flows (as a result of TPP) from the US to other countries which have higher tariff rates before TPP. In other words, after TPP, many countries such as Japan or Mexico have to eliminate tariffs and non-tariff barriers, thus, these countries become more attractive markets. Commodities will be exported to these markets rather than the US. It is obvious that except for Canada and Peru, the impacts of TPP to

welfare of producers/exporters and consumers/importers in all countries are opposite.

For scenarios only for AEC (scenario d and e), the simulation results show that there is no clear impact on Viet Nam's livestock as well as other countries. Most countries in AEC (except for Thailand and Indonesia) bear negative effect in total welfare, however, the changes are quite small and almost insignificant compared to changes in the case of the TPP. This is understandable because of the low tariffs among ASEAN countries (only 5% or below in almost commodities). Thus, the tariff removal scenarios would not have much impact on livestock sector of AEC countries.

Change in welfare by sub-sector

For all scenarios, liberalization has caused negative effects on Viet Nam's livestock sector at different levels. Accession TPP with all tariff removal could make a negative effect on Viet Nam livestock sector. The total welfare of this sector might lose from 31.05-31.46 million USD, depending on various scenarios. Except the "poultry" sub-sector, all the sub-sectors were negatively affected. In which, milk powder sub-sector experienced the largest losses with 20.3 million USD of total welfare.

Table 4.7. Changes in Viet Nam's Welfare (million USD)

	Scenario					
	a	b	c	d	e	f
Live bovine	-0.44	-0.44	-0.45	0.00	-0.01	-0.45
Live swine	0.00	0.00	0.00	0.00	0.00	0.00
Live poultry	-0.44	-0.44	-0.44	-0.01	-0.01	-0.44
Bovine meat	-0.98	-0.99	-0.99	0.00	0.00	-0.99
Swine meat	-0.28	-0.28	-0.28	0.00	0.00	-0.28
Poultry meat	0.23	0.22	0.22	0.00	0.00	0.22
Raw milk	-0.07	-0.07	-0.07	0.00	0.01	-0.06
Milk powder	-20.22	-20.29	-20.29	-0.01	-0.01	-20.29
Others	-8.86	-8.88	-8.88	-0.17	-0.17	-9.05
Total	-31.05	-31.16	-31.18	-0.18	-0.19	-31.34

Source: Authors' simulations

For two scenarios assessing the impact of AEC to Viet Nam, the simulation results indicate that the influence of tariff reductions in the AEC is not significant to Viet Nam's livestock sector. In that case, the welfare of livestock sector of Viet Nam only lost by 0.18-0.19 million USD.

Viet Nam's welfare decomposition

As in the above analysis, the welfare in this model is measured through consumer/importer surplus, producer/exporter surplus; and changes in tax revenue. Overall, consumers/importers tend to gain more than the losses of the producers/exporters after TPP. For scenario b, the surplus of Viet Nam's consumers/exporters is 19.07 million USD, while producers/exports only lose by 14.54 million USD. This is similar to the other scenarios which

assesses the TPP effect. Notice that this deficit of producers are primarily in three meat sub-sectors (no. 4, 5, 6), while other sub-sectors without sufficient data on domestic absorption, have no any clearly impact on domestic producers.

The reduction of tariff barriers has always caused tax burdens for government because of the absence of tax revenue from import. For TPP, in scenario b, Viet Nam's tax revenue lost about 35.7 million USD, thus, total welfare of Viet Nam's livestock sector is negative in all scenarios.

Another remarkable point is that the dairy market showed the opposite effects of trade liberalization. In this case, we can see obviously that current applied tariffs of some countries such as Canada, Mexico and Japan are very high, especially in livestock sector¹. Therefore, when tariffs are removed, dairy products from other countries tend to shift to these markets (except for raw milk). This has significant impacts on the movement of trade flows among countries. The large reduction in tariff causes dairy products' tendency to move to these countries. It is due to the decline in Viet Nam's domestic supplies, the domestic prices are pushed up. Thus, consumer will suffer in this case. Instead, a part of domestic producers will be more beneficial when the domestic prices of dairy products increase.

In addition, unlike other sectors, the gain of consumers of poultry sub-sector is greater than the losses of producers and tax revenue, thus the welfare of this sub-sector is also positive after TPP.

Table 4.8. Viet Nam's Welfare by Component (million USD)

	Scenario b				Scenario e			
	X	Y	Z	W	X	Y	Z	W
Live bovine	0.00	2.12	-2.56	-0.44	0.00	0.01	-0.01	-0.01
Live swine	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Live poultry	0.00	-0.28	-0.16	-0.44	0.00	0.01	-0.02	-0.01
Bovine meat	-2.36	4.29	-2.92	-0.99	0.00	0.00	0.00	0.00
Swine meat	-0.85	1.51	-0.94	-0.28	0.00	0.00	0.00	0.00
Poultry meat	-11.46	20.93	-9.25	0.22	0.00	0.01	0.00	0.00
Raw milk	0.02	0.54	-0.62	-0.07	0.00	0.01	-0.01	0.01
Milk powder	0.00	-7.27	-13.03	-20.29	0.00	0.10	-0.11	-0.01
Others	0.10	-2.77	-6.21	-8.88	0.01	0.08	-0.27	-0.17
Total	-14.54	19.07	-35.70	-31.17	0.01	0.22	-0.43	-0.19

Source: Authors' simulations

1. Average tariff of milk powder sub-sector in Canada, Japan and Mexico are 200-270%; 101%; and 38-40%, respectively; while the highest average tariffs of other items in these countries are respectively 185%; 172%; and 46%, depends on the specific partner.

In contrast, in cases of AEC, tariff reduction in dairy products sub-sector helps consumer/importers gain more benefits because more trade flows from regional countries would move to Viet Nam. However, Viet Nam's total trade of livestock sector with these countries is still very low, thus the changes in consumers/importers surplus are not large. Therefore, the welfare of livestock sector is still negative because of large reduction in tax revenues.

Trade Flows

In GSIM model, based on the assumptions about elasticities, a change in tariff rate will lead to a change in trade value among countries. Then, there is a new equilibrium in which prices, output will be vary by country.

By country

Considering the whole livestock sector, Japan, Mexico and Canada are countries which currently have the highest average tariff rates on imported products from other countries, respectively 45.8%; 45.5% and 31.8%. Meanwhile, tariff rates of some countries have already reduced to 0% or nearly 0% such as Australia, Singapore or Brunei. This difference leads to trade flows' tendency to shift from countries applying lower rate of tariff to the others after TPP.

For all scenarios after TPP implementation, Japan and Mexico have the largest increases in imports, respectively 4.2 and 2.1 billion USD (corresponding to 60-62% of imports before TPP). Canada also has a larger increase in imports than the rest, depending on different scenarios, Canada's imports might extend about 0.56 billion USD, corresponding to 28% imports of livestock sector in 2013.

Table 4.9. Changes in Import Value of Livestock Sector (million USD)

	Scenario						Total import
	a	b	c	d	e	f	
Australia	-35.63	-35.16	-35.16	0.01	0.01	-35.15	709.26
Brunei	-1.41	-1.40	-1.40	-0.01	-0.01	-1.40	49.58
Canada	563.05	564.66	564.66	0.00	0.00	564.64	2015.86
Chile	77.44	77.74	77.74	0.00	0.00	77.74	338.50
Japan	4236.75	4239.20	4239.21	0.08	0.09	4239.20	6794.45
Malaysia	-22.38	-21.80	-21.71	0.76	0.86	-21.05	1041.47
Mexico	2115.47	2118.09	2118.09	0.03	0.03	2118.09	3472.44
New Zealand	-1.99	-1.83	-1.83	0.00	0.00	-1.83	259.48
Peru	2.81	2.93	2.93	0.00	0.00	2.93	185.74
Singapore	-51.07	-49.80	-49.77	-0.10	-0.02	-49.80	2673.86
US	435.13	439.13	439.13	0.02	0.02	439.14	6812.04

In contrast to imports, the TPP scenario simulations show that not only TPP countries but also the non-TPP countries gain in exports. Exports of all countries increase depending on each country and trade volume between countries. It is understandable because both the TPP and AEC enhance trade liberalization not only intra-group but also outside of it. It is due to the movement of trade flows and the reduction of NTBs which non-TPP or non-AEC countries can also enjoy. When trade flows are shifting from TPP countries which have lower tariff rate or non-TPP countries to others, these countries have to strengthen their trade with each other in order to offset shortages of commodity supply caused by TPP. For instance, the 78.7 million USD decrease in Singapore's imports is due the reduction of export to this market by major partners such as Australia, New Zealand and the US. Therefore, Singapore has to seek other partners outside TPP such as Indonesia and Thailand in order to compensate for the supply shortages in livestock sector. Thus, TPP gives opportunities for non-TPP countries to enhance their exports, not just for TPP countries.

Table 4.11. Changes in Export Value of Livestock Sector (million USD)

	Scenario						Total export
	a	b	c	d	e	f	
Australia	909.56	914.15	914.55	-0.15	-0.18	914.34	5456.56
Brunei	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Canada	680.49	682.36	682.37	0.00	0.00	682.36	4250.29
Chile	306.44	306.72	306.72	0.00	0.00	306.71	378.73
Japan	14.82	14.02	14.02	0.00	0.00	14.02	25.99
Malaysia	9.01	9.06	9.07	0.26	0.35	9.10	111.57
Mexico	429.04	429.97	429.97	-0.01	-0.01	429.97	1627.86
New Zealand	662.42	665.53	665.63	-0.61	-0.64	665.26	5485.51
Peru	0.00	0.00	0.00	0.00	0.00	0.00	0.01
Singapore	17.60	17.60	17.61	0.34	0.37	17.83	43.94
US	4315.20	4319.38	4319.88	-0.29	-0.31	4319.34	9524.36
Viet Nam	0.69	0.69	0.70	0.35	0.36	1.05	7.74
Cambodia	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Indonesia	1.16	1.16	1.18	0.15	0.17	1.34	20.52
Thailand	1.85	1.82	1.99	2.06	2.24	4.11	130.67

Source: Authors' simulations

The US is the country which has the largest export change after TPP. All scenarios indicate that exports of the US livestock sector may increase by 45.3% exports in 2013, corresponding to 4.3 billion USD. Some countries which have comparative advantages in

livestock sector such as Australia, New Zealand or Canada may also increase by 0.66-0.91 billion USD, corresponding to 12-16% of export values in 2013.

In case of AEC implementation, despite the fact that the impacts on signatories are insignificant, the flows of trade illustrate the movement from non-AEC countries to AEC members. It results in the decline in exports of a number of countries namely Australia, Mexico, New Zealand and the US while exports of AEC participants increase such as Thailand, Singapore or Viet Nam.

Change in Viet Nam's trade by commodity and partner

Table 4.12, 4.13 and 4.14 provide information about the changes in Viet Nam's imports by partner as well as sub-sector (in scenarios b and f). By partner, Viet Nam mainly imports livestock products from some TPP countries such as the US, New Zealand and Australia. As analyzed above, Viet Nam's imports might increase by 9.6-9.8% after TPP, this changes in import basically stems from the US, New Zealand and a part from Australia.

It is obvious that the change imports from New Zealand are mostly in milk powder and dairy products, which commodities New Zealand has comparative advantages. The simulation results also show that the movement of import flows in this case. Rather than importing from the US, Viet Nam tends to increase milk powder and dairy products imports from New Zealand. Therefore, the total import values of these sub-sectors increase 10.24 and 2.83 million USD respectively. However, this is mainly because of the higher domestic prices rather than import quantity, the milk powder price increased by 1.96% according to scenario b (Table 4.15). Meanwhile, imports from Australia might sharply increase in live bovine sub-sector.

The major products imported from the US are meat products such as bovine, swine and poultry sub-sectors, with the largest change in poultry sub-sector. After TPP, for scenario b, poultry meat imports from the US might increase by 34.14 million USD, while bovine meat imports only increase by 7.64 million USD.

Table 4.12. Changes in Viet Nam's Import by Partner (million USD)

	Scenario						Total import
	a	b	c	d	e	f	
Australia	7.44	7.58	7.56	-0.03	-0.04	7.55	91.89
Brunei	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Canada	2.03	2.04	2.04	-0.01	-0.01	2.04	10.66
Chile	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Japan	0.01	0.01	0.01	0.00	0.00	0.01	0.08
Malaysia	0.61	0.62	0.62	0.52	0.53	0.61	4.59
Mexico	1.65	1.65	1.65	0.00	-0.01	1.65	2.92
New Zealand	35.93	36.19	36.19	-0.29	-0.29	36.15	250.59

	Scenario						Total import
	a	b	c	d	e	f	
Peru	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Singapore	-0.55	-0.54	-0.54	0.22	0.23	-0.54	1.36
US	18.62	19.03	19.03	-0.26	-0.26	19.01	284.18
Viet Nam*	-36.83	-36.98	-36.98	-0.01	-0.01	-36.98	5103.69
Campuchia	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Indonesia	-0.04	-0.04	-0.04	0.30	0.31	0.28	1.52
Thailand	-1.19	-1.21	-1.17	-0.04	0.00	-1.22	23.60

*: change in domestic absorption (for three meat sub-sectors)

Source: Authors' simulations

Note that if we had sufficient data on domestic absorption, the change in imports of Viet Nam from Viet Nam could indicate the reduction of domestic production for domestic consumption (for three meat sub-sectors in this study). The results showed that the domestic producers are slightly affected. In all scenarios, the production of three meat sub-sectors (4, 5 and 6) falls by only 0.72% of total production while the impact of the AEC is not clear.

Table 4.13. Changes in Viet Nam's Import by Partner and Sub-sector
(scenario b, million USD)

	Live bovine	Live swine	Live poultry	Bovine meat	Swine meat	Poultry meat	Raw milk	Milk powder	Others	Total
Australia	4.35	0	0.03	1.08	0.00	0.03	0.21	1.40	0.48	7.58
Brunei	0	0	0	0	0	0	0	0	0	0.00
Canada	0	0.00	0	0.01	1.98	0.08	0	0.31	-0.35	2.04
Chile	0	0	0	0	0	0	0	0	0	0.00
Japan	0	0	0	0	0	0.01	0	0.00	0.00	0.01
Malaysia	0	0	0.16	0	0.00	0.01	0	0.39	0.05	0.62
Mexico	0	0	0	0.05	0	0	0	0	1.60	1.65
New Zealand	-0.25	0	0.03	0.19	0	0	0.55	17.99	17.68	36.19
Peru	0	0	0	0	0	0	0	0	0	0.00
Singapore	0	0	0	0	0	0	0.00	0.12	-0.66	-0.54
US	0	0.00	-0.17	7.64	1.28	36.14	0.00	-9.97	-15.89	19.03
Viet Nam	0	0	0	-6.06	-2.25	-28.67	0	0	0	-36.98
Cambodia	0	0	0	0	0	0	0	0	0	0.00

	Live bovine	Live swine	Live poultry	Bovine meat	Swine meat	Poultry meat	Raw milk	Milk powder	Others	Total
Indonesia	0	0	0	0	0	0	0.00	0.00	-0.04	-0.04
Thailand	-1.12	0.00	0	0	0	0.00	-0.03	0	-0.06	-1.21
Total*	2.98	0.00	0.05	8.97	3.26	36.27	0.72	10.24	2.83	

*: not including changes in domestic absorption

Source: Authors' simulations

Table 4.14 simulates impact of AEC on Viet Nam's imports, the results showed that imports from AEC countries have increased in almost all sub-sectors such as live bovine from Thailand; milk powder and dairy products from Malaysia, Thailand and Singapore. Besides, imports from non-AEC countries tend to decrease, although the changes are not significant.

Table 4.14. Changes in Viet Nam's Import by Partner and Sub-sector
(scenario e, million USD)

	Live bovine	Live swine	Live poultry	Bovine meat	Swine meat	Poultry meat	Raw milk	Milk powder	Others	Total
Australia	-0.01	0	0.00	0.00	0.00	0.00	-0.01	-0.01	-0.01	-0.04
Brunei	0	0	0	0	0	0	0	0	0	0.00
Canada	0	0.00	0	0.00	0.00	0.00	0	0.00	0.00	-0.01
Chile	0	0	0	0	0	0	0	0	0	0.00
Japan	0	0	0	0	0	0.00	0	0.00	0.00	0.00
Malaysia	0	0	0.05	0	0.00	0.01	0	0.34	0.13	0.53
Mexico	0	0	0	0.00	0	0	0	0	-0.01	-0.01
New Zealand	0.00	0	0.00	0.00	0	0	-0.02	-0.15	-0.12	-0.29
Peru	0	0	0	0	0	0	0	0	0	0.00
Singapore	0	0	0	0	0	0	0.00	0.10	0.12	0.23
The US	0	0.00	-0.02	0.00	0.00	0.00	0.00	-0.15	-0.08	-0.26
Viet Nam	0	0	0	0.00	0.00	-0.01	0	0	0	-0.01
Cambodia	0	0	0	0	0	0	0	0	0	0.00
Indonesia	0	0	0	0	0	0	0.00	0.00	0.30	0.31
Thailand	0.03	0.00	0	0	0	0.00	0.03	0	-0.06	0.00
Total*	0.02	0.00	0.02	0.00	0.00	0.01	0.01	0.12	0.27	

Prices

Changing trade among countries makes the supply of livestock products in each country varying, and leads to the changes in commodity prices and output as well. Table 4.15 describes the percentage change in the prices in Viet Nam's livestock sector, including both consumer prices and producer prices. The reduction of consumer prices benefit consumers/importers, and the surplus of producers/exporters tends to increase as the producer prices increase. It is noticed that the producer prices of one country will only change when this country has exports or the data of domestic absorption of a product is available. In this study, live animals groups (1, 2 and 3) do not have any changes in producer prices. Meanwhile, meat groups (4, 5 and 6) have full simulation results based on export values and estimated data of trade with self. Finally, the changes in producer prices in milk and dairy products groups (7, 8 and 9) are only included the changes in price of exports because of the limitation of data in domestic absorption.

After TPP, with the assumptions of tariffs and non-tariffs, the producer prices in meat groups tend to decrease. The main reason comes from the competition from other countries in TPP. It makes these products more available in the domestic market. The results presented in Table 4.8 shows that the producers of poultry sub-sector suffered the most in meats group with the welfare reduction of 11.46 million USD. Unlike meat groups, dairy groups recorded the small exports in powder milk and other dairy products. Therefore, the prices of exported commodities tend to rise due to the removal of tariffs applied by other countries, so Vietnamese exporters have a small surplus (Table 4.8).

For consumers/importers, the market will become more competitive after tariff removal but it uncertainty could help domestic prices drop. Simulation results show that prices of meat groups and live bovine sub-sector (group 1, 4, 5 and 6) decrease due to competition. Similar to the producers, the consumers of poultry sub-sector are also the biggest beneficiaries, where the surplus increased by 20.93 million USD in scenario b.

Meanwhile, a number of other items such as milk powder and other dairy products have completely opposite results. Increases in consumer prices of these sub-sectors cause the welfare of consumers/importers to decrease after trade liberalization. As explained about the changes in trade flows, the flow of goods and products withdraw from Viet Nam to other countries and the commodity supply become scarce. Finally, it negatively affects the domestic consumers/importers of these sub-sectors after TPP.

Table 4.15. Changes in Prices of Livestock Products (% change)

	Change in Overall Consumer Prices						Change in Producer Price for Home Good					
	a	b	c	d	e	f	a	b	c	d	e	f
Live bovine	-2.30	-2.35	-2.36	0.00	-0.01	-2.36	0.00	0.00	0.00	0.00	0.00	0.00
Live swine	0.11	0.07	0.05	0.00	-0.02	0.05	0.00	0.00	0.00	0.00	0.00	0.00
Live poultry	6.92	6.92	6.92	-0.26	-0.26	6.92	0.00	0.00	0.00	0.00	0.00	0.00

	Change in Overall Consumer Prices						Change in Producer Price for Home Good					
	a	b	c	d	e	f	a	b	c	d	e	f
Bovine meat	-0.44	-0.45	-0.45	0.00	0.00	-0.45	-0.25	-0.26	-0.26	0.00	0.00	-0.26
Swine meat	-0.06	-0.06	-0.06	0.00	0.00	-0.06	-0.03	-0.03	-0.03	0.00	0.00	-0.03
Poultry meat	-1.35	-1.36	-1.36	0.00	0.00	-1.36	-0.78	-0.78	-0.78	0.00	0.00	-0.78
Raw milk	-5.23	-5.28	-5.29	-0.13	-0.13	-5.39	1.15	1.18	1.18	0.14	0.18	1.18
Milk powder	2.03	1.96	1.96	-0.03	-0.03	1.96	1.42	1.44	1.44	0.02	0.06	1.44
Others	1.89	1.84	1.84	-0.05	-0.06	1.82	2.63	2.64	2.64	0.30	0.33	2.66

Source: Authors' simulations

According to the AEC scenarios, consumer prices of these commodities decreased slightly while the producer prices increased. Thus, both consumers/importers and producers/exporters are beneficial from trade liberalization.

Output

Table 4.16 provides the results of changes in livestock sub-sectoral output of Viet Nam under different scenarios of trade liberalization. Output changes can be allocated for domestic consumption or for export purpose, depending on each sub-sector and the availability of data. Therefore, in this study, we only evaluate the change in output of meat group (for domestic consumption) and milk and dairy products group (for export).

For TPP scenarios, the flow of meat products imported from Australia, New Zealand or the US into Viet Nam shrinks the size of Viet Nam's production. In terms of percentage change, the poultry meat sub-sector is mostly affected with a fall of 1.17% output.

Table 4.16. Changes in Output of Viet Nam's Livestock Sector (% change)

	Scenario					
	a	b	c	d	e	f
Live bovine	0.00	0.00	0.00	0.00	0.00	0.00
Live swine	0.00	0.00	0.00	0.00	0.00	0.00
Live poultry	0.00	0.00	0.00	0.00	0.00	0.00
Bovine meat	-0.38	-0.38	-0.38	0.00	0.00	-0.38
Swine meat	-0.05	-0.05	-0.05	0.00	0.00	-0.05
Poultry meat	-1.17	-1.18	-1.18	0.00	0.00	-1.18
Raw milk	1.73	1.78	1.77	0.21	0.27	1.77
Milk powder	2.13	2.16	2.16	0.03	0.09	2.16
Others	3.94	3.96	3.96	0.46	0.49	3.98

Source: Authors' simulations

Inversely, the output milk and dairy products group might increase by 1.73-3.98% after TPP, depending on each subsector and each scenario; and increase by 0.03-0.49% in the case of AEC. This is completely consistent with the increase in export value of this sub-sector as well as the gain of exporter due to trade liberalization.

Sensitivity Analysis

Sensitivity analysis of welfare aims to indicate that the total welfare of livestock sector is not sensitive to the choice of elasticity of substitution values. Table 4.17 compares the results of economic welfare in scenario b between two values of elasticity of substitution, respectively 5 and 7.5.

Table 4.17. Sensitivity Analysis Results (scenario b, million USD)

	$E_b = 5$				$E_b = 7,5$			
	X	Y	Z	W	X	Y	Z	W
Live bovine	0.00	2.12	-2.56	-0.44	0.00	2.20	-2.56	-0.37
Live swine	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Live poultry	0.00	-0.28	-0.16	-0.44	0.00	-0.29	-0.16	-0.45
Bovine meat	-2.36	4.29	-2.92	-0.99	-3.66	5.54	-2.89	-1.01
Swine meat	-0.85	1.51	-0.94	-0.28	-1.39	2.04	-0.94	-0.29
Poultry meat	-11.46	20.93	-9.25	0.22	-18.33	27.99	-9.14	0.53
Raw milk	0.02	0.54	-0.62	-0.07	0.03	0.50	-0.63	-0.10
Milk powder	0.00	-7.27	-13.03	-20.29	0.00	-7.08	-13.03	-20.11
Others	0.10	-2.77	-6.21	-8.88	0.13	-2.50	-6.23	-8.60
Total	-14.54	19.07	-35.70	-31.17	-23.21	28.39	-35.56	-30.38

Source: Authors' simulations

In this study, we only do sensitivity analysis for scenario b. In this case, there is a very small change in total welfare, less than 3% of total welfare, when E_b increases from 5 to 7.5. A higher elasticity of substitution implies that goods become easily interchangeable among countries, and trade flows become more fluctuating. The gains of producers/exporters tend to significantly reduce and shift to the consumers/importers. Thus, the changes in total welfare are insignificant in either case of sensitivity analyses.

As E_b increased from 5 to 7.5, Viet Nam's producers/exporters surplus fell from negative 14.54 to negative 23.21 million USD, while surplus of consumers/importers increased from 19.07 to 28.39 million USD. Thus, the total welfare of Viet Nam's livestock sector increased slightly by 0.79 million USD.

Therefore, a higher value of elasticity of substitution causes a shift of gain from producers/exporters to consumers/importers. Especially, due to Vietnamese consumers

preference to warm meat cannot change in the short-term, frozen meat from other countries will find it difficult to enter Viet Nam's market. That means the elasticity of substitution is quite low in Viet Nam. It implies that the meat industries will not suffer by TPP in the short-term. However, as consumer habits change gradually, shifting toward frozen meat, which means a higher elasticity of substitution, the surplus will gradually shift from domestic producers to consumers. Table 4.18 describes the welfare of domestic producers and consumers in two cases, the current habits ($E_b = 1.5$) and the habits are changed ($E_b = 5$).

Table 4.18. Welfare by Meat Sub-sector: Changes in Elasticity of Substitution

	$E_b = 1,5$				$E_b = 5$			
	X	Y	Z	W	X	Y	Z	W
Bovine meat	-0.11	2.03	-3.0	-1.06	2.36	4.29	-2.92	-0.99
Swine meat	-0.02	0.68	-0.94	-0.28	-0.85	1.51	-0.94	-0.28
Poultry meat	-0.81	10.09	-9.25	-0.03	-11.46	20.93	-9.25	0.22

Source: Authors' simulations

The analysis of the results obtained from GSIM model shows us the followings.

In those scenarios assessing the impacts of trade liberalization on Viet Nam's livestock sector, the impact of Viet Nam participation in AEC is almost negligible. Meanwhile, TPP has clear impacts on the livestock sector through welfare, imports and domestic production. Considering the overall livestock sector, consumers/importers will have access to cheaper products, while producers/exporters which largely affected for not being able to compete with the influx of products from other countries such as bovine from Australia and poultry and swine meat from the US. Along with that, the reduction in welfare due to the loss of import tariff revenue causes the welfare of the livestock sector to decline after TPP takes effect.

Trade liberalization aims for complete removal of tariff barriers and partial removal of non-tariff barriers, which leads to a change in trade flows between countries. The results show that trade flows tend to re-direct from countries with low levels of tariff reduction to countries with greater reductions. By sub-sector, Viet Nam reduces its import of milk powder and dairy products from the US and shifts to import from New Zealand. It also increases the import of live bovine from Australia and meat products from the United States.

Changes in export prices lead to a new equilibrium prices in the market including manufacturer's prices and consumer prices. In the case of Viet Nam, meat products from abroad will flood the domestic market, causing negative impacts on the welfare and output value of domestic producers. On the other hand, the consumers will benefit from more competitive markets which leads to reduced prices.

Regarding the sub-sectors, except for poultry meat group, in all live animals and other meat sub-sectors consumers/importers and producers/exporters are slightly affected. Meanwhile, poultry meat sub-sector is significantly affected because of the higher current

applied tariffs and larger import volumes than other sub-sectors. Therefore, after TPP, this sub-sector will be most strongly affected. However the welfare of this sub-sector is still balance as the benefits of consumers/importers could compensate for the losses of tariff revenue and producers/exporters.

A remarkable point is that for milk powder and dairy products (except for raw milk), changes in trade flows cause Viet Nam's consumers/importers to suffer due to the reduction in supplies after TPP. Reduction in tax revenues of this sub-sector is also the main cause leading to the losses of total welfare of Viet Nam's livestock sector.

The sensitivity analysis results show that the assumptions of elasticity have no major influence on the outcome of the overall welfare. It only redistributes the benefits of different factors involved in the livestock sector. Producer surplus will gradually shift to consumer when substitution elasticity increases. In the short term, as consumer habits cannot change quickly, the impacts of trade liberalization on domestic producers are not as severe. However, in the mid and long term, as frozen meat will be more widely accepted, domestic production will face more difficulties in competing with meat products from TPP countries.

CHAPTER 5

CONCLUSIONS AND POLICY DISCUSSIONS

CONCLUSIONS

This study, after reviewing the main features and trends of TPP and AEC, makes a quantitative evaluation of potential economic impacts of liberalizing trade in goods and services under TPP and AEC on Viet Nam in relation to its trading partners. Detailed discussions on the macroeconomic impacts as well as those on the livestock sectors are provided. Based on the recently published Global Trade Analysis Project (GTAP) Data Base version 9, we conduct a set of numerical experiments to simulate the economic effects arising from the establishing TPP and AEC on both the macroeconomy and the livestock sector of Viet Nam. Also, with the ambition to measure the diverse results across livestock sub-sectors (which GE models tend not to be sufficient to cover details), we use a PE model at the same time. Based on the data from UN Comtrade, we run similar simulation exercises using the Global Simulation Analysis of Industry-level Trade Policy (GSIM) for our PE analysis of the livestock sector.

For the economy as the whole, in almost all simulation scenarios, Viet Nam is shown to be the member achieving the largest GDP change in percentage term. However, the economic impact of AEC is insignificant compared to that of TPP. When decomposing the GDP change, it is observed that the increase in GDP, thanks to trade liberalization, comes primarily from increases in consumption and investment, surpassing the surge in import after tariff cut. Moreover, Viet Nam also gains the most in economic welfare in percentage change.

Regarding investment, the gain for Viet Nam is the most outstanding among member countries, approximate to Japan and almost double that of Australia, Malaysia and the US (in scenarios without spillover effect of trade facilitation to non-TPP economies). Concerning the sectoral change thanks to the TPP, we observe an adjustment in Viet Nam's production and labor away from industries without comparative advantage or with eroding comparative advantage (such as MProc, OthMnfc and agricultural sectors) and towards the comparatively advantaged ones or those with negligible trade (especially Apparel, Leather Manufacturing and Utility Services & Construction). At the same time, we observe a significant movement of production resources from shrinking sectors to expanding ones.

Examining the scenarios assessing TPP's impacts, results show that Viet Nam's trade with other TPP countries increases in all case. Meanwhile, Viet Nam increases imports and slightly decreases exports with non-TPP economies. Exports in textiles, apparel, leather and footwear from Viet Nam to the US surge impressively while Viet Nam's total exports slightly declines. The possible reasons for this decrease include the contraction of a number of domestic industries due to the competition from other countries, the competition (and constraints) in primary factors and the change in trade directions from outside TPP to TPP. In particular, once the condition of fixed endowment of labor is relaxed, exports turn to increase

because of labor supply increase and more resources are employed. Unavoidable weaknesses of the model, the static nature and the fixed endowment assumption in particular, also cause bias in the results.

For Viet Nam's livestock sector, the study provides in-depth analysis of the trends in consumption, production, and trade as well as markets structure in the livestock sector. Viet Nam's livestock sector has low competitiveness, featuring mostly small scale farming and production, heavy dependence on imported breeds and feeds, common disease-stricken problems, limited slaughter hygiene and food safety and environmental pollution. These features are prominent across all livestock sub-sectors such as swine, poultry, cattle, milk and dairy. They cause low productivity, production output and the increasing need for imports from TPP countries, especially the US, Australia, New Zealand, Canada, and some AEC countries such as Thailand. Livestock domestic production will face further and fiercer competition when Viet Nam integrates deeper into the regional and world economies and specifically when TPP is expected to come into effect in 2016.

The simulation results reveal that in both free trade blocs, output will decline in almost all livestock industries, except for other animal products (mainly live swine and poultry). In particular, the output of other meat (swine meat, poultry meat, offal and fat) will fall most remarkably in terms of absolute value and percentage change. Moreover, the declining output also leads to a drop in the labor demand (both skilled and unskilled) in the livestock sector. We observe the narrowing down of the whole sector after TPP and to a smaller degree AEC. Given the low productivity and competitiveness of the sector, poultry (and to a lesser extent swine meat) producers will suffer the most in terms of output and welfare though the current consumption habit of Vietnamese people most of whom prefer fresh/warm meat than frozen one may slow down the impacts. On the other hand milk and beef producers have better chance of survival. The sector needs quick restructuring efforts to improve efficiency in facing foreign competitors.

In those scenarios assessing the impacts of trade liberalization on Viet Nam's livestock sector, the impact of Viet Nam participation in AEC is almost negligible. Meanwhile, TPP has clear impacts on the livestock sector through welfare, imports and domestic production. Considering the overall livestock sector, consumers/importers will have access to cheaper products, while producers/exporters which largely affected for not being able to compete with the influx of products from other countries such as bovine from Australia and poultry and swine meat from the US. Along with that, the reduction in welfare due to the loss of import tariff revenue causes the welfare of the livestock sector to decline after TPP effect.

Trade liberalization aims for complete removal of tariff barriers and partial removal of non-tariff barriers, which leads to a change in trade flows between countries. The results show that trade flows tend to re-direct from countries with low levels of tariff reduction to countries with greater reductions. By sub-sector, Viet Nam reduces its import of milk powder and dairy products from the US and shifts to import from New Zealand. It also increases the import of live bovine from Australia and meat products from the United States.

Changes in export prices lead to a new equilibrium prices in the market including manufacturer's prices and consumer prices. In the case of Viet Nam, meat products from abroad will flood the domestic market, causing negative impacts on the welfare and output value of domestic producers. On the other hand, the consumers will benefit from more competitive markets which leads to reduced prices.

Regarding the sub-sectors, except for poultry meat group, in all live animals and other meat sub-sectors consumers/importers and producers/exporters are slightly affected. Meanwhile, poultry meat sub-sector is significantly affected because of the higher current applied tariffs and larger import volumes than other sub-sectors. Therefore, after TPP, this sub-sector will be most strongly affected. However the welfare of this sub-sector is still balance as the benefits of consumers/importers could compensate for the losses of tariff revenue and producers/exporters.

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POLICY DISCUSSIONS

The research findings above provide the foundation and evidences for our policy discussion. The discussion is divided into two main parts. The first part focuses on the macroeconomic level, arguing for or against certain policies that have broad impacts on the economy as a whole. On the other hand, the second part goes into detailed discussion on the implications for sectoral policies that address specific issues of the livestock sector.

The desk study and the field trips show that at sectoral level, businesses, suppliers, farmers, etc. are not aware of the contents and expected impacts and implications of TPP and AEC even though they wish to be more involved. In the case of TPP, where talk contents are still secretive in many aspects, understanding and awareness are even lower. Thus, raising awareness, understanding and involvement of stakeholders regarding the contents and implications of each FTA, particularly TPP and AEC, is essential. Thus the measures to raise awareness and involvement of the public, the policy makers, the businesses, labors, farmers... need to be paid due attention from the beginning and throughout all trade talks. At the same time, international integration requires urgent changes in policy and institutions in related areas and industries. For this process to work effectively, in addition to the role of

policy makers, it is essential to include the active involvement of various stakeholders such as workers, businesses and especially related associations namely consumer association,

implementation, evaluation and financial resources. Also, many problems arise during the implementation process which is considered as slow and unclear. It is clear that there is a need for the participation of labor, businesses and associations in the livestock sector in the process of developing restructuring policy, adapting to international integration's requirements including increasing the knowledge on technical standards in trade and in production.

On the Whole Livestock Sector

The research results confirm that livestock is not one of the sectors that Viet Nam currently has comparative advantage. More competition from imported products will force the sector to restructure to be more efficient in order to survive. Inefficient households, farms and firms, for example those in swine and poultry meat subsectors, will exit the market while surviving ones will need to restructure to be able to compete. In the meantime, policies toward restructuring the livestock sector are needed to satisfy the need for increasing food consumption, to assist the smooth change for those who are required to change their jobs and to ease the losses suffered by those who are forced to move out of the sector. The recent scheme on "livestock sector restructuring towards raising added values and sustainable development" and its accompanying action plans are heading in this direction with proposed changes in production regions, livestock types, production methods and value chains. However, the plans need more details with more specific targets and the implementation process is slow. The Government needs to consider policies that can further support research and development activities to improve added values to Vietnamese products.

During integration process, temporary measures such as optimal tariff reduction schedule, and the use of non-tariff barriers might be considered to protect priority subsectors and assist in the transition of resources from disadvantageous subsectors to other priority subsectors or even to other advantageous sectors of the economy such as textile and apparels, etc. However, these protective measures should not be sustained for more than a few years as they go against the rules of free trade.

Restructuring schemes and action plans should also give priority to subsectors that are and will not be under fierce competition from abroad due to: consumption habits, natural trade barriers (fresh milk, eggs) or specialized Vietnamese products such as certain kinds of chickens (happy/free roaming chickens), lon man, lon cap nach (special kinds of swine), etc. It should be noticed that the consumption habit will change gradually over time. Also, the livestock sub-sectors benefiting from the natural barriers mentioned above have low productivity and/or are insufficient for domestic demand. For these specialized products, potential expansion is limited due to the constraints in domestic demand and export opportunities, thus restructuring should aim at improving productivity and sanitary/phytosanitary standards.

Tax policies for the livestock sector also need to encourage new models of development such as high-tech farms, modern collective farms or large scale farms with closed linkages to households and distributors. Tax and fee structure for livestock products also need to be

restructured. Current taxes and fees are high and/or complicated in certain cases such as the case of eggs and chickens which are carrying 14 to 17 different kinds of taxes and fees from

The purpose of these incentives is to encourage the planning of slaughtering and processing activities, i.e. moving from small and scattered grassroots slaughterhouses to large scale/industrial ones. Large scale/industrial slaughterhouses are to be set up in suburban areas, serving neighboring wholesale market or in big cities and concentrated husbandry areas. At the same time, supervision to minimize unlicensed slaughtering activities, regulations on import of live animals, environmentally friendly and humane slaughtering methods, controls on animal transport at border and gateway to large urban areas are necessary.

However, in practice, though some firms/investors can meet the high standards of concentrated (industrial) slaughterhouses, they are not keen on joining this market. The main reason is the problem with distribution of outputs. Outputs from these slaughterhouses have higher quality, meet the high standards of food safety and environment protection and thus more costly than small household slaughterhouses. Industrial slaughterhouses also need more advanced distribution systems which comprises of cooling vehicles and refrigerated display stalls, etc. The sale of large daily volumes requires close and efficient relationship between slaughterhouses and big retailers (such as supermarkets). Furthermore, the habit of buying meat from open market by the majority of the population though the quality and safety of these sources are questionable. In the future, together with urbanization and the expansion of the middle class in Viet Nam, consumer habits will gradually change. In the near future, to encourage and increase the compatibility of these concentrated slaughterhouses, short term reduction of VAT for them should be considered.

On the Market

As analyzed above, the problems related to the markets for products from large scale farms and slaughterhouses are some of the most serious difficulties for the livestock sector. Developing the market and improving customers' trust are the firms' responsibilities. High quality and safe products will gain consumers' trust and thus increase consumption. Only then, the demand for the products can be guaranteed which in turn becomes the guarantee for firms to invest to utilize economies of scale, reducing costs and improving the competitiveness of domestic products.

However, at present, small scale businesses still dominate and due to the need for large investment in infrastructure, technology, plants and machineries, large scale ones still have to face high costs and difficulties in selling their products. As a result, potential investors are not keen on joining the market. Small scale with low tech but fast sale models are still more appealing. None the less, when join FTAs, the products of firms and households using these models will not be able to compete with imported ones and may have to leave the market.

Thus, measures to increase sales of firms need to match with national programs on encouraging domestic goods consumption, especially with safe and high quality products. The Government and relevant authorities need to provide more detailed guidelines and regulations on brand development and registration, ensure clear and timely market information so domestic firms and households in the livestock sector can prepare for integration.

At present, the problems of lack of transparent market information and commercial frauds are also a great hindrance for firms as well as consumers. The ability of consumers to

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APPENDICES

Appendix 1. Main contents of TPP

No.	Chapter	Content
1	Initial Provisions and General Definitions	<p>Many TPP Parties have existing agreements with one another. The Initial Provisions and General Definitions Chapter recognizes that the TPP can coexist with other international trade agreements between the Parties, including the WTO Agreement, bilateral, and regional agreements. It also provides definitions of terms used in more than one chapter of the Agreement.</p>
2	Trade in Goods	<p>TPP Parties agree to eliminate and reduce tariffs and non-tariff barriers on industrial goods, and to eliminate or reduce tariffs and other restrictive policies on agricultural goods. The preferential access provided through the TPP will increase trade between the TPP countries in this market of 800 million people and will support high-quality jobs in all 12 Parties. Most tariff elimination in industrial goods will be implemented immediately, although tariffs on some products will be eliminated over longer timeframes as agreed by the TPP Parties. The specific tariff cuts agreed by the TPP Parties are included in schedules covering all goods. The TPP Parties will publish all tariffs and other information related to goods trade to ensure that small- and medium-sized businesses as well as large companies can take advantage of the TPP. They also agree not to use performance requirements, which are conditions such as local production requirements that some countries impose on companies in order for them to obtain tariff benefits. In addition, they agree not to impose WTO-inconsistent import and export restrictions and duties, including on remanufactured goods which will promote recycling of parts into new products. If TPP Parties maintain import or export license requirements, they will notify each other about the procedures so as to increase transparency and facilitate trade flows.</p> <p>On agricultural products, the Parties will eliminate or reduce tariffs and other restrictive policies, which will increase agricultural trade in the region, and enhance food security. In addition to eliminating or reducing tariffs, TPP Parties agree to promote policy reforms, including by eliminating agricultural export subsidies, working together in the WTO to develop disciplines on export state trading enterprises, export credits, and limiting the timeframes allowed for restrictions on food exports so as to provide greater food security in the region. The TPP Parties have also agreed to increased transparency and cooperation on certain activities related to agricultural biotechnology.</p>

No.	Chapter	Content
3	Textiles and Apparel	The TPP Parties agree to eliminate tariffs on textiles and apparel, industries which are important contributors to economic growth in several TPP Parties' markets. Most tariffs will be eliminated immediately, although tariffs on some sensitive products will be eliminated over longer timeframes as agreed by the TPP Parties. The chapter also includes specific rules of origin that require use of yarns and fabrics from the TPP region, which will promote regional supply chains and investment in this sector, with a "short supply list" mechanism that allows use of certain yarns and fabrics not widely available in the region. In addition, the chapter includes commitments on customs cooperation and enforcement to prevent duty evasion, smuggling and fraud, as well as a textile-specific special safeguard to respond to serious damage or the threat of serious damage to domestic industry in the event of a sudden surge in imports.
4	Rules of Origin	To provide simple rules of origin, promote regional supply chains, and help ensure the TPP countries rather than non-participants are the primary beneficiaries of the Agreement, the 12 Parties have agreed on a single set of rules of origin that define whether a particular good is "originating" and therefore eligible to receive TPP preferential tariff benefits. The product-specific rules of origin are attached to the text of the Agreement. The TPP provides for "accumulation," so that in general, inputs from one TPP Party are treated the same as materials from any other TPP Party, if used to produce a product in any TPP Party. The TPP Parties also have set rules that ensure businesses can easily operate across the TPP region, by creating a common TPP-wide system of showing and verifying that goods made in the TPP meet the rules of origin. Importers will be able to claim preferential tariff treatment as long as they have the documentation to support their claim. In addition, the chapter provides the competent authorities with the procedures to verify claims appropriately.
5	Customs Administration and Trade Facilitation	Complementing their WTO efforts to facilitate trade, the TPP Parties have agreed on rules to enhance the facilitation of trade, improve transparency in customs procedures, and ensure integrity in customs administration. These rules will help TPP businesses, including small- and medium-sized businesses, by encouraging smooth processing in customs and border procedures, and promote regional supply chains. TPP Parties have agreed to transparent rules, including publishing their customs laws and regulations, as well as providing for release of goods without unnecessary delay and on bond or 'payment under protest' where customs has not yet made a decision on the amount of duties or fees owed. They agree to advance rulings on customs valuation and other matters that will help businesses, both large and small, trade with predictability. They also agree to disciplines on customs penalties that will help ensure these penalties

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5		are administered in an impartial and transparent manner. Due to the importance of express shipping to business sectors including small- and medium-sized companies, the TPP countries have agreed to provide expedited customs procedures for express shipments. To help counter smuggling and duty evasion, the TPP Parties agree to provide information, when requested, to help each other enforce their respective customs laws.
6	Sanitary and Phytosanitary (SPS) Measures	In developing SPS rules, the TPP Parties have advanced their shared interest in ensuring transparent, non-discriminatory rules based on science, and reaffirmed their right to protect human, animal or plant life or health in their countries. The TPP builds on WTO SPS rules for identifying and managing risks in a manner that is no more trade restrictive than necessary. TPP Parties agree to allow the public to comment on proposed SPS measures to inform their decision-making, and to ensure traders understand the rules they will need to follow. They agree that import programmes are based on the risks associated with importations, and that import checks are carried out without undue delay. The Parties also agree that emergency measures necessary for the protection of human, animal, or plant life or health may be taken provided that the Party taking them notifies all other Parties. The Party adopting an emergency measure will review the scientific basis of that measure within six months and make available the results of these reviews to any Party on request. In addition, TPP Parties commit to improve information exchange related to equivalency or regionalisation requests and to promote systems-based audits to assess the effectiveness of regulatory controls of the exporting Party. In an effort to rapidly resolve SPS matters that emerge between them, they have agreed to establish a mechanism for consultations between governments.
7	Technical Barriers to Trade (TBT)	In developing TBT rules, the TPP Parties have agreed on transparent, non-discriminatory rules for developing technical regulations, standards and conformity assessment procedures, while preserving TPP Parties' ability to fulfill legitimate objectives. They agree to cooperate to ensure that technical regulations and standards do not create unnecessary barriers to trade. To reduce costs for TPP businesses, especially small businesses, TPP Parties agree to rules that will facilitate the acceptance of the results of conformity assessment procedures from the conformity assessment bodies in the other TPP Parties, making it easier for companies to access TPP markets. Under the TPP, Parties are required to allow for the public to comment on proposed technical regulations, standards, and conformity assessment procedures to inform their regulatory processes and to ensure traders understand the rules they will need to follow. They also will ensure a reasonable interval between publication of technical regulations

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7		and conformity assessment procedures, and their entry into force, so that businesses have sufficient time to meet the new requirements. In addition, the TPP includes annexes related to regulation of specific sectors to promote common regulatory approaches across the TPP region. These sectors are cosmetics, medical devices, pharmaceuticals, information and communications technology products, wine and distilled spirits, proprietary formulas for prepackaged foods and food additives, and organic agricultural products.
8	Trade Remedies	The Trade Remedies chapter promotes transparency and due process in trade remedy proceedings through recognition of best practices, but does not affect the TPP Parties' rights and obligations under the WTO. The chapter provides for a transitional safeguard mechanism, which allows a Party to apply a transitional safeguard measure during a certain period of time if import increases as a result of the tariff cuts implemented under the TPP cause serious injury to a domestic industry. These measures may be maintained for up to two years, with a one-year extension, but must be progressively liberalized if they last longer than a year. Parties imposing safeguard measures must follow notification and consultation requirements. The chapter also sets out rules requiring that a TPP Party applying a transitional safeguard measure provide mutually-agreed compensation. The Parties may not impose more than one of the safeguards allowed under TPP on the same product at the same time. The Parties may not impose a transitional safeguard measure on any product imported under a TPP tariff rate quota, and may exclude TPP products from a WTO safeguard measure if such imports are not a cause or threat of serious injury.
9	Investment	In establishing investment rules, the TPP Parties set out rules requiring non-discriminatory investment policies and protections that assure basic rule of law protections, while protecting the ability of Parties' governments to achieve legitimate public policy objectives. TPP provides the basic investment protections found in other investment-related agreements, including national treatment; most-favored-nation treatment; "minimum standard of treatment" for investments in accordance with customary international law principles; prohibition of expropriation that is not for public purpose, without due process, or without compensation; prohibition on "performance requirements" such as local content or technology localization requirements; free transfer of funds related to an investment, subject to exceptions in the TPP to ensure that governments retain the flexibility to manage volatile capital flows, including through non-discriminatory temporary safeguard measures (such as capital controls) restricting investment-related transfers in the context of a balance of

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9		payments crisis or the threat thereof, and certain other economic crises or to protect the integrity and stability of the financial system; and freedom to appoint senior management positions of any nationality. TPP Parties adopt a "negative-list" basis, meaning that their markets are fully open to foreign investors, except where they have taken an exception (non-conforming measure) in one of two country-specific annexes: (1) current measures on which a Party accepts an obligation not to make its measures more restrictive in the future and to bind any future liberalization, and (2) measures and policies on which a Party retains full discretion in the future.
10	Cross Border Trade in Services	Given the growing importance of services trade to TPP Parties, the 12 countries share an interest in liberalized trade in this area. TPP includes core obligations found in the WTO and other trade agreements: national treatment; most-favoured nation treatment; market access, which provides that no TPP country may impose quantitative restrictions on the supply of services (e.g., a limit on the number of suppliers or number of transactions) or require a specific type of legal entity or joint venture; and local presence, which means that no country may require a supplier from another country to establish an office or affiliate, or to be resident, in its territory in order to supply a service. TPP Parties accept these obligations on a "negative-list basis," meaning that their markets are fully open to services suppliers from TPP countries, except where they have taken an exception (non-conforming measure) in one of two country-specific annexes attached to the Agreement : (1) current measures on which a Party accepts an obligation not to make its measures more restrictive in the future, and to bind any future liberalisation, and (2) sectors and policies on which a country retains full discretion in the future. TPP Parties also agree to administer measures of general application in a reasonable, objective, and impartial manner; and to accept requirements for transparency in the development of new services regulations. Benefits of the chapter can be denied to shell companies and to a service supplier owned by non-Parties with which a TPP Party prohibits certain transactions. TPP Parties agree to permit free transfer of funds related to the cross-border supply of a service. In addition, the chapter includes a professional services annex encouraging cooperative work on licensing recognition and other regulatory issues, and an annex on express delivery services.
11	Financial Services	The TPP Financial Services chapter will provide important cross-border and investment market access opportunities, while ensuring that Parties will retain the ability to regulate financial markets and institutions and to take emergency measures in the event of crisis. The chapter includes core obligations found in other trade agreements, including: national treatment;

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11		<p>most-favored nation treatment; market access; and certain provisions under the Investment chapter, including the minimum standard of treatment. It provides for the sale of certain financial services across borders to a TPP Party from a supplier in another TPP Party rather than requiring suppliers to establish operations in the other country in order to sell their service subject to registration or authorization of cross-border financial services suppliers of another TPP Party in order to help assure appropriate regulation and oversight. A supplier of a TPP Party may provide a new financial service in another TPP market if domestic companies in that market are allowed to do so. TPP Parties have country-specific exceptions to some of these rules in two annexes attached to the TPP: (1) current measures on which a Party accepts an obligation not to make its measures more restrictive in the future and to bind any future liberalization, and (2) measures and policies on which a country retains full discretion in the future.</p> <p>TPP Parties also set out rules that formally recognize the importance of regulatory procedures to expedite the offering of insurance services by licensed suppliers and procedures to achieve this outcome. In addition, the TPP includes specific commitments on portfolio management, electronic payment card services, and transfer of information for data processing.</p> <p>The Financial Services chapter provides for the resolution of disputes relating to certain provisions through neutral and transparent investment arbitration. It includes specific provisions on investment disputes related to the minimum standard of treatment, as well as provisions requiring arbitrators to have financial services expertise, and a special State-to-State mechanism to facilitate the application of the prudential exception and other exceptions in the chapter in the context of investment disputes. Finally, it includes exceptions to preserve broad discretion for TPP financial regulators to take measures to promote financial stability and the integrity of their financial system, including a prudential exception and exception of non-discriminatory measures in pursuit of monetary or certain other policies.</p>
12	Temporary Entry for Business Persons	<p>The Temporary Entry for Business Persons chapter encourages authorities of TPP Parties to provide information on applications for temporary entry, to ensure that application fees are reasonable, and to make decisions on applications and inform applicants of decisions as quickly as possible. TPP Parties agree to ensure that information on requirements for temporary entry are readily available to the public, including by publishing information promptly and online if possible, and providing explanatory materials. The Parties agree to ongoing cooperation on temporary entry issues such as visa processing. Almost all TPP Parties have made commitments on access for each other's business persons, which are in country-specific annexes.</p>

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13	Telecommunications	<p>TPP Parties share an interest in ensuring efficient and reliable telecommunications networks in their countries. These networks are critical to companies both large and small for providing services. TPP's pro-competitive network access rules cover mobile suppliers. TPP Parties commit to ensure that major telecommunications services suppliers in their territory provide interconnection, leased circuit services, co-location, and access to poles and other facilities under reasonable terms and conditions and in a timely manner. They also commit, where a license is required, to ensure transparency in regulatory processes and that regulations do not generally discriminate against specific technologies. And they commit to administer their procedures for the allocation and use of scarce telecommunications resources, including frequencies, numbers and rights-of-way, in an objective, timely, transparent and non-discriminatory manner. TPP Parties recognize the importance of relying on market forces and commercial negotiations in the telecommunications sector. They also agree that they may take steps to promote competition in international mobile roaming services and facilitate the use of alternatives to roaming. TPP Parties agree that, if a Party chooses to regulate rates for wholesale international mobile roaming services that Party shall permit operators from the TPP countries that do not regulate such rates the opportunity to also benefit from the lower rates.</p>
14	Electronic Commerce	<p>In the Electronic Commerce chapter, TPP Parties commit to ensuring free flow of the global information and data that drive the Internet and the digital economy, subject to legitimate public policy objectives such as personal information protection. The 12 Parties also agree not to require that TPP companies build data centers to store data as a condition for operating in a TPP market, and, in addition, that source code of software is not required to be transferred or accessed. The chapter prohibits the imposition of customs duties on electronic transmissions, and prevents TPP Parties from favoring national producers or suppliers of such products through discriminatory measures or outright blocking. To protect consumers, TPP Parties agree to adopt and maintain consumer protection laws related to fraudulent and deceptive commercial activities online and to ensure that privacy and other consumer protections can be enforced in TPP markets. Parties also are required to have measures to stop unsolicited commercial electronic messages. To facilitate electronic commerce, the chapter includes provisions encouraging TPP Parties to promote paperless trading between businesses and the government, such as electronic customs forms; and providing for electronic authentication and signatures for commercial transactions. A number of obligations in this chapter are subject to relevant non-conforming measures of individual TPP members. The 12 Parties agree to cooperate to help small- and medium-sized</p>

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14		business take advantage of electronic commerce, and the chapter encourages cooperation on policies regarding personal information protection, online consumer protection, cybersecurity threats and cybersecurity capacity.
15	Government Procurement	TPP Parties share an interest in accessing each other's large government procurement markets through transparent, predictable, and non-discriminatory rules. In the Government Procurement chapter, TPP Parties commit to core disciplines of national treatment and non-discrimination. They also agree to publish relevant information in a timely manner, to allow sufficient time for suppliers to obtain the tender documentation and submit a bid, to treat tenders fairly and impartially, and to maintain confidentiality of tenders. In addition, the Parties agree to use fair and objective technical specifications, to award contracts based solely on the evaluation criteria specified in the notices and tender documentation, and to establish due process procedures to question or review complaints about an award. Each Party agrees to a positive list of entities and activities that are covered by the chapter, which are listed in annexes.
16	Competition Policy	TPP Parties share an interest in ensuring a framework of fair competition in the region through rules that require TPP Parties to maintain legal regimes that prohibit anticompetitive business conduct, as well as fraudulent and deceptive commercial activities that harm consumers. TPP Parties agree to adopt or maintain national competition laws that proscribe anticompetitive business conduct and work to apply these laws to all commercial activities in their territories. To ensure that such laws are effectively implemented, TPP Parties agree to establish or maintain authorities responsible for the enforcement of national competition laws, and adopt or maintain laws or regulations that proscribe fraudulent and deceptive commercial activities that cause harm or potential harm to consumers. Parties also agree to cooperate, as appropriate, on matters of mutual interest related to competition activities. The 12 Parties agree to obligations on due process and procedural fairness, as well as private rights of action for injury caused by a violation of a Party's national competition law. In addition, TPP Parties agree to cooperate in the area of competition policy and competition law enforcement, including through notification, consultation and exchange of information. The chapter is not subject to the dispute settlement provisions of the TPP, but TPP Parties may consult on concerns related to the chapter.
17	State-Owned Enterprises	All TPP Parties have SOEs, which often play a role in providing public services and other activities, but TPP Parties recognize the benefit of

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17	M u a s ả m chính phủ	agreeing on a framework of rules on SOEs. The SOE chapter covers large SOEs that are principally engaged in commercial activities. Parties agree to ensure that their SOEs make commercial purchases and sales on the basis of commercial considerations, except when doing so would be inconsistent with any mandate under which an SOE is operating that would require it to provide public services. They also agree to ensure that their SOEs or designated monopolies do not discriminate against the enterprises, goods, and services of other Parties. Parties agree to provide their courts with jurisdiction over commercial activities of foreign SOEs in their territory, and to ensure that administrative bodies regulating both SOEs and private companies do so in an impartial manner. TPP Parties agree to not cause adverse effects to the interests of other TPP Parties in providing non-commercial assistance to SOEs, or injury to another Party's domestic industry by providing non-commercial assistance to an SOE that produces and sells goods in that other Party's territory. TPP Parties agree to share a list of their SOEs with the other TPP Parties and to provide, upon request, additional information about the extent of government ownership or control and the non-commercial assistance they provide to SOEs. There are some exceptions from the obligations in the chapter, for example, where there is a national or global economy emergency, as well as country-specific exceptions that are set out in annexes.
18	Intellectual Property	TPP's Intellectual Property (IP) chapter covers patents, trademarks, copyrights, industrial designs, geographical indications, trade secrets, other forms of intellectual property, and enforcement of intellectual property rights, as well as areas in which Parties agree to cooperate. The IP chapter will make it easier for businesses to search, register, and protect IP rights in new markets, which is particularly important for small businesses. The chapter establishes standards for patents, based on the WTO's TRIPS Agreement and international best practices. On trademarks, it provides protections of brand names and other signs that businesses and individuals use to distinguish their products in the marketplace. The chapter also requires certain transparency and due process safeguards with respect to the protection of new geographical indications, including for geographical indications recognized or protected through international agreements. These include confirmation of understandings on the relationship between trademarks and geographical indications, as well as safeguards regarding the use of commonly used terms. In addition, the chapter contains pharmaceutical-related provisions that facilitate both the development of innovative, life-saving medicines and the availability of generic medicines, taking into account the time that various Parties may need to meet these standards. The chapter includes

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18		<p>commitments relating to the protection of undisclosed test and other data submitted to obtain marketing approval of a new pharmaceutical or agricultural chemicals product. It also reaffirms Parties' commitment to the WTO's 2001 Declaration on the TRIPS Agreement and Public Health, and in particular confirms that Parties are not prevented from taking measures to protect public health, including in the case of epidemics such as HIV/AIDS.</p> <p>In copyright, the IP chapter establishes commitments requiring protection for works, performances, and phonograms such as songs, movies, books, and software, and includes effective and balanced provisions on technological protection measures and rights management information. As a complement to these commitments, the chapter includes an obligation for Parties to continuously seek to achieve balance in copyright systems through among other things, exceptions and limitations for legitimate purposes, including in the digital environment. The chapter requires Parties to establish or maintain a framework of copyright safe harbors for Internet Service Providers (ISPs). These obligations do not permit Parties to make such safe harbors contingent on ISPs monitoring their systems for infringing activity.</p> <p>Finally, TPP Parties agree to provide strong enforcement systems, including, for example, civil procedures, provisional measures, border measures, and criminal procedures and penalties for commercial-scale trademark counterfeiting and copyright or related rights piracy. In particular, TPP Parties will provide the legal means to prevent the misappropriation of trade secrets, and establish criminal procedures and penalties for trade secret theft, including by means of cyber-theft, and for cam-cording.</p>
19	Labor	<p>All TPP Parties are International Labor Organization (ILO) members and recognize the importance of promoting internationally recognized labour rights. TPP Parties agree to adopt and maintain in their laws and practices the fundamental labour rights as recognized in the ILO 1998 Declaration, namely freedom of association and the right to collective bargaining; elimination of forced labour; abolition of child labour and a prohibition on the worst forms of child labour; and elimination of discrimination in employment. They also agree to have laws governing minimum wages, hours of work, and occupational safety and health. These commitments also apply to export processing zones. The 12 Parties agree not to waive or derogate from laws implementing fundamental labour rights in order to attract trade or investment, and not to fail to effectively enforce their labour laws in a sustained or recurring pattern that would affect trade or investment between the TPP Parties. In addition to commitments by Parties to eliminate forced labour in their own countries, the Labour</p>

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19		<p>chapter includes commitments to discourage importation of goods that are produced by forced labour or child labour, or that contain inputs produced by forced labour, regardless of whether the source country is a TPP Party. Each of the 12 TPP Parties commits to ensure access to fair, equitable and transparent administrative and judicial proceedings and to provide effective remedies for violations of its labour laws. They also agree to public participation in implementation of the Labour chapter, including establishing mechanisms to obtain public input.</p> <p>The commitments in the chapter are subject to the dispute settlement procedures laid out in the Dispute Settlement chapter. To promote the rapid resolution of labour issues between TPP Parties, the Labour chapter also establishes a labour dialogue that Parties may choose to use to try to resolve any labour issue between them that arises under the chapter. This dialogue allows for expeditious consideration of matters and for Parties to mutually agree to a course of action to address issues. The Labour chapter establishes a mechanism for cooperation on labour issues, including opportunities for stakeholder input in identifying areas of cooperation and participation, as appropriate and jointly agreed, in cooperative activities.</p>
20	Environment	<p>As home to a significant portion of the world's people, wildlife, plants and marine species, TPP Parties share a strong commitment to protecting and conserving the environment, including by working together to address environmental challenges, such as pollution, illegal wildlife trafficking, illegal logging, illegal fishing, and protection of the marine environment. The 12 Parties agree to effectively enforce their environmental laws; and not to weaken environmental laws in order to encourage trade or investment. They also agree to fulfil their obligations under the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), and to take measures to combat and cooperate to prevent trade in wild fauna and flora that has been taken illegally. In addition, the Parties agree to promote sustainable forest management, and to protect and conserve wild fauna and flora that they have identified as being at risk in their territories, including through measures to conserve the ecological integrity of specially protected natural areas, such as wetlands. In an effort to protect their shared oceans, TPP Parties agree to sustainable fisheries management, to promote conservation of important marine species, including sharks, to combat illegal fishing, and to prohibit some of the most harmful fisheries subsidies that negatively affect overfished fish stocks, and that support illegal, unreported, or unregulated fishing. They also agree to enhance transparency related to such subsidy programs, and to make best efforts to refrain from introducing new subsidies that contribute to overfishing or overcapacity.</p> <p>TPP Parties also agree to protect the marine environment from ship</p>

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20		pollution and to protect the ozone layer from ozone depleting substances. They reaffirm their commitment to implement the multilateral environmental agreements (MEAs) they have joined. The Parties commit to provide transparency in environmental decision-making, implementation and enforcement. In addition, the Parties agree to provide opportunities for public input in implementation of the Environment chapter, including through public submissions and public sessions of the Environment Committee established to oversee chapter implementation. The chapter is subject to the dispute settlement procedure laid out in the Dispute Settlement chapter. The Parties further agree to encourage voluntary environmental initiatives, such as corporate social responsibility programs. Finally, the Parties commit to cooperate to address matters of joint or common interest, including in the areas of conservation and sustainable use of biodiversity, and transition to low-emissions and resilient economies.
21	Cooperation and Capacity Building	The economies of the 12 TPP Parties are diverse. All Parties recognise that the TPP lesser-developed Parties may face particular challenges in implementing the Agreement, and in taking full advantage of the opportunities it creates. To address these challenges, the Cooperation and Capacity Building chapter establishes a Committee on Cooperation and Capacity Building to identify and review areas for potential cooperative and capacity building efforts. Parties' activities are on a mutually agreed basis and subject to the availability of resources. This Committee will facilitate exchange of information to help with requests related to cooperation and capacity building.
22	Competitiveness and Business Facilitation	The Competitiveness and Business Facilitation chapter aims to help the TPP reach its potential to improve the competitiveness of the participating countries, and the Asia-Pacific region as a whole. The chapter creates formal mechanisms to review the impact of the TPP on competitiveness of the Parties, through dialogues among governments and between government, business, and civil society, with a particular focus on deepening regional supply chains, to assess progress, take advantage of new opportunities, and address any challenges that may emerge once the TPP is in force. Among these will be the Committee on Competitiveness and Business Facilitation, which will meet regularly to review the TPP's impact on regional and national competitiveness, and on regional economic integration. The Committee will consider advice and recommendations from stakeholders on ways the TPP can further enhance competitiveness, including enhancing the participation of micro, small- and medium-sized enterprises in regional supply chains. The chapter also establishes a basic framework for Committee to assess

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22		supply chain performance under the Agreement, including ways to promote SME participation in supply chains; and review of stakeholder and expert input.
23	Development	The TPP Parties seek to ensure that the TPP will be a high-standard model for trade and economic integration, and in particular to ensure that all TPP Parties can obtain the complete benefits of the TPP, are fully able to implement their commitments, and emerge as more prosperous societies with strong markets. The Development chapter includes three specific areas to be considered for collaborative work once TPP enters into force for each Party: (1) broad-based economic growth, including sustainable development, poverty reduction, and promotion of small businesses; (2) women and economic growth, including helping women build capacity and skill, enhancing women's access to markets, obtaining technology and financing, establishing women's leadership networks, and identifying best practices in workplace flexibility; and (3) education, science and technology, research, and innovation. The chapter establishes a TPP Development Committee, which will meet regularly to promote voluntary cooperative work in these areas and new opportunities as they arise.
24	Small- and Medium-Sized Enterprises	TPP Parties have a shared interest in promoting the participation of small- and medium-sized enterprises in trade and to ensure that small- and medium-sized enterprises share in the benefits of the TPP. Complementing the commitments throughout other chapters of the TPP on market access, paperwork reduction, Internet access, trade facilitation, express delivery and others, the Small- and Medium-Sized Enterprise chapter includes commitments by each TPP Party to create a user-friendly websites targeted at small- and medium-sized enterprise users to provide easily accessible information on the TPP and ways small firms can take advantage of it, including description of the provisions of TPP relevant to small- and medium-sized enterprises; regulations and procedures concerning intellectual property rights; foreign investment regulations; business registration procedures; employment regulations; and taxation information. In addition, the chapter establishes a Small- and Medium-Sized Enterprises Committee that will meet regularly to review how well the TPP is serving small- and medium-sized enterprises, consider ways to further enhance its benefits, and oversee cooperation or capacity building activities to support small- and medium-sized enterprises through export counseling, assistance, and training programs for small- and medium-sized enterprises; information sharing; trade finance; and other activities.
25	Regulatory Coherence	TPP's Regulatory Coherence chapter will help ensure an open, fair, and predictable regulatory environment for businesses operating in the TPP

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25		markets by encouraging transparency, impartiality, and coordination across each government to achieve a coherent regulatory approach. The chapter aims to facilitate regulatory coherence in each TPP country by promoting mechanisms for effective interagency consultation and coordination for agencies. It encourages widely-accepted good regulatory practices, such as impact assessments of proposed regulatory measures, communication of the grounds for the selection of chosen regulatory alternatives and the nature of the regulation being introduced. The chapter also includes provisions to help ensure regulations are written clearly and concisely, that the public has access to information on new regulatory measures, if possible online, and that existing regulatory measures are periodically reviewed to determine if they remain the most effective means of achieving the desired objective. In addition, it encourages TPP Parties to provide an annual public notice of all regulatory measures it expects to take. Toward these ends, the chapter establishes a Committee which will give TPP countries, businesses, and civil society continuing opportunities to report on implementation, share experiences on best practices, and consider potential areas for cooperation. The chapter does not in any way affect the rights of TPP Parties to regulate for public health, safety, security, and other public interest reasons.
26	Transparency and Anti-Corruption	The TPP's Transparency and Anti-Corruption chapter aims to promote the goal, shared by all TPP Parties, of strengthening good governance and addressing the corrosive effects bribery and corruption can have on their economies. Under the Transparency and Anti-Corruption chapter, TPP Parties need to ensure that their laws, regulations, and administrative rulings of general application with respect to any matter covered by the TPP are publicly available and that, to the extent possible, regulations that are likely to affect trade or investment between the Parties are subject to notice and comment. TPP Parties agree to ensure certain due process rights for TPP stakeholders in connection with administrative proceedings, including prompt review through impartial judicial or administrative tribunals or procedures. They also agree to adopt or maintain laws criminalising offering to, or solicitation of, undue advantages by a public official, as well as other acts of corruption affecting international trade or investment. Parties also commit to effectively enforce their anticorruption laws and regulations. In addition, they agree to endeavor to adopt or maintain codes or standards of conduct for their public officials, as well as measures to identify and manage conflicts of interest, to increase training of public officials, to take steps to discourage gifts, to facilitate reporting of acts of corruption, and to provide for disciplinary or other measures for public officials engaging in acts of corruption. In an Annex to this chapter, TPP Parties also agree to provisions that promote transparency and procedural fairness with respect

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26		to listing and reimbursement for pharmaceutical products or medical devices. Commitments in this annex are not subject to dispute settlement procedures.
27	Administrative and Institutional Provisions	The Administrative and Institutional Provisions Chapter sets out the institutional framework by which the Parties will assess and guide implementation or operation of the TPP, in particular by establishing the Trans-Pacific Partnership Commission, composed of Ministers or senior level officials, to oversee the implementation or operation of the Agreement and guide its future evolution. This Commission will review the economic relationship and partnership among the Parties on a periodic basis to ensure that the Agreement remains relevant to the trade and investment challenges confronting the Parties. The chapter also requires each Party to designate an overall contact point to facilitate communications between the Parties, and creates a mechanism through which a Party that has a specific transition period for an obligation must report on its plans for, and progress toward, implementing that obligation. This ensures greater transparency with respect to the implementation of Parties' obligations.
28	Dispute Settlement	The Dispute Settlement chapter is intended to allow Parties to expeditiously address disputes between them over implementation of the TPP. TPP Parties will make every attempt to resolve disputes through cooperation and consultation and encourage the use of alternative dispute resolution mechanisms when appropriate. When this is not possible, TPP Parties aim to have these disputes resolved through impartial, unbiased panels. The dispute settlement mechanism created in this chapter applies across the TPP, with few specific exceptions. The public in each TPP Party will be able to follow proceedings, since submissions made in disputes will be made available to the public, hearings will be open to the public unless the disputing Parties otherwise agree, and the final report presented by panels will also be made available to the public. Panels will consider requests from non-governmental entities located in the territory of any disputing Party to provide written views regarding the dispute to panels during dispute settlement proceedings. Should consultations fail to resolve an issue, Parties may request establishment of a panel, which would be established within 60 days after the date of receipt of a request for consultations or 30 days after the date of receipt of a request related to perishable goods. Panels will be composed of three international trade and subject matter experts independent of the disputing Parties, with procedures available to ensure that a panel can be composed even if a Party fails to appoint a panelist within a set period of time. These panelists will be subject to a code of conduct to ensure the integrity of the dispute settlement mechanism. They will present an initial

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28		report to the disputing Parties within 150 days after the last panelist is appointed or 120 days in cases of urgency, such as cases related to perishable goods. The initial report will be confidential, to enable Parties to offer comments. The final report must be presented no later than 30 days after the presentation of the initial report and must be made public within 15 days, subject to the protection of any confidential information in the report.
29	Exceptions	<p>The Exceptions Chapter ensures that flexibilities are available to all TPP Parties that guarantee full rights to regulate in the public interest, including for a Party's essential security interest and other public welfare reasons. This chapter incorporates the general exceptions provided for in Article XX of the General Agreement on Tariffs and Trade 1994 to the goods trade-related provisions, specifying that nothing in the TPP shall be construed to prevent the adoption or enforcement by a Party of measures necessary to, among other things, protect public morals, protect human, animal or plant life or health, protect intellectual property, enforce measures relating to products of prison labour, and measures relating to conservation of exhaustible natural resources.</p> <p>The chapter also contains the similar general exceptions provided for in Article XIV of the General Agreement on Trade in Services with respect to the services trade-related provisions.</p> <p>The chapter includes a self-judging exception, applicable to the entire TPP, which makes clear that a Party may take any measure it considers necessary for the protection of its essential security interests. It also defines the circumstances and conditions under which a Party may impose temporary safeguard measures (such as capital controls) restricting transfers such as contributions to capital, transfers of profits and dividends, payments of interest or royalties, and payments under a contract related to covered investments, to ensure that governments retain the flexibility to manage volatile capital flows, in the contexts of balance of payments or other economic crises, or threats thereof. In addition, it specifies that no Party is obligated to furnish information under the TPP if it would be contrary to its law or public interest, or would prejudice the legitimate commercial interests of particular enterprises. A Party may elect to deny the benefits of Investor-State dispute settlement with respect to a claim challenging a tobacco control measure of the Party.</p>
30	Final Provisions	The Final Provisions chapter defines the way the TPP will enter into force, the way in which it can be amended, the rules that establish the process for other States or separate customs territories to join the TPP in the future, the means by which Parties can withdraw, and the authentic languages of the TPP. It also designates a Depositary for the Agreement responsible for receiving and disseminating documents.

No.	Chapter	Content
30		The chapter ensures that the TPP can be amended, with the agreement of all Parties and after each Party completes its applicable legal procedures and notifies the Depositary in writing. It specifies that the TPP is open to accession by members of the Asia-Pacific Economic Cooperation Forum and other States or separate customs territories as agreed by the Parties, again after completing applicable legal procedures in each Party. The Final Provisions chapter also specifies the procedures under which a Party can withdraw from the TPP.

Source: The US Trade Representative (10/2015)

Appendix 2. Viet Nam's Trade with TPP countries, 2007-2014

	Value (million USD)		Composition (%)	
	2007	2014	2007	2014
A. Exports				
Total export value	48561	150186	100.00	100.00
Exports to the TPP	24816	58407	51.10	38.89
Of which:				
The US	10105	28656	20.81	19.08
Canada	539	2081	1.11	1.39
Mexico	360	1037	0.74	0.69
Chile	47	522	0.10	0.35
Peru	17	187	0.03	0.12
New Zealand	68	316	0.14	0.21
Australia	3802	3990	7.83	2.66
Japan	6090	14704	12.54	9.79
Malaysia	1555	3931	3.20	2.62
Singapore	2234	2933	4.60	1.95
Brunei	-	50	-	0.03
B. Imports				
Total import value	62765	148049	100.00	100.00
Imports from TPP	19603	33985	31.23	22.96
Of which:				
The US	1701	6284	2.71	4.24
Canada	287	387	0.46	0.26
Mexico	59	265	0.09	0.18
Chile	110	368	0.18	0.25
Peru	48	98	0.08	0.07
New Zealand	246	478	0.39	0.32
Australia	1059	2058	1.69	1.39
Japan	6189	12909	9.86	8.72
Malaysia	2290	4193	3.65	2.83
Singapore	7614	6827	12.13	4.61
Brunei	-	118	-	0.08

Source: GSO (2015)

Appendix 2a. Composition of Viet Nam's Exports to the TPP members by HS 2-digit code, 2013 (%)

HS code	TPP countries												
	Malaysia	Singapore	Brunei	Japan	US	Canada	Chile	Peru	Mexico	New Zealand	Australia	%	Mil. USD
HS 85	23.28	8.49	0.01	30.52	24.99	1.93	0.12	0.20	2.15	1.29	7.03	100.00	7915.41
HS 61	0.24	0.28	0.00	14.19	80.70	3.30	0.16	0.04	0.56	0.08	0.46	100.00	6353.13
HS 27	18.15	6.86	0.01	37.66	9.02	0.00	0.00	0.00	0.00	0.00	28.30	100.00	5736.86
HS 62	0.37	0.38	0.00	24.64	68.42	3.48	0.42	0.08	0.95	0.14	1.12	100.00	5032.09
HS 64	0.97	0.88	0.00	10.55	70.80	4.29	2.09	0.93	6.11	0.48	2.90	100.00	3753.81
HS 84	3.76	10.73	0.03	18.17	51.49	5.31	0.44	0.36	3.13	0.80	5.78	100.00	3052.57
HS 94	0.48	0.96	0.03	17.44	70.79	4.07	0.06	0.06	0.15	0.79	5.16	100.00	2893.95
HS 03	2.47	3.66	0.06	34.66	42.56	6.34	0.25	0.32	4.79	0.55	4.35	100.00	2194.74
HS 16	0.67	1.63	0.00	33.65	50.54	3.89	0.01	0.00	0.05	0.59	8.98	100.00	1045.02
HS 42	0.51	0.69	0.00	19.28	73.09	3.02	0.31	0.10	0.71	0.34	1.95	100.00	1026.25

Source: Authors' calculation based on UN Comtrade Database

Appendix 2b. Composition of Viet Nam's Imports to the TPP members by HS 2-digit code, 2013 (%)

HS code	TPP countries												
	Malaysia	Singapore	Brunei	Japan	US	Canada	Chile	Peru	Mexico	New Zealand	Australia	%	Mil. USD
HS 85	16.55	32.20	0.00	38.57	11.63	0.26	0.00	0.00	0.55	0.04	0.19	100.00	6180.06
HS 27	19.85	58.59	16.80	2.01	0.48	0.02	0.00	0.00	0.00	0.00	2.25	100.00	3569.44
HS 84	9.82	6.80	0.01	66.30	14.92	0.55	0.01	0.00	0.51	0.24	0.85	100.00	3413.42
HS 72	2.36	1.57	0.00	75.00	8.62	1.34	1.34	0.00	0.12	0.93	8.73	100.00	2436.53
HS 39	18.37	15.15	0.00	50.88	14.59	0.50	0.00	0.00	0.06	0.07	0.38	100.00	1869.39
HS 90	6.19	4.46	0.00	48.97	36.22	1.95	0.00	0.00	0.98	0.12	1.10	100.00	751.30
HS 52	4.15	0.04	0.00	15.27	67.46	0.00	0.02	0.00	0.78	0.01	12.26	100.00	684.11
HS 73	5.95	7.47	0.00	73.43	11.23	0.41	0.01	0.00	0.20	0.02	1.28	100.00	649.50
HS 23	4.63	2.69	0.08	0.36	77.72	3.22	0.28	5.75	0.34	0.16	4.76	100.00	552.61
HS 10	0.02	0.00	0.00	0.01	8.53	8.78	0.00	0.00	0.00	0.00	82.67	100.00	535.20

Source: Authors' calculation based on UN Comtrade Database

Appendix 2c. Composition of Viet Nam's Exports to the AEC members by HS 2-digit code, 2013 (%)

HS code	Brunei	Cambodia	Indonesia	Laos	Malaysia	Philippines	Singapore	Thailand	Myanmar	AEC countries	
										%	Mil. USD
HS 85	0.02	1.94	16.21	0.54	38.58	8.31	14.07	20.02	0.31	100.00	4774.84
HS 27	0.01	27.90	4.86	4.09	35.49	2.18	13.41	12.06	0.00	100.00	2934.19
HS 72	0.00	28.69	21.81	5.31	13.68	12.48	1.86	15.39	0.78	100.00	1500.41
HS 84	0.09	5.45	14.24	1.54	12.79	9.31	36.45	18.37	1.76	100.00	898.18
HS 10	0.96	0.19	12.49	0.39	31.66	31.20	22.16	0.92	0.04	100.00	731.06
HS 40	0.09	3.45	6.65	0.64	81.21	1.56	1.24	4.14	1.02	100.00	677.83
HS 39	0.05	27.00	24.68	2.54	11.04	12.68	4.84	14.72	2.44	100.00	559.68
HS 87	0.00	11.79	12.04	7.46	11.12	9.65	0.88	45.69	1.36	100.00	511.36
HS 70	0.00	0.91	1.47	0.21	31.77	3.38	60.64	1.28	0.34	100.00	317.65
HS 25	0.59	8.17	41.57	5.57	17.08	18.39	4.29	1.45	2.88	100.00	308.88

Source: Authors' calculation based on UN Comtrade Database

Appendix 2d. Composition of Viet Nam's Imports to the AEC members by HS 2-digit code, 2013 (%)

HS code	Brunei	Cambodia	Indonesia	Laos	Malaysia	Philippines	Singapore	Thailand	Myanmar	AEC countries	
										%	Mil. USD
HS 85	0.00	0.08	5.04	0.08	24.02	10.83	46.75	13.12	0.06	100.00	4256.38
HS 27	14.51	0.00	3.86	0.49	17.15	0.02	50.61	12.87	0.49	100.00	4132.06
HS 84	0.01	0.04	8.43	0.04	18.09	1.85	12.53	59.00	0.00	100.00	1851.89
HS 39	0.00	0.09	8.97	0.11	23.15	2.11	19.09	46.47	0.00	100.00	1483.68
HS 44	0.00	6.49	2.00	61.64	11.64	0.30	0.14	8.95	8.85	100.00	745.76
HS 48	0.00	0.02	40.08	0.00	7.80	1.98	19.86	30.27	0.00	100.00	676.66
HS 15	0.00	0.00	17.39	0.00	76.64	0.04	0.28	5.64	0.00	100.00	600.94
HS 29	1.10	0.00	14.81	0.05	20.43	0.04	22.52	41.04	0.00	100.00	578.70
HS 87	0.00	0.02	16.63	0.00	1.94	1.77	0.45	79.20	0.00	100.00	502.35
HS 40	0.00	22.92	5.93	5.93	7.37	1.13	2.34	54.39	0.00	100.00	491.36

Source: Authors' calculation based on UN Comtrade Database

Appendix 3. Most Favored Nation tariff (MFN) (%) of Viet Nam after WTO entry and livestock tariff commitments (%) of Viet Nam in AANZFTA

HS subhdg	MFN Applied Tariff		Viet Nam's Tariff commitments AANZFTA													HS subheading 6-digit description	
	Average of AV/AV Duties	Minimum AV Duty	Maximum AV Duty	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	End day			
010121	0	0	0	0													Pure-bred breeding horses
010129	5	5	5														Live horses (excl. pure-bred for breeding)
010130	2.5	0	5														Live asses
010190	5	5	5	5	5	5	5	5	0					2016		Live mules and hinnies	
010221	0	0	0	0													Pure-bred cattle for breeding
010229	5	5	5														Live cattle (excl. pure-bred for breeding)
010231	0	0	0													Live bovine	Pure-bred buffalo for breeding
010239	5	5	5														Live buffalo (excl. pure-bred for breeding)
010290	2.5	0	5	5	5	5	5	5	0					2016		Live bovine animals (excl. cattle and buffalo)	
010310	0	0	0	0													Pure-bred breeding swine
010391	5	5	5	5	5	5	5	5	0					2016		Live pure-bred swine, weighing < 50 kg (excl. pure-bred for breeding)	
010392	5	5	5	5	5	5	5	5	0					2016		Live pure-bred swine, weighing >= 50 kg (excl. pure-bred for breeding)	
010410	2.5	0	5	2.5	2.5	2.5	2.5	2.5	0					2016		Live sheep	
010420	2.5	0	5	2.5	2.5	2.5	2.5	2.5	0					2016		Live goats	
010511	5	0	10	2.5	2.5	2.5	2.5	2.5	0					2016		Live fowls of the species Gallus domesticus, weighing <= 185 g (excl. turkeys and guinea fowls)	
010512	2.5	0	5	2.5	2.5	2.5	2.5	2.5	0					2016		Live domestic turkeys, weighing <= 185 g	
010513	2.5	0	5													Live domestic ducks, weighing <= 185 g	
010514	2.5	0	5													Live domestic geese, weighing <= 185 g	
010515	2.5	0	5													Live domestic guinea fowls, weighing <= 185 g	
010594	3.8	0	5													Live fowls of the species Gallus domesticus, weighing > 185	

HS subhdg	Viet Nam's Tariff commitments AANZFTA										HS subheading 6-digit description				
	MFN Applied Tariff		2011	2012	2013	2014	2015	2016	2017	2018		2019	2020	End day	
	Average of AV / Duties	Minimum AV Duty	Maximum AV Duty												
010599	2.5	0	5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	0	2016	Live poultry	Live domestic ducks, geese, turkeys and guinea fowls, weighing > 185 g
010611	5	5	5	5	5	5	5	5	5	5	5	0	2016	Other live animal	Live primates
010612	5	5	5	5	5	5	5	5	5	5	5	0	2016		Live whales, dolphins and porpoises (mammals of the order Cetacea); manatees and dugongs (mammals of the order Sirenia); seals, sea lions and walrus (mammals of the suborder Pinnipedia)
010613	5	5	5												Live camels and other camelids [Camelidae]
010614	5	5	5												Live rabbits and hares
010619	5	5	5	5	5	5	5	5	5	5	5	0	2016		Live mammals (excl. primates, whales, dolphins and porpoises, manatees and dugongs, seals, sea lions and walrus, camels and other camelids, rabbits and hares, horses, asses, mules, hinnies, bovines, pigs, sheep and goats)
010620	5	5	5	5	5	5	5	5	5	5	5	0	2016		Live reptiles "e.g. snakes, turtles, alligators, caymans, iguanas, gavials and lizards"
010631	5	5	5	5	5	5	5	5	5	5	5	0	2016		Live birds of prey
010632	5	5	5	5	5	5	5	5	5	5	5	0	2016		Live psittaciformes "incl. parrots, parakeets, macaws and cockatoos"
010633	5	5	5												Live ostriches, and emus [Dromaius novaehollandiae]
010639	5	5	5	5	5	5	5	5	5	5	5	0	2016		Live birds (excl. birds of prey, psittaciformes, parrots, parakeets, macaws, cockatoos, ostriches and emus)
010641	5	5	5												Live bees
010649	5	5	5												Live insects (excl. Bees)
010690	5	5	5	5	5	5	5	5	5	5	5	0	2016		Live animals (excl. mammals, reptiles, birds, insects, fish, crustaceans, molluscs and other aquatic invertebrates and cultures of micro-organisms, etc.)

HS subhdg	Viet Nam's Tariff commitments AANZFTA										HS subheading 6-digit description				
	MFN Applied Tariff		2011	2012	2013	2014	2015	2016	2017	2018		2019	2020	End day	
	Average of AV / Duties	Minimum AV Duty	Maximum AV Duty												
020110	30	30	30	15	10	10	7	7	5	5	0		2018	Bovine meat	Carcases or half-carcases of bovine animals, fresh or chilled
020120	20	20	20	15	10	10	7	7	5	5	0		2018		Fresh or chilled bovine cuts, with bone in (excl. carcasses and 1/2 carcasses)
020130	14	14	14	15	10	10	7	7	5	5	0		2018		Fresh or chilled bovine meat, boneless
020210	20	20	20	15	10	10	7	7	5	5	0		2018		Frozen bovine carcasses and half-carcasses
020220	20	20	20	15	10	10	7	7	5	5	0		2018		Frozen bovine cuts, with bone in (excl. carcasses and half-carcasses)
020230	14	14	14	15	10	10	7	7	5	5	0		2018		Frozen, boneless meat of bovine animals
020311	25	25	25	25	20	20	15	10	7	5	3	0	2020	Swine meat	Fresh or chilled carcasses and half-carcasses of swine
020312	25	25	25	25	20	20	15	10	7	5	3	0	2020		Fresh or chilled hams, shoulders and cuts thereof of swine, with bone in
020319	25	25	25	25	20	20	15	10	7	5	3	0	2020		Fresh or chilled meat of swine (excl. carcasses and half-carcasses, and hams, shoulders and cuts thereof, with bone in)
020321	15	15	15	25	20	20	15	10	7	5	3	0	2020		Frozen carcasses and half-carcasses of swine
020322	15	15	15	25	20	20	15	10	7	5	3	0	2020		Frozen hams, shoulders and cuts thereof of swine, with bone in
020329	15	15	15	25	20	20	15	10	7	5	3	0	2020		Frozen meat of swine (excl. carcasses and half-carcasses, and hams, shoulders and cuts thereof, with bone in)
020410	7	7	7	10	7	5	5	5	5	5	0		2016		Fresh or chilled lamb carcasses and half-carcasses
020421	7	7	7	10	7	5	5	5	5	5	0		2016		Fresh or chilled sheep carcasses and half-carcasses (excl. Lambs)
020422	7	7	7	10	7	5	5	5	5	5	0		2016		Fresh or chilled cuts of sheep, with bone in (excl. Carcasses and half-carcasses)
020423	7	7	7	10	7	5	5	5	5	5	0		2016	Other meat	Fresh or chilled boneless cuts of sheep
020430	7	7	7	10	7	5	5	5	5	5	0		2016		Frozen lamb carcasses and half-carcasses
020441	7	7	7	10	7	5	5	5	5	5	0		2016		Frozen sheep carcasses and half-carcasses (excl. Lambs)
020442	7	7	7	10	7	5	5	5	5	5	0		2016		Frozen cuts of sheep, with bone in (excl. Carcasses and half-carcasses)

HS subhdg	Viet Nam's Tariff commitments AANZFTA											MFN Applied Tariff	HS subheading 6-digit description
	Average of AV Duties	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020		
020443	7	10	7	5	5	5	5				2016	2016	Frozen boneless cuts of sheep
020450	7	10	7	5	5	5	5				2016	2016	Fresh, chilled or frozen meat of goats
020500	10	15	10	10	7	7	7	0			2017	2017	Meat of horses, asses, mules or hinnies, fresh, chilled or frozen
020610	8	10	10	10	7	5	5	5	0		2018	2018	Fresh or chilled edible offal of bovine animals
020621	8	10	10	10	7	5	5	5	0		2019	2019	Frozen edible bovine tongues
020622	8	10	10	10	7	5	5	5	0		2019	2019	Frozen edible bovine livers
020629	8	10	10	10	7	5	5	5	0		2018	2018	Frozen edible bovine offal (excl. tongues and livers)
020630	8	10	10	7	7	5	0				2016	2016	Fresh or chilled edible offal of swine
020641	8	10	10	7	7	5	0				2016	2016	Frozen edible livers of swine
020649	8	10	10	7	7	5	0				2016	2016	Edible offal of swine, frozen (excl. Livers)
020680	10	10	7	5	5	5	0				2016	2016	Fresh or chilled edible offal of sheep, goats, horses, asses, mules and hinnies
020690	10	10	7	5	5	5	5	4	0		2019	2019	Frozen edible offal of sheep, goats, horses, asses, mules and hinnies
020711	40	40	20	20	20	20	20	20	20	20	N/A	N/A	Fresh or chilled fowls of the species Gallus domesticus, not cut in pieces
020712	40	40	20	20	20	20	20	20	20	20	N/A	N/A	Frozen fowls of the species Gallus domesticus, not cut in pieces
020713	40	40	20	20	20	20	20	20	20	20	N/A	N/A	Fresh or chilled cuts and edible offal of fowls of the species Gallus domesticus
020714	20	20	17.5	17.5	16.8	16.8	16	16	16	15	N/A	N/A	Frozen cuts and edible offal of fowls of the species Gallus domesticus
020724	40	40	20	20	20	20	20	20	20	20	N/A	N/A	Fresh or chilled turkeys of the species domesticus, not cut in pieces
020725	40	40	20	20	20	20	20	20	20	20	N/A	N/A	Frozen turkeys of the species domesticus, not cut into pieces
020726	40	40	20	20	20	20	20	20	20	20	N/A	N/A	Fresh or chilled cuts and edible offal of turkeys of the species domesticus

HS subhdg	Viet Nam's Tariff commitments AANZFTA											MFN Applied Tariff	HS subheading 6-digit description
	Average of AV Duties	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020		
020727	20	18	15	15	13.5	13	13	13	12	10	N/A	N/A	Frozen cuts and edible offal of turkeys of the species domesticus
020741	40	40											Fresh or chilled domestic ducks, not cut in pieces
020742	40	40											Frozen domestic ducks, not cut in pieces
020743	15	15											Fatty livers of domestic ducks, fresh or chilled
020744	15	15											Fresh or chilled cuts and edible offal of domestic ducks (excl. fatty livers)
020745	15	15											Frozen cuts and edible offal of domestic ducks
020751	40	40											Fresh or chilled domestic geese, not cut in pieces
020752	40	40											Frozen domestic geese, not cut in pieces
020753	15	15											Fatty livers of domestic geese, fresh or chilled
020754	15	15											Fresh or chilled cuts and edible offal of domestic geese (excl. fatty livers)
020755	15	15											Frozen cuts and edible offal of domestic geese
020760	40	40											Meat and edible offal of domestic guinea fowls, fresh, chilled or frozen
020810	10	10	7	5	5	5	0				2016	2016	Fresh, chilled or frozen meat and edible offal of rabbits or hares
020830	10	10	7	5	5	5	0				2016	2016	Fresh, chilled or frozen meat and edible offal of primates
020840	7.5	5	7	5	5	5	0				2016	2016	Fresh, chilled or frozen meat and edible offal of whales, dolphins and porpoises (mammals of the order Cetacea), of manatees and dugongs (mammals of the order Sirenia) and of seals, sea lions and walrus (mammals of the suborder Pinnipedia)
020850	10	10	7	5	5	5	0				2016	2016	Fresh, chilled or frozen meat and edible offal of reptiles "e.g. snakes, turtles, crocodiles"
020860	5	5											Fresh, chilled or frozen meat and edible offal of camels and other camelids [Camelidae]

HS subhdg	MFN Applied Tariff			Viet Nam's Tariff commitments AANZFTA												HS subheading 6-digit description
	Average of AV Duties	Minimum AV Duty	Maximum AV Duty	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	End day		
020890	7.5	5	10	10	7	5	5	5	0					2016	Animal by-product	
020910	10	10	10	15	10	10	7	7	5	0				2017		
020990	10	10	10	15	10	10	7	7	5	0				2017		
021011	10	10	10	15	10	10	7	7	5	0				2017		
021012	10	10	10	15	10	10	7	7	5	0				2017		
021019	10	10	10	15	10	10	7	7	5	0				2017		
021020	15	15	15	15	10	10	7	7	5	0				2017	Process ed meat	
021091	20	20	20	15	10	10	7	7	5	0				2017		
021092	20	20	20	15	10	10	7	7	5	0				2017		

HS subhdg	MFN Applied Tariff			Viet Nam's Tariff commitments AANZFTA												HS subheading 6-digit description
	Average of AV Duties	Minimum AV Duty	Maximum AV Duty	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	End day		
021093	20	20	20	15	10	10	7	7	5	0				2017	Meat and edible offal, salted, in brine, dried or smoked, and edible flours and meals of meat and meat offal, of reptiles "e.g. snakes, turtles, alligators"	
021099	20	20	20	15	10	10	7	7	5	0				2017	Process ed meat	
040110	15	15	15	15	10	10	7	7	5	5	5	0		2019	Milk and cream of a fat content by weight of <= 1%, not concentrated nor containing added sugar or other sweetening matter	
040120	15	15	15	15	10	10	7	7	5	0				2017	Milk and cream of a fat content by weight of > 1% but <= 6%, not concentrated nor containing added sugar or other sweetening matter	
040130	15	15	15	15	10	10	7	7	5	0				2017	Milk and cream, not concentrated, not containing added sugar or other sweetening matter, of a fat content exceeding 6% (by weight). Of a fat content, by weight, exceeding 6%	
040150	15	15	15	15	10	10	7	7	5	0				2017	Milk and cream of a fat content by weight of > 10%, not concentrated nor containing added sugar or other sweetening matter	
040210	4	3	5	5										2020	Milk and cream in solid forms, of a fat content by weight of <= 1,5%	
040221	3	3	3	3											Milk powder	
040229	5	5	5	25	20	20	15	10	7	5	5	15	0	2020	Milk and cream in solid forms, of a fat content by weight of > 1,5%, sweetened	
040291	10	10	10	10	10	10	7	5	5	5	5	0		2019	Milk and cream, concentrated but unsweetened (excl. in solid forms)	

HS subhdg	MFN Applied Tariff			Viet Nam's Tariff commitments AANZFTA												HS subheading 6-digit description
	Average of AV AV Duties	Minimum AV Duty	Maximum AV Duty	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	End day		
040299	20	20	20	25	20	20	15	10	7	5	5	0		2019	Milk and cream, concentrated and sweetened (excl. in solid forms)	
040310	7	7	7	25	20	20	15	10	7	0				2017	Yogurt, whether or not flavoured or containing added sugar or other sweetening matter, fruits, nuts or cocoa	
040390	5	3	7	25	20	20	15	10	7	5	5	0		2019	Buttermilk, curdled milk and cream, kephir and other fermented or acidified milk and cream, whether or not concentrated or flavoured or containing added sugar or other sweetening matter, fruits, nuts or cocoa (excl. Yogurt)	
040410	0	0	0	20	15.5	15.5	11	8.5	6	2.5	0			2018	Whey and modified whey, whether or not concentrated or containing added sugar or other sweetening matter	
040490	0	0	0	25	20	20	15	10	7	5	5	0		2019	Products consisting of natural milk constituents, whether or not sweetened, n.e.s.	
040510	13	13	13	15	10	10	7	7	5	0				2017	Butter (excl. dehydrated butter and ghee)	
040520	15	15	15	15	10	10	7	7	5	5	5	0		2019	Dairy spreads of a fat content, by weight, of >= 39% but < 80%	
040590	10	5	15	10	10	10	6	6	3.8	3.8	3.5	2.3	0	2020	Fats and oils derived from milk, and dehydrated butter and ghee (excl. natural butter, recombined butter and whey butter)	
040610	10	10	10	10	7	5	5	5	5	5	4	0		2019	Fresh cheese "unripened or uncurd cheese", incl. whey cheese, and curd	
040620	10	10	10	10	7	5	5	5	2.5	0				2017	Grated or powdered cheese	
040630	10	10	10	10	7	5	5	5	5	0				2017	Processed cheese, not grated or powdered	
040640	10	10	10	10	7	5	5	5	5	5	4	3	0	2020	Blue-veined cheese and other cheese containing veins produced by "Penicillium roqueforti"	
040690	10	10	10	10	7	5	5	5	5	0				2017	Cheese (excl. fresh cheese, incl. whey cheese, curd, processed cheese, blue-veined cheese and other cheese containing veins produced by "Penicillium roqueforti", and grated or powdered cheese)	

Appendix 4a. Regional Aggregation

No.	Regions	GTAP 140 regions
1	VietNam	Viet Nam.
2	Australia	Australia.
3	NewZealand	New Zealand.
4	Japan	Japan.
5	Brunei	Brunei Darassalam.
6	Malaysia	Malaysia.
7	Singapore	Singapore.
8	Canada	Canada.
9	US	United States of America.
10	Mexico	Mexico.
11	Chile	Chile.
12	Peru	Peru.
13	Cambodia	Cambodia.
14	Indonesia	Indonesia.
15	Laos	Lao People's Democratic Republic.
16	Philippines	Philippines.
17	Thailand	Thailand.
18	RoSEAsia	Rest of Southeast Asia.
19	China	China; Hong Kong.
20	Korea	Korea.
21	India	India.
22	EU 25	Austria; Belgium; Cyprus; Czech Republic; Denmark; Estonia; Finland; France; Germany; Greece; Hungary; Ireland; Italy; Latvia; Lithuania; Luxembourg; Malta; Netherlands; Poland; Portugal; Slovakia; Slovenia; Spain; Sweden; United Kingdom.
23	RestofWorld	Rest of the World.

Source: GTAP Database version 9

Appendix 4b. Sector Aggregation

No.	Sectors	GTAP 57 Sectors
1	Rice	Paddy rice; Processed rice.
2	OthCrops	Wheat; Cereal grains n.e.c.; Vegetables, fruit, nuts; Oil seeds; Sugar cane, sugar beet; Plant-based fibers; Crops n.e.c.
3	Cattle	Cattle, sheep, goats, horses.
4	OAP	Animal products n.e.c.
5	CMT	Meat: cattle, sheep, goats, horse.
6	OMT	Meat products n.e.c.
7	RawMilk	Raw milk.
8	Dairy	Dairy products.
9	Forestry	Forestry.
10	Fishing	Fishing.
11	CMOG	Coal; Oil; Gas; Minerals n.e.c.
12	ProcFood	Vegetable oils and fats; Sugar; Food products n.e.c.; Beverages and tobacco products.
13	Textiles	Textiles.
14	Apparel	Wearing apparel.
15	LSMnfc	Wool, silk-worm cocoons; Leather products.
16	WoodProducts	Wood products; Paper products, publishing.
17	MProc	Petroleum, coal products; Chemical, rubber, plastic prods; Mineral products n.e.c.; Ferrous metals; Metals n.e.c.; Metal products.
18	ElecEquip	Electronic equipment.
19	OthMnfc	Motor vehicles and parts; Transport equipment n.e.c.; Machinery and equipment n.e.c.; Manufactures n.e.c.
20	Util_Cons	Electricity; Gas manufacture, distribution; Water; Construction.
21	TransComm	Trade; Transport n.e.c.; Sea transport; Air transport; Communication.
22	OthServices	Financial services n.e.c.; Insurance; Business services n.e.c.; Recreation and other services; PubAdmin / Defence / Health/Educat; Dwellings.

Source: GTAP Database version 9

Appendix 5: Nominal GDP and its Expenditure Components in 2011

	GDP (US\$, billion)	%GDP				
		C	I	G	EXP	IMP
VietNam	136	80	31	7	72	-90
Australia	1387	54	27	18	20	-19
NewZealand	164	59	19	20	29	-27
Japan	5906	60	20	20	16	-16
Brunei	17	28	20	26	57	-30
Malaysia	289	51	24	14	85	-75
Singapore	274	39	27	10	119	-96
Canada	1779	55	23	21	27	-27
US	15534	70	19	17	12	-17
Mexico	1170	65	21	11	30	-28
Chile	251	61	22	12	37	-32
Peru	171	60	24	10	29	-23
Cambodia	13	85	16	6	76	-83
Indonesia	846	58	32	9	24	-24
Laos	8	72	27	10	38	-48
Philippines	224	78	20	10	31	-39
Thailand	346	57	27	14	73	-71
RoSEAsia	56	63	30	13	16	-22
China	7570	37	45	13	28	-24
Korea	1202	53	31	14	51	-49
India	1880	62	34	12	20	-28
EU 25	17369	60	19	22	39	-40
RestofWorld	14886	58	22	16	33	-28

Source: Authors' calculation from GTAP Database version 9

Appendix 6. Average applied tariffs

	Viet Nam	Australia	New Zealand	Japan	Brunei	Malaysia	Singapore	Canada	US	Mexico	Chile	Peru	Cambodia	Indonesia	Laos	Philippines	Thailand	RoSE Asia	China	Korea	India	EU 25	Rest of World
Viet Nam	..	0.1	2.5	0.8	0.3	7.2	0.0	6.3	7.0	18.2	5.4	5.1	11.9	2.8	2.8	14.0	8.8	2.8	1.2	8.9	12.0	4.0	7.7
Australia	3.6	..	0.0	2.6	1.5	1.8	0.0	0.4	0.5	2.1	5.1	0.5	9.2	4.3	7.8	1.3	2.8	1.4	1.5	4.0	4.8	1.5	3.4
New Zealand	4.4	0.0	..	8.5	1.0	2.4	0.0	15.8	2.1	19.1	0.7	0.3	11.6	4.1	5.9	0.8	8.3	3.0	2.6	16.8	7.9	14.6	11.4
Japan	5.4	10.5	4.1	..	7.8	8.4	0.0	2.5	1.1	3.1	0.4	2.1	10.2	7.3	17.5	2.0	8.5	9.9	6.1	4.6	7.2	2.6	5.8
Brunei	0.3	0.0	0.0	0.0	..	1.1	0.0	0.1	0.5	0.2	0.0	0.1	10.3	0.0	0.0	0.0	0.0	0.6	0.0	2.3	0.0	0.0	0.2
Malaysia	2.6	0.2	1.0	0.4	2.8	..	0.0	1.0	0.8	4.6	4.1	2.3	11.1	0.4	3.3	0.1	6.0	1.8	1.7	1.8	19.7	0.6	6.5
Singapore	7.1	0.0	0.0	0.0	12.7	1.9	..	0.2	0.0	3.2	1.2	0.2	14.1	3.2	16.7	1.8	7.0	4.5	2.0	1.7	3.8	0.0	6.6
Canada	2.7	1.5	0.1	7.6	0.6	1.1	0.0	..	0.1	0.4	0.5	1.4	4.0	3.2	4.4	6.4	4.8	0.7	2.2	3.7	10.7	1.0	4.0
US	4.5	0.7	1.3	4.1	3.4	2.9	0.0	1.0	..	0.2	0.1	1.1	11.4	3.4	7.2	3.1	4.1	1.4	4.3	21.7	5.5	1.3	4.1
Mexico	3.3	4.0	1.9	6.5	2.3	3.4	0.2	0.1	0.0	..	0.0	2.4	2.2	2.4	0.3	2.1	6.3	1.9	3.4	3.2	2.3	0.1	2.9
Chile	4.0	0.0	0.1	1.6	0.0	1.7	0.0	1.0	0.5	1.1	..	0.2	8.4	1.9	7.8	3.0	2.6	1.1	0.2	1.6	2.2	0.9	1.7
Peru	1.7	0.7	0.8	0.3	0.0	1.4	0.0	0.0	0.1	3.5	0.4	..	1.5	3.8	0.0	2.8	1.4	0.6	0.5	1.2	3.2	0.1	0.6
Cambodia	3.6	0.0	0.0	0.2	0.1	5.6	0.0	0.0	11.8	23.3	4.7	8.9	..	0.0	21.9	0.0	13.5	0.5	1.3	4.2	17.8	0.0	6.1
Indonesia	3.6	1.7	1.7	0.3	5.1	1.5	0.0	3.3	4.2	10.9	5.4	3.7	7.4	..	4.1	0.0	7.8	2.1	1.2	1.7	33.7	2.3	6.2
Laos	0.6	0.0	0.0	0.5	0.0	0.0	0.0	0.0	3.2	2.4	0.0	2.5	12.6	0.0	..	0.0	4.0	1.8	0.3	1.8	0.1	0.0	1.0
Philippines	3.2	0.1	0.9	1.4	3.3	2.9	0.0	2.1	2.3	4.5	4.7	2.2	8.0	0.4	2.8	..	11.0	1.7	0.2	4.4	4.9	0.8	2.4
Thailand	4.0	0.0	1.2	4.3	4.8	1.6	0.0	2.6	1.4	8.6	5.4	1.5	14.2	1.3	6.6	1.5	..	3.7	1.7	7.2	7.7	2.4	7.2
RoSE Asia	0.7	0.0	0.0	1.0	2.1	0.3	0.0	0.7	0.5	16.5	3.1	3.7	6.1	0.3	5.1	3.6	0.5	3.1	1.0	17.3	9.1	4.9	5.6
China	7.4	3.1	3.5	2.7	3.4	3.8	0.0	3.3	2.8	6.4	1.6	3.3	10.1	1.2	10.8	1.0	7.0	4.4	..	5.6	6.7	3.4	8.6
Korea	7.6	9.7	2.8	1.5	1.8	6.8	0.0	2.2	1.0	7.7	0.9	2.5	11.3	1.3	26.0	1.6	5.6	4.0	5.0	..	6.9	0.9	8.6
India	7.9	3.3	1.9	0.7	3.4	3.7	0.0	2.4	1.4	10.4	4.4	3.4	7.4	3.5	6.9	6.1	7.7	3.0	1.5	8.3	..	1.5	6.1
EU 25	4.2	4.3	1.8	2.5	2.2	4.0	0.0	1.9	0.9	0.3	0.0	1.1	5.2	3.3	7.1	3.0	4.8	1.5	6.3	4.9	6.5	0.0	4.0
RestofWorld	5.1	1.2	0.7	0.4	0.7	3.9	0.0	1.2	0.7	4.1	1.3	0.6	7.4	2.6	4.2	1.6	1.5	2.2	2.0	4.5	3.4	0.5	3.4

Source: Authors' calculation from GTAP Database version 9

Appendix 7a. Change in Export from Viet Nam by region and commodity, scenario b

	Australia	New Zealand	Japan	Brunei	Malaysia	Singapore	Canada	US	Mexico	Chile	Peru	Cambodia	Indonesia	Laos	Philippines	Thailand	RoSE Asia	China	Korea	India	EU 25	Rest of World	
Rice	-1.4	-0.2	-1.3	-2.9	395.0	-4.6	-0.5	-1.1	-0.1	0.0	0.0	0.0	-0.4	-173.5	-0.4	-84.3	-0.1	0.0	-30.9	-2.2	-0.1	-10.2	-289.7
OthCrops	-8.1	-0.8	-57.6	0.0	-17.0	-1.3	-6.0	-78.7	23.0	1.3	0.0	0.0	-1.0	-7.8	-1.1	-6.9	-8.1	0.0	-83.8	-9.5	-12.4	-185.0	-87.9
Cattle	0.0	0.0	-0.1	0.0	0.0	0.0	0.0	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	0.0	0.0	-0.4	-0.2
OAP	0.0	0.0	-2.1	0.0	0.0	-0.2	-0.2	-1.7	0.1	0.0	0.0	0.0	-0.1	0.0	0.0	0.0	-0.4	0.0	-0.8	-0.1	-0.1	-2.0	-4.0
CMT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1
OMT	0.0	0.0	-0.1	0.0	-0.3	0.0	-1.3	0.0	0.0	0.0	0.0	0.0	-0.5	-0.1	0.0	-0.2	-0.2	0.0	-22.6	-0.8	0.0	-1.8	-4.5
RawMilk	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dairy	-0.1	0.0	-0.2	0.0	0.0	-0.1	10.4	-0.2	0.0	0.0	0.0	0.0	-3.2	0.0	0.0	-0.2	0.0	-1.8	-0.1	-0.1	0.0	-0.7	-10.8
Forestry	0.0	0.0	-0.2	0.0	-0.1	0.0	0.0	-0.1	0.0	0.0	0.0	0.0	0.0	-0.1	0.0	0.0	-0.2	0.0	-7.7	-0.5	-1.1	-0.2	-1.0
Fishing	-0.1	0.0	-2.3	0.0	-0.2	-0.8	-0.2	-6.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.4	0.0	-3.1	-0.4	-0.1	-2.4	-1.7
CMOG	-105.1	-1.6	-102.4	0.0	117.5	-107.9	0.0	-26.8	0.0	0.0	0.0	0.0	0.0	-4.0	-0.4	-1.4	-18.6	0.0	-163.1	-70.1	-6.1	-2.7	-4.6
ProFood	-29.8	-2.0	-142.3	-1.6	8.3	-11.6	-45.6	-147.5	70.7	0.5	-1.1	-26.8	-8.8	-2.2	-14.3	-35.7	-0.5	-91.6	-105.4	-5.8	-269.1	-234.2	-284.8
Textiles	-3.5	1.4	-113.9	0.0	-12.1	-1.0	112.1	1466.0	64.4	1.7	0.7	-29.3	-36.6	-2.5	-11.1	-30.4	-1.3	-145.6	-119.7	-11.0	-142.1	-214.6	-214.6
Apparel	5.8	6.1	-173.9	0.0	-2.6	-1.6	328.5	5253.5	358.8	5.6	6.6	-0.2	-1.0	-0.2	-0.9	-1.4	0.0	-21.0	-107.4	-0.4	-337.4	-89.7	-89.7
LSMnfc	-17.5	7.9	143.5	0.0	-6.8	-8.2	134.6	3319.2	657.9	16.9	19.5	-8.6	-25.3	-0.3	-4.5	-6.7	0.0	-94.9	-44.4	-7.6	-658.6	-284.8	-284.8
Wood Products	-33.8	-0.7	-190.5	0.0	-13.6	-6.1	-4.4	-547.7	10.9	0.3	0.1	-6.4	-3.2	-1.7	-3.5	-3.6	-0.2	-144.4	-57.6	-9.2	-273.2	-82.8	-82.8
MProc	-28.8	-0.6	-228.7	-0.4	-171.1	-23.3	-14.8	-132.1	12.7	1.9	-3.1	-176.7	-89.1	-19.7	-46.8	-94.8	-11.5	-215.5	-102.9	-95.5	-329.5	-350.8	-350.8
ElecEquip	-40.3	-3.0	-64.2	0.0	-38.0	-3.2	-3.3	-87.5	-2.2	1.2	-0.4	-8.7	-36.2	-0.2	-29.8	-54.5	-0.6	-278.7	-34.8	-83.5	-614.8	-317.4	-317.4
OthMnfc	-61.6	-1.2	-497.0	-0.3	-46.1	-25.1	-15.3	-247.0	44.5	3.4	0.3	-22.5	-41.0	-8.2	-58.8	-85.6	-2.0	-244.0	-83.3	-43.7	-326.5	-346.4	-346.4
Util_Con	-0.2	-0.1	-7.7	-0.1	-1.4	-0.7	-1.7	-3.5	-0.1	-0.1	-0.1	-0.2	-0.8	-0.1	0.0	-2.0	0.0	-6.1	-2.3	-1.6	-48.9	-43.2	-43.2
TransComm	-5.8	-1.3	-16.5	-0.2	-2.1	-9.6	-9.1	-48.4	-1.8	-1.6	-0.3	-0.1	-3.4	0.0	-0.7	4.3	0.0	-27.1	-15.7	-6.8	-220.1	-82.2	-82.2
OthServices	-8.6	-1.9	-27.7	-0.5	-7.0	-15.6	-25.5	-182.6	-4.7	-1.6	-0.8	-0.1	-5.3	-0.1	-1.4	-7.0	-0.4	-32.8	-15.7	-20.6	-435.6	-189.8	-189.8

Source: Authors' calculation from GTAP Database version 9

Appendix 7b. Change in Import to Viet Nam by region and commodity, scenario b

	Australia	New Zealand	Japan	Brunei	Malaysia	Singapore	Canada	US	Mexico	Chile	Peru	Camodia	Indonesia	Laos	Philippines	Thailand	RoSE Asia	China	Korea	India	EU 25	Rest of World
Rice	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.2	0.0	0.1	0.1	0.8	0.0	7.3	0.0	1.3	0.0	0.1
OthCrops	35.2	2.9	2.6	0.0	0.8	-0.6	2.7	33.4	0.0	4.7	3.3	6.5	2.3	1.5	0.3	8.6	1.3	26.0	0.1	18.4	1.2	31.5
Cattle	0.2	1.6	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.1
OAP	0.1	0.1	2.1	0.0	0.3	0.0	0.5	4.6	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.5	0.1	2.1	1.8	0.0	1.0	2.7
CMT	13.7	2.2	0.1	0.0	0.1	0.1	3.0	11.2	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-65.2	-1.0	-1.2
OMT	-3.5	-0.8	1.6	0.0	0.4	0.2	29.7	182.7	0.4	-1.0	0.5	0.0	-0.1	0.0	0.0	-1.4	0.0	-2.4	-4.9	-2.2	-22.1	-33.3
RawMilk	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dairy	10.2	42.9	0.1	0.0	0.6	5.4	3.7	39.7	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.0	0.0	0.0	0.0	0.7	0.1
Forestry	0.0	-0.2	0.0	0.0	-2.5	0.1	0.0	-1.3	0.0	0.1	0.0	0.0	0.0	-3.4	0.0	0.0	-2.1	0.0	0.0	0.0	-0.7	-7.3
Fishing	0.9	0.0	0.3	0.0	0.0	0.1	0.0	0.3	0.0	0.0	0.0	0.0	0.6	0.0	0.1	0.2	0.0	0.2	0.0	1.4	0.0	3.4
CMOG	10.2	1.2	2.0	0.0	0.9	1.2	0.1	3.7	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.2	0.0	0.1	0.0	0.0	0.0	-0.1
ProcFood	247.6	10.5	122.4	0.0	139.3	232.3	25.1	251.7	6.9	63.4	-1.1	0.0	-17.8	0.0	-3.7	-13.2	-0.1	-46.4	-8.2	-38.7	-21.1	-54.0
Textiles	6.6	15.1	918.4	0.8	97.1	3.8	3.0	82.7	2.3	0.6	0.2	0.2	33.7	0.2	0.6	107.4	0.3	1132.1	408.0	35.7	47.3	394.1
Apparel	1.1	1.3	102.4	0.0	1.7	2.3	1.2	14.7	2.9	0.1	0.6	0.1	0.5	0.0	0.3	3.6	0.0	187.2	39.5	0.2	7.3	14.1
LSMnfc	9.1	0.4	42.7	0.0	5.0	7.7	0.9	85.1	0.9	0.0	0.0	0.5	7.0	0.0	0.2	36.7	0.0	104.8	51.6	23.2	49.4	149.3
Wood Products	3.8	0.1	125.0	0.0	12.8	186.9	2.0	25.9	0.9	-0.1	0.0	-0.5	-8.9	-4.8	-0.9	-6.5	0.0	-21.0	-7.3	-0.7	-5.9	-11.4
MProc	198.6	1.6	1070.7	-0.9	199.9	1789.9	12.1	285.6	4.1	-12.6	0.3	-9.5	-24.2	-3.0	-12.5	-95.0	-0.3	-417.0	-205.6	-23.8	-81.7	-340.2
ElecEquip	2.1	0.1	25.1	0.0	83.3	-3.9	1.4	46.7	7.3	0.6	0.0	0.0	0.3	0.0	-0.4	0.4	0.0	-10.4	-14.4	0.0	-0.5	-1.3
OthMnfc	18.1	0.4	1984.0	0.0	73.7	650.0	19.4	1060.1	4.4	0.5	0.0	-0.1	-7.5	-0.1	-4.4	-44.6	0.0	-202.8	-104.4	-6.3	-113.5	-58.4
Util_Con	0.3	0.0	27.4	0.1	4.5	2.0	1.2	16.3	2.3	0.0	0.0	0.0	0.8	0.0	0.2	0.9	0.0	47.8	15.4	1.3	75.6	21.1
TransComm	10.0	2.1	23.4	0.2	6.8	15.4	13.1	68.9	4.5	2.6	1.1	0.4	2.4	0.1	1.7	7.2	0.1	46.9	5.0	6.3	201.0	87.2
OthServices	11.7	2.0	20.3	0.3	6.4	27.1	32.3	219.1	6.3	1.6	0.8	0.2	1.0	0.0	1.4	3.0	0.1	28.2	9.2	33.7	363.5	102.8

Source: Authors' calculation from GTAP Database version 9

Appendix 7c. Change in Export from Viet Nam by region and commodity, scenario e

	Australia	New Zealand	Japan	Brunei	Malaysia	Singapore	Canada	US	Mexico	Chile	Peru	Camodia	Indonesia	Laos	Philippines	Thailand	RoSE Asia	China	Korea	India	EU 25	Rest of World
Rice	-1.1	-0.1	-0.3	-1.7	184.8	-1.0	-0.4	-3.0	-0.1	0.0	0.0	0.4	76.1	0.2	651.6	1.0	0.0	-19.6	-1.7	-0.1	-7.1	-204.3
OthCrops	-10.6	-1.5	-14.6	0.0	-29.2	-0.6	-5.8	-81.0	-2.4	-0.6	0.0	4.8	-6.3	0.1	-1.7	172.7	0.0	-68.5	-9.6	-9.6	-139.8	-69.3
Cattle	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.3	-0.1
OAP	0.0	0.0	-0.6	0.0	0.0	0.0	-0.1	-3.1	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.5	0.0	-0.5	-0.1	0.0	-1.0	-2.1
CMT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	-0.1
OMT	0.0	0.0	0.0	0.0	-0.1	0.0	-0.2	-0.2	0.0	0.0	0.0	-0.5	0.0	0.0	0.0	0.5	0.0	-9.3	-0.3	0.0	-0.7	-1.9
RawMilk	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dairy	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	0.0	0.0	0.0	0.6	0.0	0.0	-0.1	0.4	0.0	-0.7	0.0	0.0	-0.2	-3.5
Forestry	0.0	0.0	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	-1.9	-0.1	-0.3	0.0	-0.2
Fishing	0.0	0.0	-0.9	0.0	0.0	0.0	-0.1	-1.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	-0.7	-0.1	0.0	-0.6	-0.4
CMOG	-54.1	-0.7	-60.5	0.0	149.3	17.4	0.0	-16.2	0.0	0.0	0.0	0.0	-2.2	1.0	-0.7	-3.5	0.0	-92.1	-39.0	-3.3	-1.5	-2.5
ProcFood	-9.6	-0.9	-58.0	-1.5	31.4	-0.5	-8.3	-61.6	-5.4	-0.5	-0.3	14.3	4.6	2.8	4.1	132.7	0.2	-27.2	-31.1	-1.6	-78.0	-68.7
Textiles	-1.6	-0.3	-32.9	0.0	-2.1	0.0	-4.6	-115.6	-1.1	-0.4	-0.2	82.9	-3.6	0.0	-2.1	45.4	2.4	-38.2	-33.7	-2.8	-37.0	-55.1
Apparel	-1.6	-0.3	-51.1	0.0	-0.5	0.0	-7.8	-174.2	-3.3	-0.6	-0.2	6.1	-0.2	0.2	0.1	26.7	0.0	-5.3	-27.3	-0.1	-81.7	-22.1
LSMnfc	-3.9	-0.8	-20.3	0.0	-0.6	-0.5	-6.8	-117.0	-9.4	-3.3	-0.9	18.4	4.2	0.0	-0.2	77.9	0.0	-20.6	-9.5	-1.7	-182.3	-60.9
Wood Products	-9.3	-1.2	-48.7	0.0	1.6	-0.1	-7.7	-143.7	-0.8	-0.2	-0.1	13.6	-0.2	0.9	-0.4	8.1	0.3	-35.8	-14.0	-2.2	-67.1	-20.2
MProc	-6.2	-0.8	-56.9	0.0	2.0	2.1	-4.8	-54.9	-1.9	-0.6	-0.9	134.3	-14.5	-1.9	-2.7	225.2	3.7	-46.3	-23.1	-20.3	-71.0	-75.6
ElecEquip	-6.4	-0.5	-11.3	0.0	-0.2	-0.5	-0.5	-15.0	-1.4	-0.1	-0.1	29.9	5.5	0.1	-5.2	1.2	0.6	-36.5	4.4	-10.6	-87.8	-45.4
OthMnfc	-6.9	-0.8	-118.1	-0.1	-0.1	0.2	-6.1	-78.7	-5.5	-0.6	-0.6	85.5	-8.6	-10.3	10.2	510.3	1.1	-47.2	-16.4	-8.0	-60.1	-64.7
Util_Con	-0.1	0.0	-2.7	0.0	0.3	-0.1	-0.5	-1.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.7	0.0	-1.6	-0.6	-0.4	-12.8	-11.3
TransComm	-1.8	-0.4	-5.3	0.0	0.4	-2.0	-2.6	-12.6	-0.6	-0.5	-0.1	0.0	1.2	0.0	0.3	1.3	0.0	-6.8	4.0	-1.7	-54.9	-20.6
OthServices	-2.8	-0.6	-9.3	-0.1	-0.4	-4.0	-8.1	-54.7	-1.6	-0.5	-0.3	0.0	0.6	0.0	0.1	0.3	-0.1	-9.5	-4.7	-5.9	-127.5	-55.7

Source: Authors' calculation from GTAP Database version 9

Appendix 7d. Change in Import to Viet Nam by region and commodity, scenario e

	Australia	New Zealand	Japan	Brunei	Malaysia	Singapore	Canada	US	Mexico	Chile	Peru	Cambodia	Indonesia	Laos	Philippines	Thailand	RoSE Asia	China	Korea	India	EU 25	Rest of World
Rice	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.2	0.3	1.4	0.1	6.7	0.0	1.2	0.0	0.1
OthCrops	2.6	0.0	0.0	0.0	0.8	-2.0	0.0	0.5	0.0	0.0	0.0	3.4	9.2	7.9	9.8	11.9	1.5	1.1	0.0	2.4	0.0	0.7
Cattle	0.1	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
OAP	0.1	0.1	0.4	0.0	0.3	0.0	0.2	2.0	0.0	0.0	0.0	0.0	0.1	0.2	0.0	0.4	0.0	0.8	0.8	0.0	0.4	1.1
CMT	-0.2	0.0	0.0	0.0	0.1	0.1	0.0	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-9.1	-0.2	-0.2
OMT	0.4	0.1	0.0	0.0	1.6	0.4	0.3	3.6	0.0	0.3	0.1	0.0	0.1	0.0	0.1	2.8	0.1	0.2	0.4	0.2	1.8	2.8
RawMilk	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dairy	0.4	3.7	0.0	0.0	0.7	5.3	0.1	3.8	0.0	0.0	0.0	0.0	0.1	0.0	1.8	4.0	0.0	0.0	0.0	0.0	1.9	0.3
Forestry	0.0	0.0	0.0	0.0	-0.8	0.1	0.0	-0.1	0.0	0.0	0.0	0.0	0.2	-6.0	0.0	0.0	-0.5	0.0	0.0	0.0	-0.1	-1.0
Fishing	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.4
CMOG	0.4	0.0	0.1	0.0	0.9	0.8	0.0	0.2	0.0	0.0	0.0	0.2	0.1	1.0	0.0	1.8	0.0	1.7	0.0	0.4	0.6	0.8
ProcFood	-5.6	-0.6	-6.8	0.0	151.1	222.3	-2.6	-19.6	-0.5	-3.1	-3.5	3.7	109.3	0.0	40.1	72.7	0.2	-57.6	-7.8	-46.9	-25.7	-64.7
Textiles	-0.1	-0.3	-22.3	0.4	35.2	-0.4	-0.1	-2.3	-0.1	0.0	0.0	0.4	27.2	0.3	0.7	80.2	0.5	-162.4	-63.6	-5.0	-7.2	-60.0
Apparel	0.0	-0.1	0.0	0.0	1.0	1.7	0.0	0.0	0.0	0.0	0.0	0.1	0.9	0.0	0.6	5.2	0.1	-2.2	-0.6	0.0	-0.1	-0.3
LSMnfc	-0.6	0.0	-0.4	0.0	2.0	4.9	-0.1	-5.1	0.0	0.0	0.0	0.7	5.8	0.0	0.1	36.1	0.0	-12.9	-6.4	-2.8	-6.6	-19.6
Wood Products	-0.6	-4.8	-7.9	0.0	11.2	167.6	-0.5	-13.7	0.0	-1.4	0.0	0.0	17.3	-18.5	2.5	20.8	0.0	-31.8	-10.2	-1.0	-9.3	-17.7
MProc	-56.1	-1.4	-186.2	-1.2	144.0	1579.9	-8.6	-68.0	-1.3	-14.0	-0.1	87.0	53.5	-0.3	5.2	795.7	0.1	-576.8	-264.5	-32.9	-115.1	-471.5
ElecEquip	0.0	0.0	7.9	0.0	83.7	-25.5	0.0	1.8	0.1	0.0	0.0	0.0	30.9	0.0	3.7	11.7	0.1	12.6	13.7	0.0	0.5	1.1
OthMnfc	-1.5	-0.4	-104.9	0.0	59.3	588.8	-1.6	-32.3	-0.3	-0.1	0.0	0.9	160.9	1.9	39.6	871.7	0.5	-191.1	-87.9	-6.2	-112.0	-56.6
Util_Con	0.0	0.0	4.3	0.1	2.0	0.7	0.2	2.3	0.3	0.0	0.0	0.0	0.5	0.0	0.1	0.6	0.0	10.7	3.5	0.3	16.6	4.6
TransComm	1.3	0.3	3.3	0.1	3.3	5.3	1.4	8.4	0.5	0.3	0.1	0.3	1.9	0.0	1.2	3.8	0.1	9.8	1.1	1.3	40.7	17.7
OthServices	1.8	0.4	3.5	0.1	3.2	9.3	4.4	32.5	0.9	0.2	0.1	0.1	0.7	0.0	0.8	1.5	0.1	6.9	2.3	8.2	86.8	24.6

Source: Authors' calculation from GTAP Database version 9

Appendix 8: List of organizations visited during field trips

1	Animal Husbandry Association of Viet Nam
2	Collective Cau Sat, Tu Tra, Don Duong, Lam Dong Province
3	Collective Tan Thong Hoi, Cu Chi, Ho Chi Minh City
4	Dairy Cow Husbandry Project of TH in Thanh Hoa
5	Dairy Viet Nam Co., Ltd.
6	Dalat Milk Joint Stock Company
7	Department of Industry and Trade, Lam Dong Province
8	Department of Livestock Production (MARD)
9	Division of Livestock Production, Department of Agriculture and Rural Development, Ho Chi Minh City
10	Division of Livestock Production, Department of Agriculture and Rural Development, Lam Dong Province
11	Export-Import and Industrial Trade Promotion Division, Ho Chi Minh Industry and Trade Department
12	Hoang Anh Gia Lai Livestock Joint Stock Company
13	TH Milk Food Joint Stock Company
14	Viet Nam Dairy Cow One-Member Company Ltd.
15	Viet Nam Dairy Products Joint Stock Company
16	Viet Nam Poultry Association
17	Vinamilk Dalat Dairy Farm, Viet Nam Dairy Cow One-Member Company Ltd.,
18	VISSAN limited Company

