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Vietnam 2035

The Vietnamese Economy through 2035: Alternative Baseline Growth, State-Owned Enterprise Reform, a Trans-Pacific Partnership and a Free Trade Area of Asia and the Pacific

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The Vietnamese Economy through 2035: Alternative Baseline Growth, State-Owned Enterprise Reform, a Trans-Pacific Partnership and a Free Trade Area of Asia and the Pacific

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Acronyms

AFTA	AEAN Free Trade Area
APEC	Asia Pacific Economic Cooperation
ASEAN	Association of South East Asian Nations
AVE	ad valorem equivalent
EIF	entry into force
EU	European Union
FTA	free trade agreement
FTAAP	Free Trade Area of Asia and the Pacific
GATS	General Agreement on Trade in Services
GDP	gross domestic product
Gdyn	Dynamic GTAP Model
GNI	gross national income
GTAP	Global Trade Analysis Project
HS	Harmonized System
IMF	International Monetary Fund
IP	intellectual property
ISIC	International Standard Industrial Classification
NTB	non-tariff barrier
NTMs	non-tariff measures
RCEP	Regional Comprehensive Economic Partnership
ROO	Rules of origin
SEG	State Economic Groups
SOE	State Owned Enterprise
SPS	sanitary and phytosanitary
TBT	technical barriers to trade
TFP	total factor productivity
TPP	Trans-Pacific Partnership
TRQs	tariff rate quotas
UN	United Nations
WTO	World Trade Organization

1 Overview of Vietnam 2035

Vietnam has benefited from a period of strong economic growth. Real GDP growth frequently exceeded seven percent prior to the start of the 2008-2009 financial crisis. Since 2010, Vietnam's real GDP has grown between five and six percent per year[4]. It has widely been reported that Vietnam's past success was fueled by rapid growth in the labor force and investment (Vietnam Development Report (VDR, 2012). Current forecasts are for lower investment and work force growth, and include a limited role for these sources as the main drivers of economic growth. It is expected that Vietnam's future growth will depend in part on government policies driving productivity growth. This report adds to the discussion by providing a range of estimates of Vietnam's economy out to 2035 to help identify key drivers of growth. These growth projections take into account global growth, along with projections of investment and the workforce in Vietnam. Decomposition of these projections allows us to analyze the role of key assumptions, including for investment and global growth, on the development of the Vietnamese economy.

The potential for several policy scenarios to impact Vietnam's GDP, investment and workforce are then tested. This allows us to identify and analyze the potential impact of these policies on the structure of output, trade and employment in Vietnam. Three scenarios are modeled from our standard, or mid-growth, baseline:

- a Trans-Pacific Partnership (TPP) agreement with 11 other Asia-Pacific countries, including the United States;
- a Free Trade Area of Asia and the Pacific (FTAAP) which would expand the TPP beyond the initial 12 members to include all APEC members, including China; and
- a limited reform of Vietnam's State Owned Enterprises (SOEs).

Projections of baseline growth illustrate that it is the low-middle income economies, including Vietnam, and China, which become the engines of global growth. However, China's growth rates are forecast to fall from recent historical highs, placing greater emphasis on the future role of the low-middle income economies, including Vietnam, on global growth. The share of high

[4] World Bank World Development Indicators.

income economies in global GDP falls by 16 percentage points over the period 2007 to 2035, while the upper-middle (excluding China) share remains fairly constant. Despite declining population growth, Vietnam's growth is forecast to remain robust due to continued investment, high education rates and technological change. Over time we find that technological change will need to increase in order to maintain these forecast growth rates. High growth in Vietnam is found to shift value-added and employment out of agriculture and towards services, with the share of services in value added rising from 45 to 57 percent of real GDP. Likewise, exports are expected to shift away from primary agricultural and extractive products towards heavy manufactures, particularly electrical machinery and metals, chemicals and transport, and services, construction and business services. Exports of textiles and wearing apparel are expected to continue their decline over the baseline. With China and low-middle income economies being the main drivers of growth globally, it is not surprising that they also become a more important source and destination for Vietnam's traded goods. Finally, in the high- and low-growth scenarios where global growth is accelerated and decelerated, the impact of global growth on Vietnam's economy is accentuated or dampened. If growth increases globally, Vietnam's agricultural output and exports decline further, while services rise. Increased global growth also accentuates the shift towards sourcing imports from China and the low-middle income economies, although increased global growth does not affect the destination of Vietnam's exports. We also find that increased global growth does not guarantee a rise in investment in all countries, in this case China.

Modeling the impact of the TPP and FTAAP provides important insights into key policy drivers of growth and economic development in Vietnam. The TPP is being promoted as a high standard trade agreement, which will improve market access for goods and services through the reduction of tariff and non-tariff measures (NTMs). As a leading supplier of light and medium manufactures in the Asia-Pacific region, Vietnam stands to obtain preferential access to some of the wealthiest markets in that region, such as the United States and Japan. In our simulations, the FTAAP would extend the regional market initially created by the TPP adding nine additional members. The FTAAP holds opportunities and threats for Vietnam: the threats include a possible erosion of preferences which would be enjoyed relative to other Asian economies in the US market for light manufactures. The opportunities would follow from deep reductions in NTMs in the Asia-Pacific region, beyond those Vietnam currently enjoys with its existing free trade agreements and TPP.

TPP projections suggest that this regional trade agreement could increase cumulative real GDP in Vietnam by over eight percent in 2030. The principal source of this increase in real GDP for Vietnam is projected to be tariff reductions in the TPP region—textiles and apparel in particular, where US tariffs remain high at over 17 percent ad valorem. Reductions in goods and services NTMs also promise to contribute significantly to Vietnam's growth. Investment in Vietnam is projected to increase by over 20 percent under the TPP, providing a substantial increase in capital stocks and long term growth. Wages are projected to increase in our five occupational

categories over the 2020-2035 period, with the highest growth in wages for low skilled workers. The FTAAP is projected to increase real GDP by 14 percent, when combined with the TPP. In contrast to the TPP, we project the most significant source of growth for Vietnam derived from an FTAAP will be greater liberalization of NTMs within the existing network of Asian FTAs. Tariff benefits from the FTAAP are somewhat elusive and product specific, with loses in tariff preferences in the existing TPP market roughly canceling benefits of gains in new FTAAP markets. Investment in Vietnam, when FTAAP is combined with TPP, is projected to add a cumulative 30 percent to baseline investment growth by 2025.

SOEs are an important domestic area for possible policy reform: they account for a large share of Vietnam's investment, yet they have been shown to be poor engines of growth, with their sales to asset ratios falling behind non-SOE firms. Reforming SOEs to perform at least as well as their non-SOE counter parts would provide a significant source of growth. SOE reform is projected to increase cumulative baseline real GDP by nearly nine percent in 2035. The SOE reform modeled assumes a gradualist approach to reform: SOEs which are considered strategic, such as government service providers, are excluded from our simulated impacts. Moreover, SOEs which are profitable and perform better than their non-SOE counterparts are assumed to stay in state hands. Of the remaining SOEs, we assume only 50 percent of them are reformed in the five year period starting in 2016. Under this SOE reform, wages for all occupation groups are projected to increase and investment in Vietnam is projected to increase by over 16 percent at its peak, relative to the baseline in 2022.

The following sections provide background and detailed estimates of each analysis. First, the baseline growth scenarios are presented, including mid-, high- and low-growth scenarios. Second, in the trade integration chapter, we provide the background and results of our modeling of the TPP and FTAAP. Finally, the simulation details of the SOE reform scenario are presented. The appendix contains numerous supporting tables, along with more detailed analysis of the modelling and assumptions.

2 The Model, Database, Baseline and Policy Scenarios

2.1 Overview of the GDyn Modeling Framework

The Dynamic GTAP model (GDyn) developed by Ianchovichina and McDougall (2012) is used for this analysis. The model is based on the standard GTAP model (Hertel and Tsigas, 1997) and includes many special features of the standard GTAP model, including sophisticated consumer demand specifications and inter-sectoral factor mobility. The dynamic model incorporates investment behavior that allows for the gradual equalization of global rates of return over time; and additional accounting relations to keep track of foreign ownership of capital. We further develop the model to link labor by occupation to educational attainment.

We use the GTAP v8.1L database.[5] Table 2-1 and Table 2-2 show the sectoral and regional aggregations used in this paper. For a list of sectors and regions used in the model and the mapping to the original 134 regions and 57 sectors of the GTAP Database (Narayanan, Aguiar et al. 2012) see Table AI- 1 and Table AI- 2 in Appendix I. Version 8.1L includes five labor categories, in contrast to the standard GTAP database which includes only two labor categories; this provides us with a more nuanced labor market, reflecting the matching of the work force to the newly evolving economy. Details of the factors of production can be found in Table AI-3.

The choice of sectors and regions in the aggregation reflects our focus on the Vietnamese economy: important sectors and trading partners of Vietnam have been selected, with the rest of the world divided into low-middle, upper-middle and high income, based on the World Bank classifications.

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5 Our decision to use the version 8.1l database, rather than an early pre-release of the GTAP 9 database was because the final version 9 had not been released at the time of this study and services trade had not yet been updated in the available pre-release version. This lack of contemporaneous services trade data for the latest benchmark year of 2011 not only affects the trade shares, but will also affect the domestic shares (in all countries) in unpredictable ways as the balancing procedure will cause domestic shares to adjust in order to be consistent with the outdates services trade data.

Table 2-1: Sectors and various aggregations used in this report

Column I Model aggregation	Column II Major sectors used for reporting results	Column III Major sectors used for reporting results	Column IV Detailed commodities and services used for reporting results
Rice	Agriculture	Agriculture (including proc. food)	Rice and other grain
Fishing	Agriculture	Agriculture (including proc. food)	Fish and livestock
Other grains	Agriculture	Agriculture (including proc. food)	Rice and other grain
Other agriculture	Agriculture	Agriculture (including proc. food)	Vegetables, fruit and nut
Livestock	Agriculture	Agriculture (including proc. food)	Fish and livestock
Forestry and wood products	Agriculture	Agriculture (including proc. food)	Forestry and wood
Extraction	Manufacturing (or oil, gas and other minerals)	Manufacturing (or oil, gas and other minerals)	Extraction
Meat products	Manufacturing	Agriculture (including proc. food)	Processed agriculture
Food and beverages	Manufacturing	Agriculture (including proc. food)	Processed agriculture
Textiles	Manufacturing	Manufacturing	Textiles, wearing apparel and leather
Wearing apparel and leather products	Manufacturing	Manufacturing	Textiles, wearing apparel and leather
Chemicals	Manufacturing	Manufacturing	Chemicals
Metals	Manufacturing	Manufacturing	Electronics, machinery and metallic products
Electronic equipment	Manufacturing	Manufacturing	Electronics, machinery and metallic products
Machinery	Manufacturing	Manufacturing	Electronics, machinery and metallic products
Transport equipment	Manufacturing	Manufacturing	Transport and other manufactures
Other manufactures	Manufacturing	Manufacturing	Transport and other manufactures
Other services	Services	Services	Other services
Construction	Services	Services	Construction and business services
Finance and insurance	Services	Services	Construction and business services
Transport	Services	Services	Trade, transport and communications
Trade and communications	Services	Services	Trade, transport and communications
Government services	Services	Services	Other services

Source: Authors' aggregation of the GTAP database. Note, the alternative definitions of processed food in manufacturing (column II) vs. agricultural goods (column III) is to provide comparison data for differing definitions of these sectors by international and local institutions.

Table 2-2: Regional and various aggregations used in this report

Column I Aggregated GTAP regions	Column II Major regions used in baseline analysis*	Column III Detailed regions used in policy analysis
Vietnam	Vietnam	Vietnam
Australia	High income economies	TPP (Other)
New Zealand	High income economies	TPP (Other)
China	China	China\Non-TPP
Hong Kong	High income economies	Non-TPP\FTAAP (other)
Japan	High income economies	TPP Asia
Korea	High income economies	Non-TPP\FTAAP (other))
Taiwan	High income economies	Non-TPP\FTAAP (other)
Indonesia	Low-middle income economies	Non-TPP\FTAAP (other)
Malaysia	Upper-middle incomes economies	TPP Asia
Philippines	Low-middle income economies	Non-TPP\FTAAP (other)
Singapore	High income economies	TPP Asia
Thailand	Upper-middle incomes economies	Non-TPP\FTAAP (other)
India	Low-middle income economies	Non-TPP
Canada	High income economies	TPP (Other)
USA	High income economies	USA
Mexico	Upper-middle incomes economies	TPP (Other)
Chile	High income economies	TPP (Other)
Peru	Upper-middle incomes economies	TPP (Other)
Russia	High income economies	Non-TPP\FTAAP (other)
Europe	High income economies	Non-TPP
Rest of ASEAN	Lower income economies	Non-TPP
Rest high income economies	High income economies	Non-TPP
Rest low-middle income economies	Low-middle income economies	Non-TPP
Rest upper-middle incomes economies	Upper-middle incomes economies	Non-TPP
Rest lower income economies	Lower income economies	Non-TPP

** Note that to the extent possible the allocation of countries to high-, upper-middle, low-middle and low income economies is based on http://data.worldbank.org/about/country-and-lending-groups. Some GTAP regions are aggregated into 'rest of' regions which contain countries from multiple categories. In these cases the allocation is based on the average category using population weights.*

Source: Authors' aggregation of the GTAP database

2.2 The Baseline

Like most dynamic models, a baseline scenario must be established for the Dynamic GTAP model. To build this baseline scenario forecasts must be obtained of key exogenous variables, including population, labor and technological change, as well as any appropriate policy. Table 2-3 lists the sources of our projections employed in this study.

Table 2-3: Sources of macroeconomic forecasts

	Source	Original data units	Countries	Time frame of data provided	Period tracked in baseline
		VIETNAM AND CHINA			
Vietnam's real GDP	Provided by World Bank	National currency	1	1989-2035 (est. after 2014)	2007-2035
Vietnam's real investment and gross national savings	Provided by World Bank	National currency	1	1989-2035 (est. after 2014)	2007-2035
Vietnam's real private consumption and government expenditure	Provided by World Bank	Share of GDP	1	2005-2014 (est. after 2012)	2007-2014
Vietnam's real exports and imports	Provided by World Bank	National currency	1	2005-2014 (est. after 2012)	2007-2014
China's real GDP growth	DRCSC (2014)	5-year average growth rates	1	2010-2030	2010-2030. Post 2030 continuation of 2030 TFP.
China's real investment	DRCSC (2014)	5-year shares of real GDP	1	2010-2030	2010-2030. Post 2030 continuation of risk premium changes.
China's real private consumption and government expenditure	DRCSC (2014)	5-year shares of real GDP	1	2010-2030	2010-2030. Post 2030 model determined (Cobb-Douglas)
		REST OF WORLD AND CHINA PRE-2010			
Real GDP	IMF (2014)	National currency	189	1980-2019 (est. after 2013)	2007-2019. Post 2019 continuation of 2019 TFP.
Investment	IMF (2014)	Share of GDP	189	1980-2019 (est. after 2013)	2007-2019. Post 2019 risk premium continued to adjust, but at declining rate over time.
Gross national savings	IMF (2014)	Share of GDP	189	1980-2019 (est. after 2013)	2007-2019. Post 2019 savings rate continued to adjust, but at declining rate over time.
Population	Fouré et al. 2012	Thousands of people	167	1980-2050	2007-2035
Labor force	Fouré et al. 2012	Thousands of people	167	1980-2050	2007-2035
Labor force by education	Fouré et al. 2012	Percentage of working-age population	167	1980-2050	2007-2035
World Export growth	IMF (2014)	Growth rates	189	1980-2019 (est. after 2013)	Averages of 2007-2014 and 2015-2019 used. Post 2019 export growth continued but at declining rate over time.

Source: Authors' compilation

3 Baseline Analysis

A key component of our analysis is the development of a baseline for the Vietnamese economy. In this section we outline some of the trends apparent in the three alternative baseline scenarios considered: standard (or mid-growth), low growth and high growth.

The baseline includes forecasts of real GDP, population, investment, government spending, private expenditure, savings, trade and the supply of labor by education level from various sources (Table 2-3). In the case of Vietnam and China, forecasts were supplied by the World Bank and the DRCSC (2014) respectively. For the other countries and aggregate regions forecasts were obtained from the IMF (2014) for 2007 to 2019. After 2019 assumptions were made based on the preceding years. Further details on how these forecasts were implemented and the assumption made are provided in Appendix II.

3.1 Standard (Mid-growth) Baseline

Table 3-1 depicts the average annual growth rates in real GDP for Vietnam, China and other aggregate regions. Growth is particularly high in the low-middle and low income economies as we see total factor productivity (TFP) of the developing countries and investment rise. The lower, but continued growth in the high income economies, including the high income economies of Asia, is due to continued investment in these economies.

Overall 24 percent of global growth in real GDP between 2007 and 2035 is due to China and 30 percent to the other non-high income economies. This causes the share of high income economies in real global GDP to decline from 77 to 60 percent over the period 2007 to 2035. China's share, on the other hand, rises from 6 to 16 percent over the same period. The share of lower-middle income economies also rises from 5 to 11 percent. Population growth rates reflect declining populations in high income economies and China, and to a lesser extent Vietnam and the upper-middle income economies.

Table 3-1: Average annual growth in real GDP and population (percent)

Regions*	2008-2014	2015-2020	2021-2025	2026-2030	2031-2035
			REAL GDP		
Vietnam	5.8	6.3	6.0	5.6	5.5
China	8.8	7.0	6.0	4.9	4.0
High income economies	0.9	2.3	2.2	2.2	2.3
Upper-middle incomes economies	2.6	3.4	3.4	3.2	2.9
Low-middle income economies	5.3	5.9	5.8	5.3	4.8
Lower income economies	5.5	6.1	5.4	4.6	3.9
			POPULATION		
Vietnam	0.96	0.80	0.56	0.40	0.29
China	0.62	0.46	0.22	0.06	-0.06
High income economies	0.55	0.38	0.27	0.20	0.13
Upper-middle incomes economies	1.05	0.89	0.73	0.60	0.48
Low-middle income economies	1.55	1.38	1.25	1.12	1.00
Lower income economies	2.22	2.15	2.02	1.91	1.80

**Aggregated regions listed in Table 2-2, column II.*

Source: Based on forecasts outlined in Table 2-3 and authors' model results and calculations.

Table 3-2 depicts average annual growth in trade over the entire baseline from 2015 to 2035. These growth rates come from the forecasts imposed on global trade after 2014 (IMF, 2014) and the trade liberalization that is assumed to occur in the baseline, along with other baseline assumptions. The past rise in global trade is expected to continue at least until 2019, according to IMF (2014) forecasts, and after 2014 we assume this rise in preferences for foreign goods continues, albeit at a declining rate.[6] We also reduce tariffs in the baseline to account for the plethora of trade agreements currently being undertaken by countries within the Asia-Pacific

6 The trade liberalization included in the baseline was not sufficient to explain growth in global trade. In order to achieve forecast growth a trend was applied to increase preferences for imports over domestic commodities; this was assumed to apply to all countries' imports equally. See Appendix II for further details.

region (see Table AIII- 1 for a list of the trade agreements incorporated into the baseline), including the gradual reduction in tariffs undertaken by Vietnam since 2007.

Table 3-2: Average annual growth in trade between 2007 and 2035 (percent)

	2014	2020	2025	2030	2035
REAL EXPORTS					
Vietnam	10.1	9.1	8.1	6.8	6.4
China	8.6	12.7	10.9	8.1	6.6
High income economies	2.2	6.9	5.9	4.4	3.5
Upper-middle income economies	2.7	7.7	6.9	5.1	3.9
Low-middle income economies	7.2	10.9	9.6	7.5	6.0
Low income economies	4.4	9.8	8.7	6.5	4.9
REAL IMPORTS					
Vietnam	8.7	8.9	7.7	6.4	5.7
China	9.7	11.2	9.1	6.5	4.6
High income economies	2.1	7.3	6.4	4.8	4.0
Upper-middle income economies	4.0	8.2	7.2	5.4	4.2
Low-middle income economies	5.4	9.9	8.9	6.9	5.6
Low income economies	6.6	9.5	7.9	6.0	4.8

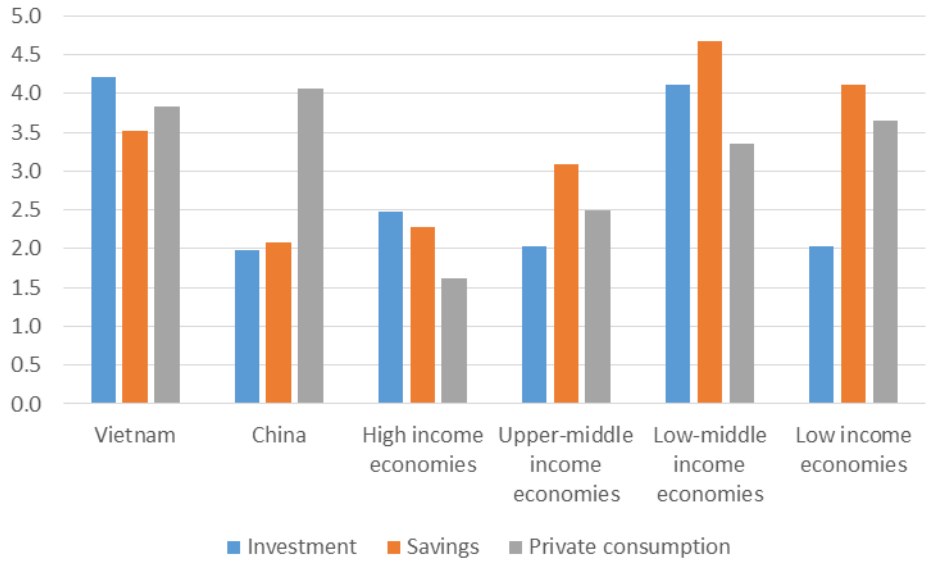
**Aggregated regions listed in Table 2-2, column II.*

Source: Based on forecasts (Table 2-3), trade liberalization (Table AIII- 1), and authors' model results and calculations.

Figure 3-1 depicts average annual growth in investment, savings and private consumption over the period 2015 to 2035. These growth rates come from the forecasts imposed, along with the other baseline assumptions. Investment is expected to grow substantially in Vietnam and the low-middle income economies, as well as in the high income economies; while in China investment will decline substantially relative to previous growth due to low rates of return on capital. China is also expected to experience a decline in its savings rate—the resulting combination is expected to significantly lower China's trade balance.

Growth in real investment of all countries, except Vietnam and China, reflect IMF forecasts until 2019. After 2019 it is assumed that any investment trends continue, albeit at a decreasing rate. Changes in savings rates are also driven by forecasts, while changes in private expenditure are dependent on changes in income and the changes in savings rates. In China the savings rates are forecast to decline, and hence growth in private expenditure is proportionately higher than that predicted by changes in income alone. With the exception of China, other economies savings are growing faster than private expenditure, except in Vietnam where growth rates in savings are slightly lower than private expenditure over the period.

Figure 3-1: Average annual growth in selected variables 2015-2035 (percent)*



** Aggregated regions listed in Table 2-2, column II.*

Source: Based on forecasts outlined in Table 2-3 and authors' model results and calculations.

Turning to Vietnam, Table 3-3, depicts the growth rates in real variables that were targeted (shaded in blue) for Vietnam and the resulting implied growth rates for other macro variables (not shaded).[7] Over the historical period, 2007 to 2014, most of the components of real GDP (shaded) were targeted to match real changes over the period, while savings and imports were determined as residuals (not shaded). After 2014, real investment and savings in Vietnam were targeted, with private expenditure and the trade balance determined as residuals.

An important difference between the Dynamic GTAP model (GDyn), and other models, is that GDyn takes into account foreign income flows from foreign ownership of capital. As investment rises relative to domestic savings, foreign ownership of capital must rise. This in turn means that rental income on that capital must be paid to foreigners for their ownership of capital. This tends to reduce gross national income (GNI) which in turn reduces savings and private consumption. In Vietnam, income paid to foreigners for their ownership of Vietnamese capital increases as more foreigners invest in Vietnam, while foreign income received falls as Vietnamese households decrease their investments abroad, causing consumption or savings to be lower than expected.[8]

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7 Note that the shares of expenditure in real GDP were not targeted since there were some differences in the initial shares resulting from the way in which the GTAP database balances and reconciles the global trade database. This reconciliation process alters the shares of exports, imports and hence the trade balance in GDP, thereby affecting all shares.

8 The inclusion of foreign capital flows explains why growth in private expenditure is less than forecast, since this increase in foreign capital flows was not accounted for. Note, that remittances received from Vietnamese labor located abroad are not included even though they are an important component of GNI in Vietnam (approximately 17% of GDP). These flows are also expected to grow with growing incomes earned abroad, but growth is not likely to offset the growth in foreign income paid on foreign ownership of capital.

Table 3-3: Vietnam's average annual growth rates for selected macro variables (percent change)

	2008-2014	2015-2020	2021-2025	2026-2030	2031-2035
Real GDP*	5.77	6.33	6.00	5.57	5.50
Real investment*	3.8	8.13	6.00	5.25	3.85
Real private consumption*	5.48	5.77	5.66	5.12	4.96
Real government consumption*	7.99	5.67	5.78	5.58	5.73
Real exports*	10.11	9.08	8.12	6.78	6.35
Real imports*	8.67	8.93	7.73	6.41	5.73
Real savings**	-12.76	5.28	4.94	5.21	4.41
Foreign income paid***	5.25	7.31	4.39	1.19	-2.39
Foreign income received***	-4.33	-3.78	-3.67	-2.89	-2.14

** Data based on actual real growth rates between 2007 and 2013, expected for 2014 and forecasts for 2015-2035 supplied by the World Bank.*

*** Data based on forecasts of growth in gross national savings for 2015-2035 supplied by the World Bank.*

**** Incomes from foreign ownership of capital.*

Source: World Bank and authors' model results and calculations.

The sources of Vietnamese growth in real GDP are mostly productivity and investment (or capital accumulation) (Table 3-4). While the growth in the supply of labor slows due to demographic changes in the population, efforts by the government to educate the Vietnamese population lead to a rise in tertiary and secondary educated workers, relative to uneducated workers, that increases the supply of more skilled workers. This also raises the productivity of workers, as the average education level of workers rises. More details on how educated workers are allocated across occupations are provided in Appendix I.

Available land for farming is assumed to decline gradually over the baseline as farm land is lost due to urbanization[9] and natural resources remain fixed. The relative decline in farm land and natural resources, and the lower productivity changes applied to these endowments, causes the return on land and natural resources to rise dramatically. The return to capital on the other hand declines over time with the accumulation of investment. Finally, with Vietnam's real GDP, investment and labor exogenously determined by the forecasts imposed on the baseline, productivity is endogenously determined as the residual required to achieve that forecasted growth in real GDP growth.

9 These estimates were based on information obtained from the World Bank on land used for rice production in Vietnam.

Table 3-4: Decomposition of growth in real GDP for Vietnam (average annual growth rate, percent)*

	Initial Share in Value-added	2008-2014	2015-2020	2021-2025	2026-2030	2031-2035
Real GDP	--	5.8	6.3	6.0	5.6	5.5
Land	8	-0.3	-0.4	-0.4	-0.4	-0.2
Capital	43	9.3	7.3	7.1	6.4	5.6
Natural resources	6	0	0	0	0	0
Managers and professionals	7	3.8	2.4	2.1	2.2	2.1
Technicians and associate professionals	7	3.7	2.4	2.1	2.2	2.1
Clerks	4	2.4	1.7	1.4	1.5	1.5
Service and shop workers	2	3.5	2.1	1.9	1.9	1.9
Low skilled	23	1.7	0.7	0.2	0.0	-0.2
Technological change (productivity)	--	0.6	3.1	3.4	3.6	4.5

** Endowments listed in Table AI- 3.*

Source: Authors' model results and calculations. Based on Fouré te al. (2012) forecasts of labor by education, changes in land due to urbanization obtained from the World Bank and IMF (2014) forecasts of investment.

An examination of the sectoral shares in value-added (Table 3-5 and Table 3-6) and in employment (Table 3-7) reveals a rise in the share of services over the period, and a fall in the importance of agriculture, across all country groups. The extent of this movement towards services is greatest in the developing economies: China, Vietnam, and the low- and low-middle income economies. By 2035, 30 percent of workers are employed in agriculture, down from 40 percent in 2007, with the reverse change occurring in services (Table 3-7). Detailed sectoral information is available for Vietnam in Table 3-6, showing large declines in the shares of all agricultural products, rice, other grains and livestock and rises in construction, business services including insurance and other services.

Table 3-5: Share of real value-added by aggregate sector (percent)*

Sectors**	2007	2014	2020	2025	2030	2035
			VIETNAM			
Agriculture	22.9	19.0	16.4	14.8	13.5	12.7
Manufactures	31.7	33.6	33.1	32.1	30.9	30.0
Services	45.4	47.5	50.5	53.1	55.5	57.3
			CHINA			
Agriculture	17.7	12.7	10.0	8.6	7.8	7.4
Manufactures	35.1	36.0	34.7	32.3	30.0	28.3
Services	47.3	51.3	55.3	59.1	62.2	64.3
			HIGH INCOME ECONOMIES			
Agriculture	2.6	2.6	2.5	2.5	2.4	2.3
Manufactures	20.4	20.6	20.0	19.5	19.2	19.1
Services	77.0	76.8	77.4	78.0	78.4	78.7
			UPPER-MIDDLE INCOMES ECONOMIES			
Agriculture	6.8	6.4	6.2	6.0	5.8	5.6
Manufactures	27.9	26.9	26.7	26.6	26.7	26.9
Services	65.3	66.6	67.1	67.4	67.5	67.5
			LOW-MIDDLE INCOME ECONOMIES			
Agriculture	17.5	15.0	12.5	10.8	9.4	8.2
Manufactures	24.7	24.8	24.7	24.2	23.7	23.0
Services	57.8	60.3	62.8	65.0	67.0	68.9
			LOWER INCOME ECONOMIES			
Agriculture	20.6	18.7	17.3	16.6	16.2	16.0
Manufactures	27.2	25.5	25.1	24.6	24.3	24.3
Services	52.2	55.8	57.6	58.8	59.5	59.8

** Based on 2007 prices*

*** Aggregated regions listed in Table 2-2, column II and aggregated sectors listed in Table 2-1, column II*

Source: Authors' model results and calculations.

Table 3-6: Share of real value-added by detailed sector (percent)*

Sectors**	2014	2020	2025	2030	2035
Rice and other grains	4.9	3.9	3.1	2.6	2.2
Vegetables, fruit, nuts, other basic agriculture	5.1	3.6	2.8	2.2	1.7
Fish and livestock	4.7	3.8	3.3	2.8	2.5
Processed food	3.1	3.1	3.3	3.5	3.8
Forestry and wood products	4.3	5.0	5.6	6.0	6.3
Oil, gas, minerals	14.0	14.5	14.8	15.3	16.4
Textiles, apparel, and leather	7.5	7.5	6.9	6.0	4.9
Chemicals	2.7	2.5	2.4	2.1	1.8
Transport and other manufactures	2.8	2.4	2.1	1.8	1.4
Electrical machinery and metals	3.5	3.2	2.8	2.2	1.7
Construction, insurance, business services	12.0	13.6	14.7	15.7	16.0
Trade, transport and communications	10.0	10.4	10.7	11.0	11.1
Other services (govt and private)	25.4	26.5	27.7	28.9	30.3

** Based on 2007 prices*

*** Aggregated regions listed in Table 2-2, column IV.*

Source: Authors' model results and calculations.

Table 3-7: Shares of total employment (percent)

	Vietnam*	China	High income economies	Upper-middle incomes economies	Low-middle income economies	Lower income economies
			AGRICULTURE			
2007	40	52	10	26	53	54
2035	30	46	12	22	38	39
			MANUFACTURING			
2007	28	18	15	14	13	13
2035	30	18	13	12	13	12
			SERVICES			
2007	33	30	75	60	34	33
2035	40	37	75	67	49	49

** Aggregated sectors are listed in Table 2-1, column IV and regions listed in Table 2-2, column II.*

Source: Authors' model results and calculations.

In many countries, including Vietnam and China, the share of agriculture in value added is a higher in the underlying GTAP data than the data supplied by the World Bank would indicate, for that year. This could be due to differences in how agriculture is defined between the GTAP database and in the World Bank data, for instance GTAP agriculture includes agricultural services, while the exact definition of the agricultural data from the World Bank is unknown. As with the macro data we opted to compare the real annual growth rates in sectoral value-added rather than impose the shares provided by the World Bank. We found that when the changes between 2007 and 2014 obtained from the model were compared with those provided

by the World Bank for agriculture, industry (including construction) and services, the growth rates were comparable (see Table 3-8).

Table 3-8: Annual average growth rate by aggregate sector 2008-2014 (percent)*

Sectors**	GDyn model baseline	World Bank
Agriculture	2.6	3.2
Industry (including construction)	5.8	6.0
Services	6.6	6.7

** Note that the World Bank growth rates are adjusted to match growth in real GDP at market prices. The model growth rates by sector are growth in total value added.*

*** Similar to aggregated sectors listed in Table 2-1, column II, except construction is included in industry.*

Source: Authors' calculations and World Bank

Table 3-3 shows a marked increase in Vietnam's trade over the period 2007-2035 in the baseline. Although a small component of trade, services trade growth in finance, insurance and other business services is particularly high (Table 3-9). We also project increases in electrical equipment and machinery and declines in exports of wearing apparel, agriculture, and oil, gas and minerals.

Table 3-9: Share of Vietnam's real exports by commodity (percent)

Sectors*	2007	2014	2025	2035
Rice and other grains	2.9	2.2	1.4	1.0
Vegetables, fruit, nuts, other basic agriculture	6.0	3.5	2.2	1.5
Fish and livestock	0.4	0.2	0.3	0.4
Processed food	8.8	5.0	5.8	6.7
Forestry and wood products	6.4	6.0	6.9	7.4
Oil, gas, minerals	19.2	15.8	11.6	9.2
Textiles, apparel, and leather	25.8	34.2	29.8	23.9
Chemicals	4.5	4.9	6.5	7.1
Transport and other manufactures	3.6	3.8	4.8	4.7
Electrical machinery and metals	13.6	16.3	18.5	19.0
Construction, insurance, business services	3.9	3.5	5.8	8.7
Trade, transport and communications	3.4	2.7	3.1	3.7
Other services (govt and private)	1.7	1.7	3.2	6.6

** Aggregated sectors are listed in Table 2-1, column IV.*

Source: Authors' model results and calculations.

In terms of export destinations, **Error! Reference source not found.** shows a considerable shift away from high income economies towards China and low or low-middle income economies as a destination for Vietnamese products. The share of services in Vietnam's exports to all regions rises, including to the high income economies. The share of agriculture in Vietnam's exports, on the other hand, declines for all destination regions, except China.

Table 3-10 Share of Vietnam's trade by major commodity, source and destination, selected years (percent)*

	Vietnam exports by destination			Vietnam's imports by source		
	2014	2025	2035	2014	2025	2035
CHINA						
Agriculture	1.7	2.6	2.8	0.5	0.8	1.1
Manufactures	7.9	11.4	12.2	24.6	33.9	36.3
Services	0.4	0.6	0.9	0.6	1.7	3.0
Total	10.0	14.7	15.9	25.7	36.3	40.4
HIGH INCOME ECONOMIES						
Agriculture	7.3	6.1	6.0	2.0	2.1	1.9
Manufactures	59.2	51.2	43.8	46.1	34.5	29.6
Services	6.2	9.4	14.4	7.8	8.2	7.7
Total	72.7	66.7	64.2	55.9	44.9	39.2
UPPER-MIDDLE INCOMES ECONOMIES						
Agriculture	0.7	0.5	0.4	1.0	1.0	0.9
Manufactures	7.6	7.6	6.8	9.3	7.7	7.1
Services	0.7	1.2	2.0	0.6	0.8	0.8
Total	9.1	9.3	9.2	10.9	9.5	8.8
LOW-MIDDLE INCOME ECONOMIES						
Agriculture	2.1	1.5	1.2	0.6	0.7	0.7
Manufactures	3.6	4.6	5.4	4.6	4.9	5.2
Services	0.5	0.8	1.4	0.8	1.7	3.0
Total	6.1	6.9	7.9	6.1	7.3	8.9
LOWER INCOME ECONOMIES						
Agriculture	0.1	0.1	0.1	0.5	0.8	1.1
Manufactures	1.9	2.3	2.5	0.8	1.0	1.3
Services	0.1	0.2	0.2	0.1	0.2	0.3
Total	2.2	2.5	2.8	1.4	2.1	2.7

** Aggregated sectors are listed in Table 2-1, column II, aggregated regions listed in Table 2-2, column II.*

Source: Authors' model results and calculations.

The shift away from high income economies towards China and the low and low-middle income economies is even more pronounced on the import side (Table 3-10), with the share of Vietnam's imports sourced from China rising from 26 percent in 2014 to 40 percent in 2035 in the baseline.

In the next section we examine how this scenario differs from the two alternative baseline scenarios, the low- and high-growth scenarios.

3.2 High-growth and Low-growth Scenarios

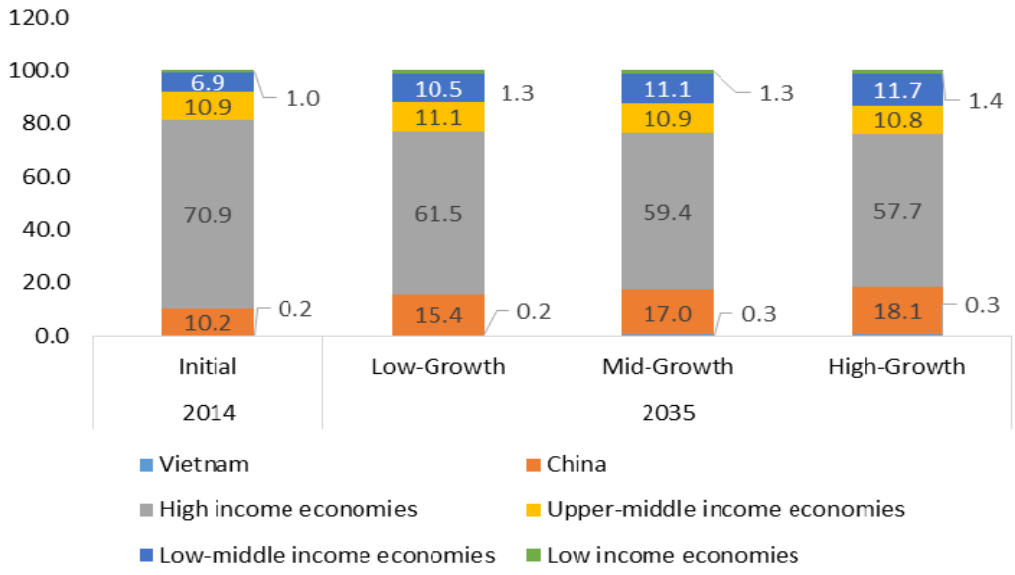
As far as possible the standard or mid-growth scenario outlined above matches the latest publicly available forecasts, with additional information collected on Vietnam and China. The two alternative baselines scenarios considered are:

1. Low-growth: under this scenario, growth is expected to decline relative to the standard baseline. China's growth is expected to slow to 3.5 percent by 2030 (see p.28 of the DRCSC (2014)). Using the model we find that in order to accomplish this growth path in China, productivity must fall by 40 percent. This decline in productivity of 40 percent is than applied to all countries and regions in the baseline.

2. High-growth: under this scenario we raise the productivity of all countries by 40 percent.

The resulting average annual growth rates over each period are provided in Table 3-11. As expected, after 2014, the growth rates are consistently higher in the high-growth scenario and lower in the low-growth scenario.

Figure 3-2: Share of global real GDP by region in 2015 and 2035 under alternative baseline scenarios (percent)*



** Aggregated regions are listed in Table 2-2, column II.*

Source: Authors' model results and calculations.

Figure 3-2 depicts the change in real GDP shares of the aggregated regions between 2015 and 2035. In all three scenarios the high income economies have decreased as a share of world GDP from 70 percent to around 60 percent, depending on which scenario is examined. The upper-middle income economies have maintained their share, while the China, Vietnam and the low- and low-middle income economies have increased their shares. The difference between the three scenarios is consistent with expectations, with higher growth raising the shares of the

lower income groups in world GDP even further as their growth rates rise relative to the high income economies.

Table 3-11: Growth in real GDP under alternative baseline scenarios (percent)*

	2008-2014	2015-2020	2021-2025	2026-2030	2031-2035
			VIETNAM		
Low-growth	5.8	5.2	4.8	4.4	4.3
Mid-growth	5.8	6.3	6.0	5.6	5.5
High-growth	5.8	7.4	7.2	6.6	6.6
			CHINA		
Low-growth	8.8	6.4	4.9	3.5	3.0
Mid-growth	8.8	7.0	6.0	4.9	4.0
High-growth	8.8	8.0	7.0	5.6	4.6
			HIGH INCOME ECONOMIES		
Low-growth	0.9	1.9	1.9	1.9	1.8
Mid-growth	0.9	2.3	2.2	2.2	2.3
High-growth	0.9	2.7	2.5	2.6	2.7
			UPPER-MIDDLE INCOMES ECONOMIES		
Low-growth	2.6	3.0	3.0	2.6	2.3
Mid-growth	2.6	3.4	3.4	3.2	2.9
High-growth	2.6	3.7	3.9	3.7	3.4
			LOW-MIDDLE INCOME ECONOMIES		
Low-growth	5.3	5.1	4.9	4.5	4.1
Mid-growth	5.3	5.9	5.8	5.3	4.8
High-growth	5.3	6.8	6.7	6.1	5.5
			LOWER INCOME ECONOMIES		
Low-growth	5.5	5.3	4.5	3.7	3.1
Mid-growth	5.5	6.1	5.4	4.6	3.9
High-growth	5.5	6.9	6.2	5.3	4.6

** Aggregated regions are listed in Table 2-2, column II*

Source: Authors' model results and calculations.

Differences in investment, trade and savings under the high and low scenario are, for the most part, also consistent with expectations. Higher global growth raises production, income and trade, which in turn raises savings globally, hence investment and capital accumulation (Table 3-12). Table 3-13 illustrates the impact of the three alternative baselines on Vietnam, in particular.

Despite the rise in global savings, investment in every country or region does not rise in response to higher growth, particularly in the long run. It is important to recognize that investment responds to relative rates of return, which are in turn impacted by capital accumulation. Greater investment and early capital accumulation in a given country or region reduces the availability of future investment opportunities, potentially driving future rates of

return down more quickly, causing investment growth to drop off more quickly over time. This drop off in investment growth in the long run is most evident in China, and to a lesser extent Vietnam and Indonesia.

Changes in Vietnam's trade balance as a share of GDP under the three scenarios, shown in Figure 3-3, illustrate the decline in the trade deficit as a proportion of GDP over time, particularly the sharp decline in the high growth scenario.

Table 3-12: Average annual growth rates for selected macro variables between 2015 and 2035 (percent change)

	Real Exports	Real Imports	Real Investment	Real Savings
VIETNAM				
Low-growth	6.4	6.2	5.1	3.9
Mid-growth	7.7	7.3	5.9	5.0
High-growth	8.8	8.3	6.4	6.0
CHINA				
Low-growth	8.3	7.3	3.0	1.9
Mid-growth	9.7	8.0	2.7	2.9
High-growth	10.8	8.6	2.4	3.8
HIGH INCOME ECONOMIES				
Low-growth	4.9	5.2	3.0	2.7
Mid-growth	5.3	5.7	3.5	3.2
High-growth	5.7	6.3	4.0	3.7
UPPER-MIDDLE INCOME ECONOMIES				
Low-growth	5.6	5.7	2.0	3.7
Mid-growth	6.0	6.3	2.8	4.3
High-growth	6.4	6.9	3.5	4.9
LOW-MIDDLE INCOME ECONOMIES				
Low-growth	7.7	7.1	5.2	5.7
Mid-growth	8.7	8.0	5.9	6.6
High-growth	9.7	8.8	6.5	7.5
LOW INCOME ECONOMIES				
Low-growth	6.8	6.2	1.7	4.9
Mid-growth	7.6	7.2	2.8	5.8
High-growth	8.4	8.0	3.7	6.8

** Aggregated regions are listed in Table 2-2, column II*

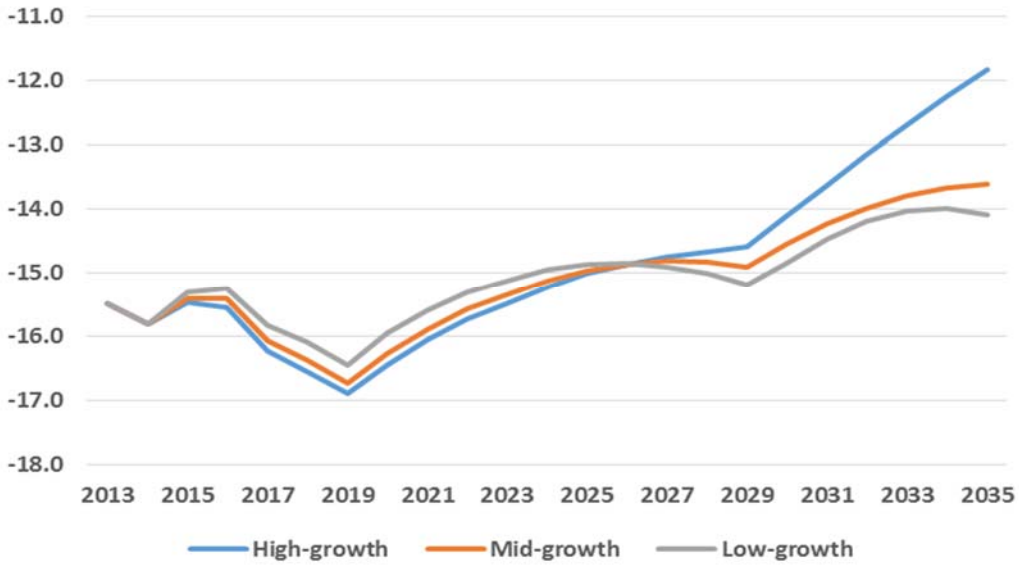
Source: Authors' model results and calculations.

Table 3-13: Vietnam's average annual growth rates for selected macro variables (percent change)

	Low-Growth		Mid-Growth		High-Growth	
	2015-2025	2026-2035	2015-2025	2026-2035	2015-2025	2026-2035
Real GDP	5.0	4.3	6.2	5.5	7.3	6.6
Real investment	6.3	3.9	7.2	4.6	8.1	4.6
Real private consumption	4.6	4.0	5.7	5.0	6.8	6.0
Real government consumption	4.9	4.5	5.7	5.7	6.6	6.8
Real exports	7.5	5.3	8.7	6.6	9.8	7.8
Real imports	7.3	4.9	8.4	6.1	9.5	7.1
Real savings	4.1	3.7	5.1	4.8	6.2	5.8
Foreign income paid	4.5	-1.7	6.0	-0.6	7.3	-0.5
Foreign income received	-4.0	-2.8	-3.7	-2.5	-3.5	-2.1

Source: Authors' model results and calculations.

Figure 3-3: Vietnam's trade balance as a share of GDP over time (percent)



Source: Authors' model results and calculations.

The impact of the alternative growth scenarios on value-added in production is shown in Table 3-14. As growth in Vietnam and the rest of the world increases, agriculture declines even further as a share of value added, while services rise; and manufacturing remains fairly constant. The different scenarios also differ slightly in their allocation of educated workers across occupations, with higher global growth causing higher demand for the more skilled occupations. As a result, fewer workers with secondary education end up working in the low skilled occupations in the high-growth scenario.

Table 3-14: Vietnam's Share of real value-added and number of workers by aggregate sector (percent)

Sectors*	2014	Low-growth		Mid-growth		High-growth	
		2025	2035	2025	2035	2025	2035
VALUE ADDED							
Agriculture	19.0	15.2	13.8	14.8	12.7	14.2	12.0
Manufactures	40.5	40.9	38.7	40.9	39.0	41.0	39.1
Services	40.6	43.9	47.5	44.4	48.3	44.8	49.0
NUMBER OF WORKERS							
Agriculture	39.6	37.3	35.0	34.6	29.6	32.0	25.3
Manufactures	36.9	37.3	36.0	38.3	37.6	39.2	38.1
Services	23.5	25.5	29.0	27.1	32.8	28.7	36.7

** Aggregated sectors are listed in Table 2-1, column II*

Source: Authors' model results and calculations.

Table 3-15 and Table 3-16 provide the bilateral trade shares for Vietnam's exports and imports respectively under the three alternative scenarios. These tables show that under the alternative scenarios, the shift away from exporting agriculture towards services intensifies when the global growth is higher. The destination of those Vietnamese exports in shares, however, does not appear to be affected by the higher global growth. The situation is somewhat different for imports. Here the share of imports by commodity remains unchanged, while the source of imports shifts further away from the high income economies towards the lower income economies as global growth increases.

Table 3-15: Share of Vietnam's exports by major commodity and destination, selected Years (percent)

Sectors*	China	High income economies	Upper-middle income economies	Low-middle income economies	Low income economies	Total
			2014			
Agriculture	1.7	7.3	0.7	2.1	0.1	11.9
Manufactures	7.9	59.2	7.6	3.6	1.9	80.2
Services	0.4	6.2	0.7	0.5	0.1	7.9
Total	10	72.7	9	6.2	2.1	100
			2035 Low-Growth			
Agriculture	2.9	6.6	0.4	1.5	0.1	11.5
Manufactures	12	45.5	7	5.4	2.4	72.3
Services	0.8	12.3	1.7	1.2	0.2	16.2
Total	15.7	64.4	9.1	8.1	2.7	100
			2035 Mid-Growth			
Agriculture	2.8	6	0.4	1.2	0.1	10.5
Manufactures	12.2	43.8	6.8	5.4	2.5	70.7
Services	0.9	14.4	2	1.4	0.2	18.9
Total	15.9	64.2	9.2	8	2.8	100
			2035 High-Growth			
Agriculture	2.6	5.5	0.3	1	0.1	9.5
Manufactures	11.7	41.6	6.5	5.3	2.6	67.7
Services	1	17.3	2.4	1.7	0.3	22.7
Total	15.3	64.4	9.2	8	3	100

** Aggregated sectors are listed in Table 2-1, column II and aggregated regions are listed in Table 2-2, column II.*

Source: Authors' model results and calculations.

Table 3-16: Share of Vietnam's imports by major commodity and destination, selected years (percent)*

	China	High income economies	Upper-middle income economies	Low-middle income economies	Low income economies	Total
			2014			
Agriculture	0.5	2	1	0.6	0.5	4.6
Manufactures	25.4	44.6	9	4.6	0.8	84.4
Services	0.7	8.7	0.7	0.9	0.1	11.1
Total	26.6	55.3	10.7	6.1	1.4	100
			2035 LOW-GROWTH			
Agriculture	0.8	1.9	0.9	0.7	1.1	5.4
Manufactures	35.1	29.6	7	5.3	1.1	78.1
Services	2.7	9.8	0.9	2.8	0.3	16.5
Total	38.6	41.3	8.8	8.8	2.5	100
			2035 MID-GROWTH			
Agriculture	1.0	1.8	0.9	0.7	1.1	5.5
Manufactures	36.9	27.6	6.7	5.1	1.3	77.6
Services	3.4	9.1	0.9	3.3	0.3	17.0
Total	41.3	38.5	8.5	9.1	2.7	100.1
			2035 HIGH-GROWTH			
Agriculture	1.2	1.7	0.8	0.7	1.1	5.5
Manufactures	37	26.9	6.6	5	1.5	77
Services	3.8	8.5	0.9	3.9	0.3	17.4
Total	42	37.1	8.3	9.6	2.9	100

** Aggregated sectors are listed in Table 2-1, column II and aggregated regions are listed in Table 2-2, column II.*

Source: Authors' model results and calculations.

4 Scenarios on Trade Integration

The Asia-Pacific region continues to be a dynamic region of growth. Vietnam is harnessing the growth opportunities by further integrating its economy, including by advancing free trade agreements with the Association of South East Asian Nations (ASEAN) countries and other major partners in Asia such as Japan, Korea and China. Many agreements have already been concluded and are being phased in over time. Table AIII- 1 list selected trade agreements in the Asia Pacific region which are currently being phased in.

Trade integration is likely to continue to play an important role in Vietnam's growth. In particular, Vietnam is currently negotiating several significant agreements including the Trans-Pacific Partnership (TPP), the Regional Comprehensive Economic Partnership (RCEP), and a free trade area with the European Union (EU). In this section, we explore some impacts on Vietnam of two significant potential trade agreements:

- Trans-Pacific Partnership; and
- Free Trade Area of the Asia Pacific (FTAAP).

The TPP agreement is currently under negotiation by Vietnam and 11 other member countries in the Asia-Pacific region. The second agreement, the FTAAP, is a proposal developed primarily as a result of discussions amongst members of the Asia Pacific Economic Cooperation (APEC) forum. The goal of the FTAAP would be to join the APEC members in one, region wide, free trade agreement.[10] While APEC does not hold a mandate for conducting trade negotiations and no country or group of countries has initiated negotiations through a formal memorandum of understanding, the FTAAP provides an intriguing possibility for wider trade integration in the Asia-Pacific region, beyond the TPP.[11]

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10 The APEC members include: Australia, Brunei Darussalam, Canada, Chile, China, Hong Kong China, Indonesia, Japan, South Korea, Malaysia, Mexico, New Zealand, Papua New Guinea, Peru, the Philippines, Russia, Singapore, Taiwan, Thailand, USA and Vietnam. The notable exception from APEC is India, which would be included in the RCEP.

11 It is notable that China announced its backing of an FTAAP at the APEC forum held in Beijing in November 2014, giving credibility to this track of negotiations.

In both of these agreements, little is known about the ultimate outcome of negotiations. The TPP member countries have announced a goal for a "comprehensive and high-standard" next generation FTA which recognizes that tariff barriers, while important, will only be a part of the negotiations. In addition to lowering tariffs on goods trade, members have also signaled their aim to lower barriers to services trade, non-tariff barriers on goods trade, intellectual property, reduce the role of state owned enterprises in markets, and e-commerce among other areas. The TPP is also being tasked with addressing the overlapping rules and regulations of existing trade agreements, thereby bringing regulatory coherence to regional trade.[12]

Much less is known about any potential form of an FTAAP agreement. Our approach to developing assumptions about the form or "tracks" of these two agreements is guided by previous research. In the following sections we briefly review each of the two trade agreements we are considering. These trade agreements are expected to be "comprehensive in coverage", however, we are not able to fully model all aspects of these agreements, therefore, we note where our analysis is best-suited to providing insights. We then analyze the projected impacts of these trade agreements on Vietnam through to 2035, including considering changes in GDP, trade flows, industry structure, and labor markets.

4.1 Trans-Pacific Partnership (TPP)

The TPP negotiations have their roots in an initial set of negotiations which started in 2002 between Chile, New Zealand and Peru. By 2005, the agreement was signed, with the addition of a fourth country, Brunei (members of this agreement are called the P4). In early 2008, the US started talks with the P4 members to create the TPP and by late 2008, Australia, Vietnam and Peru had announced they would join the P4 trade block, providing the vehicle for these countries to join the TPP. The last country to formally join the TPP negotiations was Japan in July 2013, bringing the number of TPP negotiating countries to 12: Brunei, Chile, New Zealand, Singapore, USA, Australia, Peru, Vietnam, Malaysia, Mexico, Canada and Japan.

12 At the 2011 APEC meeting, TPP partners announced their intention to negotiate "a comprehensive, next generation regional trade agreement that liberalizes trade and investment and address new and traditional trade issues and 21st century challenges". United States Trade Representative (http://www.ustr.gov/about-us/press-office/factsheets/2011/november/outlines-tran-pacific-partnership-agreement.)

4.1.1 HIGH STANDARD FTA

As noted earlier, the TPP is being billed as a "comprehensive and high standard" agreement. While there are not formal definitions of "comprehensive" or "high standard," statements from TPP trade negotiators over the past several years have indicated any agreement is likely to be inclusive of the following areas:

- most or all products included in the 21 sections of the harmonized classification system (HS);
- non-tariff measures in goods trade (e.g., technical barriers to trade, sanitary and phytosanitary regulations, local distribution and license systems);
- non-tariff measures on services trade, such as domestic ownership and licenses;
- intellectual property (IP);
- labor standards;
- state owned enterprises;
- environmental regulation;
- e-commerce; and
- investment barriers.

In our analysis, we consider the impacts of the first three elements of the TPP: reductions in tariffs on goods, along with non-tariff measures on goods and services. This is not to suggest the other elements are not important or significant; it is an acknowledgement of data restrictions, along with limitations of our current modeling approach. [13]

Our modeling approach applies the widely recognized global GDyn model, which includes well recognized and clearly understood techniques for modeling trade agreements. Data on international tariff and quotas have been developed over the past 50 years as a result of numerous rounds of trade negotiations and are widely accepted. However, in the case of non-tariff measures in goods and services trade, we recognize that many of the estimates of these barriers are "first generation" estimates and uncertainty exists in defining their magnitude and detailed linkages to the economies they represent (UN 2009).[14] It is important to note, while

13 Our model does include a dynamic and rate of return driven representation of investment, but it does not explicitly include measures of reducing investment barriers as a result of the TPP. In the areas of IP, labor standards, investment and environmental regulations, estimates of the restrictiveness of these rules are not frequently estimated or published and there remains little consensus in the international community on the best approach and methods for projecting impacts.

14 The United Nations are currently pursuing surveys to improve the measurement of these barriers.

discussing the limitations of our modeling approach, we model liberalization in trade in services as being limited to the World Trade Organizations (WTO) General Agreement on Trade in Services (GATS) mode 1, cross border trade in services.[15] This does not mean the other modes will not be included in the TPP negotiations – for instance mode 3, commercial presence—rather, it is a recognition of the limited developments in modeling techniques and data to capture this important aspect of services trade (Christen, Francois, and Hoekman, 2013).

4.1.2 SCENARIO AND MODELING APPROACH

In section 3 of this report, the details of the baseline analysis were presented along with estimates of how we project the Vietnamese and world economy to evolve between 2015 and 2035. In our analysis of the TPP, the policy simulation is undertaken relative to this baseline environment that is anticipated in the absence of a TPP agreement.

Our analysis of the TPP is based around three core areas included in the TPP:

— tariff liberalization;

— non-tariff barriers in goods trade; and

— non-tariff barriers in services trade.

We briefly review our modelling of these core TPP liberalization areas below.

Market Access in Goods (tariffs)

Reductions in tariffs continue to be a significant component of market access under trade agreements such as the TPP, particularly for Vietnam. While many countries have lowered average tariffs to below 10 or even five percent, tariff peaks still remain. For example, in the US market, tariffs on wearing apparel imports range between 10 and 32 percent, depending on the class of good (generally man-made fiber knit products draw the highest tariffs). Agricultural goods are still governed by tariff rate quota systems, which can lead to tariff rates which may be prohibitive in products such as dairy, meat, and rice. Finally, Vietnam is at an earlier stage of development than many TPP countries; tariffs are still employed to protect infant industries, leading to tariffs which can exceed an average of 10 or 20 percent on a wide range of products.[16]

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15 Our simulation of a reduction in goods and services NTMs is modeled as a shift in preferences toward imported goods in quantity equivalent to a tariff change resulting in the same quantity of imports (see Fugazza and Maur, 2008). This method maintains the advantage that it does not change the government tariff revenues while achieving similar changes in trade implied by the "tariff equivalent" of the NTMs. In doing so, we make no assumptions about the allocation of rents between the two parties in the model. While liberalization of services and goods NTMs may result in changes in productivity, we do not incorporate these types of effects.

16 Vietnam has made a number of unilateral reductions in its import tariff rates since its accession to the WTO in 2007. Tariff rates, while substantially lower than in 2007 (often half of what they were), are still higher than the average rates in developed countries.

The authors of other papers investigating TPP, summarized in Table AIII- 2, employ a variety of methods for modeling tariff reductions. They range from simple, such as reducing all tariffs to zero for member countries and ignoring existing trade agreements (Areetat and Kameyama 2012), through to much more nuanced scenarios where existing trade concessions are recognized, sensitive products are excluded, and longer phase-in schedules are recognized (Petri et al. 2011 and 2012). In this paper we follow a similarly nuanced strategy, incorporating the modeling of existing agreements along with careful phasing in of liberalization and sensitive products in the agreements under consideration.

Analysis that aims to explore the impact of prospective agreements in the Asia-Pacific region should take into account agreements already completed, even if they will be phased in over time: ignoring existing, ratified trade agreements in the baseline risks attributing trade liberalization already agreed upon to future trade agreements such as those we consider here. Our analysis therefore includes existing trade agreements in the baseline, even if not yet fully implemented. Table AIII- 1 lists trade agreements integrated into our baseline and the assumptions employed. An important aspect of integrating existing trade agreements into the baseline is our assumptions on tariff phase-out and on the percent of sensitive products which are permitted to be excluded from the agreement. The inclusion of sensitive products is important to understand the projected tariff schedules we apply TPP against (Table 4-2). Many of the trade agreements integrated into our baseline contain lists of exempt products. While these exemptions appear to be relatively modest when reported in percent of HS6 lines exempt (one to five percent of HS6 lines), they tend to include products which comprise larger shares of trade when measured in value terms. While many trade agreements in the Asia–Pacific region, like the rest of the world, have seen a move toward freer trade, they are not "free" trade.[17] Importantly for Vietnam, tariff exemptions are frequently granted or designated on textiles and apparel. While the ASEAN Free Trade Agreement (AFTA) has lowered tariffs in that region, textiles and apparel continue to be selected for special treatment when sensitive products are permitted. This distinction may leave room for further advances on eliminating tariffs on existing products.[18]

Table 4-1 provides an overview of our tariff cutting formula. The individual elements are discussed below.

Table 4-1: Tariff scenarios and phase-ins TPP

Scenario	Sensitive Products	Entry into Force (EIF)	Years to implement
TPP-12	A-1.0%	A-75%	A-10
	B-1.0%	B-65%	B-15

A = Developed countries; and B = Developing with flexibilities (defined in A-II-3)

Source: Derived from Petri (2011).

17 In particular, the USA maintains restriction on sugar and dairy products.

18 For example, Japan and Korea have been notable for the high number of sensitive agriculture and automobile barriers they maintain after signing free trade agreements.

Sensitive Products

Sensitive products, as mentioned earlier, are those either exempt from tariff reduction or those provided partial, though not free, access. We recognize that trade agreements as complex as the TPP are rarely completed without some concessions on sensitive products (Petri et al. 20011 and 2012). Neglecting the inclusion of sensitive products can have significant impacts on results, since a small number of sensitive products can make up a large proportion of trade. However, members claim that the TPP is a comprehensive and high standard agreement, therefore, we set the number of sensitive products on the low side of trade agreements in the Asia-Pacific (see Table AIII- 1), at one percent of tariff lines.[19] Following Jean et al. (2008) we define exempt products by a trade value formula for each member, such that products which are projected to result in the greatest change in trade value are ranked most likely to be exempt from tariff reductions and therefore sensitive. We further adapt this formula to account for the politically sensitive nature of agricultural products under tariff rate quotas (TRQs) in the economies of Canada, Japan, and the United States, by recognizing these tariff lines are likely to be first to be excluded from tariff reductions.[20] In the case of other countries, manufactures and agriculture imports are ranked without distinction when defining sensitive products.

Entry into Force and Years to Implement Agreements

Trade agreements are most often phased in over a number of years to facilitate the adjustment of domestic interests to new market forces. We employ two measures of a trade agreement's rate of tariff reduction that can help to indicate if a trade agreement's benefits are expected in the near term or the distant future. First, we estimate the number of tariff lines which will be made free on entry into force of the agreement (though we recognize these early liberalization scenarios can be carried out over the first few years). Next, we project the number of years over which the remaining tariffs are phased out.

In regards to the rate of phase-out, we make a distinction between two groups of countries, developed and developing, with the developing countries provided some flexibilities in phasing out their tariffs. Table AIII- 3 lists the two groups of countries, with Vietnam classified in the group provided more flexibilities in tariff phase-out.

Tariff Projections

Table 4-2 summarizes the baseline average tariff levels we project for Vietnam when exporting in 2030, without TPP or FTAAP agreements. By 2030, most trade agreements in the baseline will be concluded, however, our inclusion of a small number of sensitive products results in average tariff levels which are somewhat greater than zero. For example, in the case of China, high tariffs remain on rice and certain chemical products. In the TPP-Asia region, significant tariffs are projected to remain on rice and textile products, due to exemptions in existing trade

19 One percent of HS6 tariff lines is approximately 50 HS6 products.
20 In practice, TRQs are often expanded to allow greater in-quota shipments, but are not always eliminated.

agreements. Notable for our analysis, the USA and other TPP countries have relatively low tariffs overall, except in textiles and apparel, where tariffs range up to 17.1 percent for the USA and 20.6 percent for other (non-Asian) TPP countries, such as Mexico Canada, Peru and Chile.

Table 4-2: Trade-weighted average tariffs faced by Vietnam exports, by sector, 2030 (percent ad valorem)*

	Tariffs imposed by TPP countries			Tariffs imposed by FTAAP and other countries		
	USA	Asia	Other TPP	China[21]	Other FTAAP	All other countries
Rice and other grains	5.6	85.7	1.6	58.4	22.1	13.8
Veg, fruit, nuts basic ag	0.0	0.8	1.8	0.6	26.4	5.4
Fish and livestock	0.4	1.1	0.9	0.0	4.9	3.8
Processed food	1.3	3.9	3.4	4.5	12.0	8.9
Forestry and wood products	0.1	0.1	4.5	0.0	2.2	1.1
Oil, gas, minerals	0.5	0.5	0.0	2.1	1.3	3.9
Textiles, apparel, and leather	17.1	7.7	20.6	5.0	6.6	8.4
Chemicals	2.8	0.5	3.9	10.7	3.2	3.9
Transport and other manufactured	1.2	0.1	5.0	3.2	4.0	2.1
Electrical mach. and metals	1.4	0.1	4.0	5.4	2.1	3.4

** Aggregated sectors are listed in Table 2-1, column IV.*

Source: MacMap2007 and authors' baseline projections, based on assumptions in Table AIII- 2.

Table 4-3 illustrates Vietnam's projected 2030 import tariffs before the TPP tariff cuts are applied. We note that tariffs on processed food, which includes beverages, tobacco and processed food remain relatively high from all sources. Importantly, textile and apparel import tariffs are projected to be modest, but remain above five percent, even with numerous free trade agreements in the Asia region. This is because textiles and apparel are frequently defined as sensitive products using our methodology, and due to their high value shares in trade.

21 Chinese tariffs on imports are scheduled to be reduced under the ASEAN-China and the China–Vietnam FTAs. Our methodology selects one percent of the highest trade value tariff lines as "sensitive" products exempt from reduction. Products exempted by China in our methodology include: rice (60% tariff); petroleum (6% tariff); coffee, selected nuts, cigarettes and starches from vegetables (6-25% tariffs). Notably, many processed and unprocessed rubber products, including footwear, soles of shoes and rubberized boots are defined as "sensitive", using our formula.

Table 4-3: Trade weighted average tariffs imposed by Vietnam, by sector, 2030 (percent ad valorem)*

Sectors**	TPP			Other		
	USA	Asia	Other	FTAPP China	FTAAP Other countries	All other
Rice and other grains	5.1	0.0	3.1	0.0	0.2	5.3
Veg, fruit, nuts basic ag	5.6	0.0	8.2	0.0	3.6	11.2
Fish and livestock	1.5	0.1	0.5	0.1	1.9	7.1
Processed food	8.7	6.0	6.9	0.0	14.4	6.9
Forestry and wood products	0.6	2.3	0.9	0.7	2.4	0.8
Oil, gas, minerals	6.5	7.2	5.3	4.1	5.7	6.2
Textiles, apparel, and leather	8.2	5.1	6.2	6.0	8.4	9.3
Chemicals	2.5	2.4	1.9	0.1	1.6	2.7
Transport and other man	29.1	8.6	4.4	5.0	6.7	16.9
Electrical mach. and metals	2.2	1.1	0.7	0.6	1.8	2.1

** Vietnam tariffs were adjusted to 2013 applied levels employing UN TRAINS data at the HS6 level, from the World Bank Integrated Tariff System.*

*** Aggregated sectors are listed in Table 2-1, column IV and aggregated regions are listed in Table 2-2, column III.*

Source: MacMap2007 and authors' baseline projections based on assumptions in

While tariffs make up a significant part of the TPP for Vietnam, non-tariff barriers are also expected to contribute significantly to the potential impacts of a TPP or FTAAP on Vietnam. We review these measures briefly in the following section.

Non-Tariff Measures

The TPP is being heralded as a comprehensive agreement to cover goods and services trade, tariff and non-tariff measures. Barriers to services trade can include local laws and regulations or licenses and registrations (perhaps only available to local companies), or outright prohibition of foreign-service providers practicing outside their home countries and markets. In goods trade, non-tariff measures can include sanitary and pytosanitary (SPS) regulations and technical barriers to trade (TBT), which might include labeling requirements, testing mandates or other specifications which prove a barrier to importing goods. It is important to note the difference between a non-tariff measure, which is any regulation, applied equally to imports and domestic goods, which might prove a barrier to trade; and non-tariff barriers (NTBs) which specifically reduce imports. Most econometric estimates provided in the literature are NTMs, estimated as ad valorem equivalents (AVEs), and so include measures which restrict trade, regardless of whether they are targeted at imports. We recognize, in line with many of the authors in Table AIII- 2, that some NTMs serve important health and safety roles and are unlikely to be completely eliminated. The challenge is in sorting the NTMs that are deemed protectionist from those NTMs that serve health and safety requirements. Petri et al. (2011 and 2012) and Itakura and Lee (2012) both make assumptions that a portion of the NTM will be removed by the trade

agreement: Petri et al. assume fifty percent of the NTM will remain in place, while Itakura and Lee assume seventy five percent of the NTM will remain in place. We take an alternative approach, which, like the previous authors, recognizes the unlikely elimination of the entire NTM, but also takes into account the benchmark performance of all the parties to the agreement. In the case of TPP services trade, we assume the parties move to the top quintile, or top twenty percent, of the best performers in the TPP region[22]. This means some countries will have to reduce barriers to services trade, while others, which are already performing well, may have to do little to meet the agreement's standards. In this way, barriers are harmonized across the region.

Due to a lack of data for estimation purposes, most data sets omit Vietnam. Therefore, we estimate NTMs for Vietnam using the average of several ASEAN countries, including: Indonesia, the Philippines, and Thailand.

Goods NTMs

Table AIII- 4 includes the ad valorem equivalent of NTMs on goods for each of the APEC members, including Vietnam. These are derived from the World Bank trade restrictiveness estimates provided by Kee et al. (2008a, 2008b and 2009), estimated at the level of manufactures and agriculture.[23]

Table 4-4: Ad valorem equivalent of non-tariff measures on goods trade, Vietnam (percent)

			Reduction to achieve the top quintile of the TPP region	
Country	**Agriculture****	**Manufactures**	**Agriculture**	**Manufactures**
Vietnam**	23.6	5.5	6.4	3.1

** Aggregated sectors are listed in Table 2-1, column III. Agriculture includes processed food.*

*** Estimated using the average of Indonesia, the Philippines and Thailand.*

Source: Kee et al. See appendix

In the case of Vietnam, we list the estimated AVEs of NTMs on goods in Table 4-4. NTMs are estimated to be equivalent to a 23.6 percent tariff for agricultural products and 5.5 percent on manufactures. As mentioned earlier, we do not remove the entire value of the AVE, but harmonize to the best practices in the TPP region. This harmonization will require Vietnam to reduce barriers to imports of agricultural goods equivalent to reducing a 6.4 percent tariff and roughly half that amount on manufactured goods.

22 We note that a quintile can be a purely theoretical number, interpolated between two numbers, or one which recognizes the value of the best performer nearest the quintile (vs. the theoretical quintile, which may not be observed). Here we employ the SAS RANK procedure, which recognizes the observed value as the quintile boundary.

23 We note that HS6 estimates are provided, however, we found too few HS6 estimates to reliably employ the more detailed data. Like other authors, such as Petri et al. we employ the broader estimates.

Services NTMs

Services NTMs are derived from the French research group CEPII (Fontagne, Guillin and Mitaritonna, 2011). CEPII includes estimates of NTMs consistent with several important services sectors found in the GTAP database we use. Some of the highest estimates of services barriers are included in the construction and transport sectors (Table AIII- 5) includes the cuts to the services AVEs required for each country to reach the top quintile of the TPP region.

Table 4-5: Ad valorem equivalents of non-tariff measures on services trade, Vietnam (percent)

Country	Air and other transport	Business, insurance and other financial services	Construction	Government services	Other services	Trade and communication
			AVERAGE VALUE			
Vietnam*	44.2	47.7	56.7	43.5	--	40.6
CUT TO REACH TOP QUINTILE OF THE TPP REGION						
Vietnam	24.6	9.2	10	20.2	--	6.5

**Estimated using the average of Thailand, Indonesia and the Philippines.*

Source: Trade weighted by the authors using MAcMap 2007 database (Bouët et al. 2008).

The range of cuts required to Vietnam's services barriers ranges from a low of 6.5 percent on trade and communication to 24.6 percent on air and other transport (Table 4-5). Data on other services, including recreation, tourism and utilities were not available.

4.2 Free Trade Area of Asia Pacific (FTAAP)

There has been considerable speculation on the potential development of an FTAAP agreement, which could eventually include all 21 APEC members. Before proceeding to consider how any FTAAP agreement might evolve, it is important to recognize the differences between merging FTAs to create new FTAs vs. "docking" onto an existing FTA. When two regional groups negotiate a new FTA, there is no presumption that the rules of either agreement will be included—it is often seen as a new FTA with new rules. However, in a docking situation, an existing regional FTA, such as the TPP, provides the rules and terms that new members accept.

Although there are opportunities to negotiate derogations, the assumption is that the vast majority of the existing terms will be accepted by members docking on to the existing agreement.

Alternative views on how an FTAAP might transpire include:

— Non-TPP APEC members dock onto the TPP individually or in groups;

— China, Japan and -Korea form an FTA (C-J-K FTA) which merges with ASEAN to form an Asian track. TPP members then dock on to the Asian track;

— The TPP and Asian track evolve separately, then negotiate an entirely new FTA with all the members of both groups.

In our study, we narrow the range of options to include docking on to TPP by non-TPP APEC members, both individually and as regional groups (option 1). This is in line with most of the studies in, which include a TPP docking scenario; and given the TPP is well underway and seems likely to outpace other agreements, we view this outcome as more likely than TPP countries docking onto other agreements (option 2). We provide for the evolution of non-TPP agreements in Asia, specifically, and in line with Petri et al., we provide for a new trade agreement between China-Japan-Korea (C-J-K FTA). However, we do not follow the evolution of ASEAN docking onto a C-J-K FTA to form an alternative Asian track. Instead, we assume that China and Korea will dock together onto a TPP along with the ASEAN countries, as two separate blocks. In our study, TPP-12 negotiations are projected to be completed and enter into force (EIF) in 2016. The phase in period is projected to be up to 15 years (10 years for upper and high income countries and 15 years for all other members). Three years after the TPP-12 is completed, the China-Japan-Korea FTA negotiations are projected to be completed in 2018, with a ten year phase-out assumed. Finally, in 2020, C-J-K, ASEAN and other APEC countries dock onto the TPP—accepting the TPP terms and conditions in goods, services, and non-tariff measures.

Our analysis of FTAAP, therefore, embodies many of the same assumptions on tariff and non-tariff barriers as the TPP analysis. The most notable difference is the benefits to non-TPP countries. FTAAP liberalization starts in 2020, with the entry into force of the FTAAP. The benchmarks for tariff cutting remain the same, with one percent sensitive products and phase-outs depending on the level of income (Table 4-1). Importantly, NTM benchmarks, are assumed to be calibrated to the original TPP-12 countries in the areas of goods and services. This means that under a FTAAP, Vietnam will have to lower NTM barriers only to new members, such as China and ASEAN countries, but those countries will have to open their markets to all FTAAP members to an equivalent extent.

In the following sections, we first provide a summary of results from the TPP and FTAAP, then we present separate sections, for each agreement, which explore the result in more detail.

4.3 Overview of TPP and FTAAP Results

The TPP and FTAAP are modeled with many of the same tariff and NTM reductions. The main difference between the two agreements is the timing of the reductions and the membership of the trade agreements (Table 4-6). In the case of TPP, the twelve members initiate tariff and NTM reductions beginning in 2016. For the FTAAP, the nine additional APEC members join the agreement with tariff and NTM reductions beginning in 2020 and meeting the terms of the TPP in the areas of goods and services trade barrier reductions.

Table 4-6: Overview of TPP and FTAAP simulations

Agreement	Tariff	Goods NTMs	Services NTMs
TPP	Reduction of tariffs to zero with 1% sensitive products (approximately 50 HS6 lines); 10 year phase out and 75 percent of lines free on EIF for TPP countries in Group A (see Appendix II), 15 year phase-out and 65 percent of tariff lines free on EIF for TPP countries in Group B (Vietnam). Phase-out starts 2016.	To the top quintile in the TPP region (see Appendix II), phased in over five years from 2016 – 2020.	To the top quintile in the TPP region (see Appendix II), phased in over five years from 2016 -2020
FTAAP	Same as TPP with entry into force January 2016.	Same as TPP, phased in over five years from 2020 – 2024.	Same as TPP region , phased in over five years from 2020 - 2024

Source: Authors' compilation.

Table 4-7 provides an overview of the impacts of the TPP and FTAAP on Vietnam's GDP, export, imports, investment, capital stocks and the trade balance. The results are expressed as cumulative percentage changes from the baseline, with the exception of the trade balance, which is expressed in millions of constant 2007 US dollars. Both TPP and FTAAP increase real GDP from the baseline growth level. In the case of the TPP, by 2020 Vietnam's real GDP grows by a cumulative 3.6 percent above baseline GDP. The FTAAP simulation results in almost the exact same level of 2020 real GDP growth as the TPP, which is largely due to the timing of the FTAAP, with principal tariff and NTM liberalizations assumed to take place from 2020-2035, underscoring the importance of timing when contrasting the results of the TPP with the FTAAP. By 2025, the TPP impacts on Vietnam's GDP have nearly doubled to a cumulative 6.8 percent above baseline growth; this contrasts with FTAAP, which is projected to raise real GDP 11.2 percent above the baseline. By 2035, the TPP will have added 8.1 percent to Vietnam's cumulative real GDP growth while real GDP with FTAAP will be 14.7 percent above the baseline.

Table 4-7: Overview of TPP and FTAAP impacts on Vietnam, 2015-2035 (cumulative percent change relative to mid growth baseline—unless otherwise noted)

	2020		2025		2030		2035	
	TPP	FTAAP	TPP	FTAAP	TPP	FTAAP	TPP	FTAAP
Real GDP	3.6	3.6	6.8	11.2	8.2	14.1	8.1	14.7
Real exports	5.0	5.4	13.4	14.4	16.8	20.3	17.1	23.7
Real imports	7.6	7.5	15.7	17.6	16.0	19.8	14.2	20.2
Real investment	13.6	12.9	21.3	32.2	15.0	27.0	6.3	17.8
Capital stock	3.1	2.9	9.3	11.2	12.9	18.8	11.9	20.1
Change in trade balance (millions US$)	-4,941	-4,648	-9,148	-13,689	-6,051	-11,313	-169	-5,166

Source: Authors' model results and calculations.

Real exports and imports grow under both the TPP and FTAAP scenarios, though, as we will explore in later sections, this growth derives from distinctly different sources. In the case of the TPP, many of the trade impacts for Vietnam are driven by tariff liberalization. However, in the case of FTAAP, many of the trade impacts are driven by goods NTM reductions. By 2035, the Vietnam's trade deficit will have grown modestly under the TPP, but it is noticeably larger under the FTAAP, with the 2035 trade deficit estimated to be 5.2 billion US dollars.

The mirror image of Vietnam's growing trade deficit is investment, which also grows under both scenarios[24]. In the early years of the TPP, real investment in Vietnam grows by 13.6 percent above the 2020 baseline level, peaking by 2025 at 21.3 percent above baseline investment. Under the FTAAP, investment also grows substantially. By 2025, real investment in Vietnam grows by a cumulative 32.2 percent above the baseline. These changes in investment play an important role in determining Vietnam's trade and output composition and growth, as will be discussed in subsequent sections. Changes in investment can impact Vietnam through at least two principal channels in our model:

— It can be a significant source of demand in the Vietnamese economy. As investment changes, demand for investment goods, such as construction and livestock, also change. This places pressure on the price of factors used intensively to produce these goods to rise or fall.

— It will change the endowment of capital. Capital is the accumulation of investment over time, and this accumulation alters the rental price of capital over time.

In the following sections, we explore in detail the results of the TPP and FTAAP on GDP, exports, imports, output, wages and investment. To provide continuity, in the FTAAP section,

24 The relationship between trade and investment can be written as (Savings-Investment) = (Exports-Imports). With savings held relatively constant, investment will adjust for any change in the trade balance.

we present results as relative to the TPP in most cases, since these two agreements are modeled as overlapping.

4.4 TPP Results

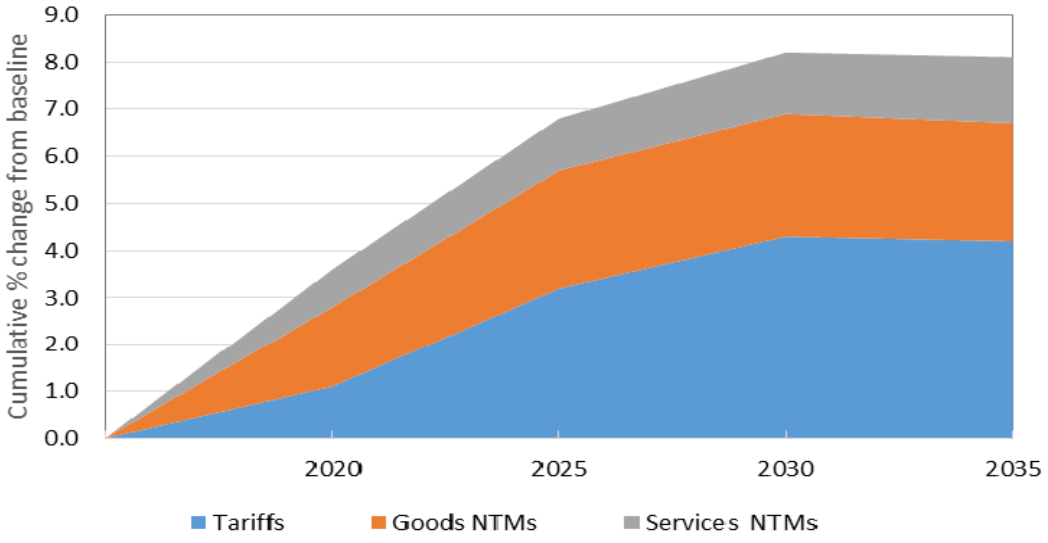
As mentioned earlier, we model TPP as reducing tariffs, along with goods and services NTMs. Table 4-6 provides an overview of the trade liberalization scenario modeled. Tariffs will be phased out over a 10-15 year period, depending on the stage of development of a country (Appendix, Table AIII- 3). Goods and services NTMs are to be reduced over a five year period for all TPP members, starting in 2016. In the following section, we provide an in-depth analysis of key economic variables related to the Vietnam and the TPP including GDP, trade, output, wages and investment.

4.4.1 GDP

The impacts on Vietnam reflect the structure of liberalization in the TPP region. By 2035, real GDP in Vietnam is projected to increase by a cumulative 8.1 percent over the baseline growth projected in the model (Table 4-7).

Figure 4-1 decomposes the impacts of each component of our liberalization scenario over the 2015 – 2035 period. As noted earlier, there is a rapid rise in cumulative real GDP over the 2015 – 2025 period, with real GDP growth peaking at 8.2 percent of real GDP in 2030. The impact of tariffs on real GDP comprises the largest portion of impacts, totaling 52 percent in 2035. Goods NTMs are the next largest category comprising 32 percent of impact on cumulative GDP. Finally, liberalization of services NTMs makes up approximately 16 percent of impacts.

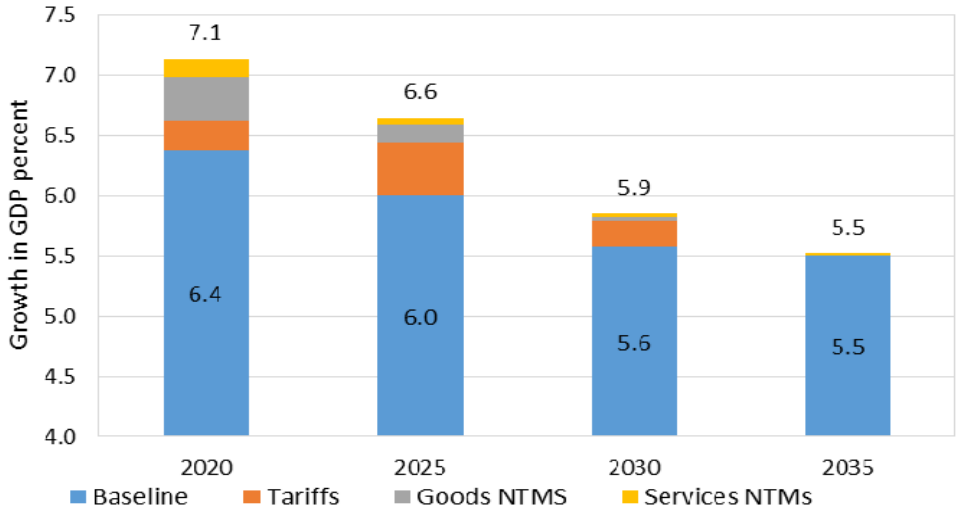
Figure 4-1: Vietnam's change in real GDP due to TPP, 2015-2035 (cumulative percent change relative to mid-growth baseline)



Source: Authors' model results and calculations.

In the baseline, average annual real GDP growth in Vietnam is projected to peak between 2015 and 2020, at 6.4 percent, and then decline to 5.5 percent between 2030 and 2035 (Figure 4-2). At its peak, TPP therefore adds an additional 0.7 percentage points to the average annual real GDP growth. The contribution of tariffs and NTMs, however, differs depending on the period considered. In the early period of 2016-2020, goods NTMs comprise the largest impacts to average annual real GDP. By 2025, tariffs surpass goods NTMs, as the remainder of tariffs are phased out on most TPP countries (subject to sensitive products), and Vietnam continues to phase out its own tariffs through 2030.

Figure 4-2: Vietnam change in real GDP due to Baseline and TPP, by liberalization components, 2020-2035 (average annual growth)*



Source: Authors' model results and calculations. See Table AIII- 9 for details.

**Average annual growth is calculated as the average of the prior five year period (e.g., 2020 includes the average of 2016-2020).*

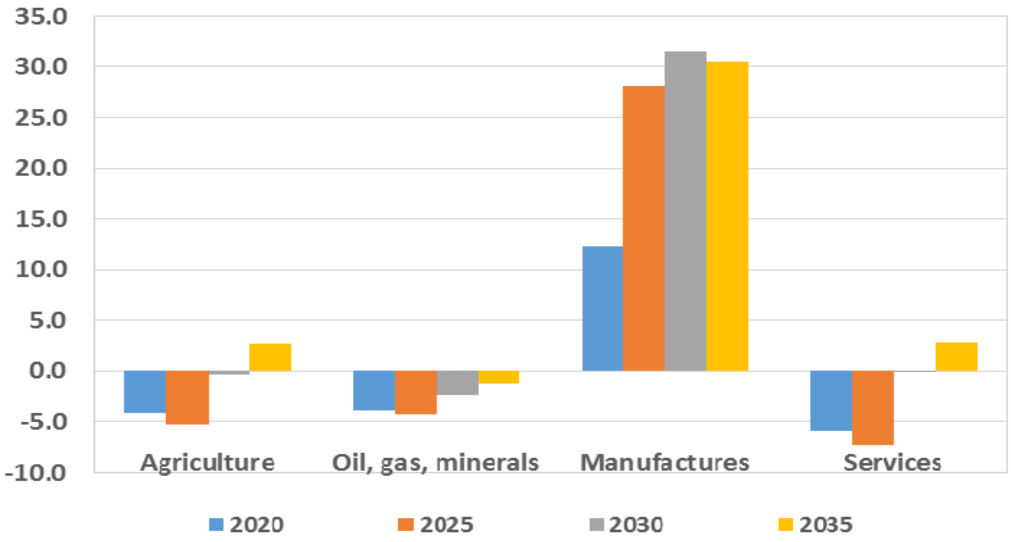
4.4.2 TRADE

In the following section, the impacts of the TPP on international trade are projected.

Exports

Table 4-7 indicates that both exports and imports rise for Vietnam with implementation of the TPP agreement (though the trade balance declined). In this section we review the sectoral composition of the changes in exports and imports. Figure 4-3 illustrates the change in Vietnam's exports due to TPP over the period 2015-2035. Although real exports rise in the aggregate, there are important differences between sectors. In general, manufacture exports increase substantially, approximately 30 percent over baseline in 2035, while all other sectors, agriculture; oil, gas, minerals; and services decline modestly. Both agriculture and services exports are slightly more positive by the end of the period of investigation (2035), as a result of growing capital stocks.

Figure 4-3: Vietnam's change in real exports due to TPP, by major sector, 2020-2035 (cumulative percent relative to mid-growth baseline)*



** Aggregated sectors are listed in Table 2-1, column III. Agriculture includes processed food.*

Source: Authors' model results and calculations.

Table 4-8 includes detailed sectors within these broad groups, their share in 2015 exports and their cumulative real growth over the baseline. Vietnam's agricultural exports are estimated to comprise 15.4 percent of 2015 exports. Nearly all agricultural sectors, from rice, grain to processed food and forestry products (wood) experience a decline in real exports for the period 2015-2025. After 2025, as investment and capital stocks build, and the availability of capital causes capital prices to decline, exports recover somewhat. By 2035, processed food and forestry and wood product exports recover their export positions and are modestly above baseline exports.

Oil, gas and mineral exports, projected to be 16.5 percent of Vietnam's 2015 exports, experience a decline in exports as a result of TPP. These products generally do not face high tariffs in TPP countries (Table 4-2), they are impacted primarily by the rising cost of capital and unskilled labor, which occurs from rising exports of manufactures that also employ these resources intensively.

Manufacturing exports, comprising 58.1 percent of Vietnam's 2015 real exports, generally experience an increase in exports from 2015 – 2035, although chemicals and electrical machinery experience a slight decline in exports through 2020, they quickly recover as capital stocks increase and liberalization continues. Textiles, apparel and leather (including footwear) comprise nearly one-third of projected 2015 real exports. From Table 4-4, it can be seen that tariffs on these products in the TPP region are among the highest, averaging 17.1 percent on US imports of these products from Vietnam to 7.7 percent in the TPP-Asia region and 20.6 percent elsewhere in the TPP region. As a result, Vietnam's exports of textile and apparel products increase by approximately 60 percent above baseline real exports in 2035.

Table 4-8: Vietnam's change in real exports due to TPP, by sector, 2020-2035 (cumulative percent change relative to mid-growth baseline and share of exports 2015)

Sector*	Share of exports 2015	Cumulative percent change from baseline			
		2020	2025	2030	2035
AGRICULTURE					
Rice and other grains	2.4	-4.3	-5.5	-4.5	-4.1
Vegetables, fruit, nuts other basic ag	3.7	-1.3	-2.4	-2.0	-2.0
Fish and livestock	0.3	-7.2	-10.5	-9.7	-5.4
Processed food	5.4	-0.5	-0.5	3.9	7.0
Forestry and wood products	6.0	-8.6	-10.4	-2.6	1.1
PETROLEUM AND MANUFACTURES					
Oil, gas, minerals	16.5	-3.9	-4.2	-2.3	-1.3
Textiles, apparel, and leather	32.9	23.4	56.2	60.3	59.9
Chemicals	5.0	-1.4	0.1	5.2	6.7
Transport and other manufactures	3.9	1.7	4.0	11.2	12.6
Electrical machinery and metals	16.4	-0.6	0.6	6.6	8.0
SERVICES					
Construction, insurance, business services	3.4	-4.9	-6.3	0.7	4.0
Trade, transport and communications	2.6	-2.4	-3.3	2.3	4.6
Other services (govt and private)	1.7	-12.5	-13.3	-3.5	0.0
Total	100.0	4.8	12.5	16.5	17.6

** Aggregated sectors are listed in Table 2-1, column IV.*

Source: Authors' model results and calculations.

An important qualification needs to be considered in our estimates of manufactured exports under the TPP. FTAs generally include rules of origin (ROO) to assure that the benefits of the agreement are limited members of the agreement. These rules assure benefits of an FTA accrue to countries within the FTA by restricting members from minimally processing goods from non-member countries to achieve tariff preferences they might not otherwise be eligible to receive. Rules of origin often specify minimum processing requirements, such as transformation of the goods from one tariff classification to another, or minimum value added content (ASEAN requires at least 40 percent of value added be from that region for members to claim a good as originating from the FTA member). These rules of origin can sometimes be hard for manufactures to achieve, if, for example, they do not have suitable supply chain linkages within their own country or the FTA region.

Of special note is that textiles and apparel often require special rules of origin. In the case of US FTAs a yarn forward rule of origin is employed; this effectively requires three stage transformation of a textile from fiber to yarn (first), weaving or knitting to make fabric (second) and cutting and sewing the fabric into a garment (third) to be eligible to receive preferential tariff rates provided under the US FTAs (value added is not a major factor in US textile and

apparel rules of origin[25]). This stands in contrast to rules of origin which often require a single transformation, such as cutting and sewing fabric to make a garment to obtain originating status. In addition, US agreements often include tariff preference levels (TPLs) which provide some flexibility for producers to employ fabric from outside the FTA region, but they are negotiated on a bilateral basis, there are no general rules for their provision. In our model, we assume that producers are fully able to comply with the rules of origin which would be negotiated under the TPP.

We recognize assumptions defining rules of origin, which can limit preference utilization, would be relatively arbitrary without detailed research on the supply chains involved (by industry) and their prospects under a range of potential rules which will only be revealed when the negotiations are concluded.[26] Since this work is beyond the scope of our study, we instead make clear, our impacts may be less, depending on the rules which are ultimately employed.

Finally, services comprise less than eight percent of Vietnam's exports (see Table 4-8). Services exports, in contrast to agriculture and manufactures, are not directly impacted by tariffs. Instead, in the first five years of the TPP, we model the reduction in services NTMs across the TPP region. While this liberalization might provide greater access for Vietnamese services exports, the increase in wage rates and capital prices due to the rapid rise in manufactures exports diminishes the benefits of greater market access in services. By 2035, all service sectors are modestly higher than baseline growth, as capital stocks increase with a lag, and capital prices decline.

Table 4-9 illustrates the change in Vietnam's exports by destination within the TPP region and elsewhere. We include the baseline 2035 export shares for perspective. Importantly, by 2035, non-TPP countries will comprise 50 percent or more of Vietnam's exports. This reduces somewhat the impacts of TPP on Vietnam. Of the 13 sectors listed in Table 4-9, the USA is the primary destination for seven product groups, with TPP-Asia partners claiming six sectors as the primary destination for Vietnam's exports. This underscores the important role of the US market in the TPP region and in the TPP negotiations. Focusing on textiles, apparel and leather goods, the sector which impacts Vietnam's total exports the most, the USA is the primary destination within the TPP region (20.9 percent) with the highest increase in exports (218.8 percent). These exports become a significant factor in Vietnam's benefits from the TPP.

25 The US often sets maximum values content which may be ignored for origin purposes, but these are limited to findings and trims.

26 Some CGE researchers make assumptions based on analysis, from data on existing regional trade agreements, but as we have noted, defining preference utilization in trade agreements where rules differ widely, and sensitive product exclusions reduce the incentive to utilize trade agreements, creates a tenuous link between existing agreements and projected ones.

Table 4-9: Vietnam's change in real exports due to TPP, by sector and destination, 2035 (cumulative percent change from mid-growth baseline and commodity shares)**

	TPP							
	USA		Asia		Other		Non-TPP	
Sector	Baseline share 2015**	Change	Baseline share 2015**	change	Baseline share 2015**	change	Baseline share 2015**	change
				AGRICULTURE				
Rice and other grains	0.1	-5.3%	6.4	16.7%	0.2	30.3%	93.3	-5.1%
Vegetables, fruit, nuts other basic ag	13.0	-2.7%	5.6	17.4%	4.3	34.1%	77.1	-3.9%
Fish and livestock	24.3	-5.3%	16.2	2.9%	3.1	5.9%	56.4	-8.2%
Processed food	15.2	5.4%	22.9	24.1%	6.4	24.6%	55.5	0.2%
Forestry and wood products	34.0	3.1%	12.7	4.2%	5.5	28.2%	47.8	-2.9%
				PETROLEUM AND MANUFACTURES				
Oil, gas, minerals	6.6	3.2%	32.0	-1.8%	25.2	-0.5%	36.2	-1.8%
Textiles, apparel, and leather	26.4	218.8%	9.5	83.5%	5.1	119.5%	59.0	4.2%
Chemicals	7.9	28.5%	16.4	15.9%	2.7	34.9%	73.0	2.5%
Transport and other manufactures	16.2	17.2%	35.7	15.6%	5.0	58.4%	43.1	3.9%
Electrical machinery and metals	10.8	21.9%	28.4	14.0%	3.3	53.0%	57.4	2.0%
				SERVICES				
Construction, insurance, business services	14.3	23.1%	7.5	12.3%	5.1	30.5%	73.0	-2.4%
Trade, transport and communications	9.5	26.4%	7.8	21.0%	5.5	22.4%	77.2	0.4%
Other services (govt and private)	15.8	-3.3%	7.7	2.9%	6.1	2.9%	70.5	-0.2%

** Aggregated sectors are listed in Table 2-1, column IV.*

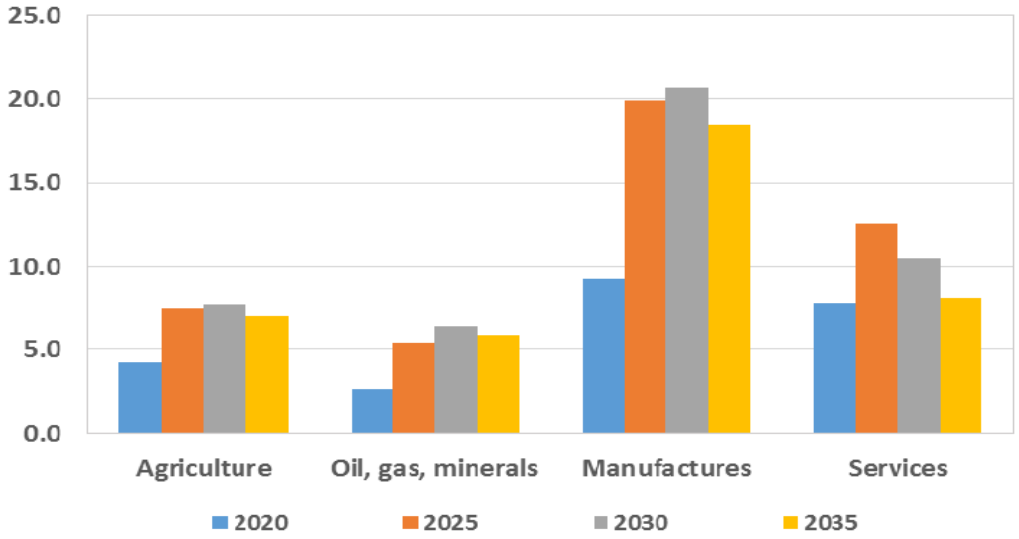
***Share of partner in commodity exports.*

Source: Authors' model results and calculations.

Imports

Figure 4-4 illustrates Vietnam's cumulative change in imports of agriculture; oil, gas, and minerals; manufactures and services. In all cases, Vietnam's imports increase over the baseline. A review of protection in Table 4-3 and NTM measures in Table 4-4 and Table 4-5 suggests a relatively similar level of protection across sectors for Vietnam's imports from TPP countries. Against this information, it is notable that Vietnam's imports of manufactures increase by more than double that of agriculture and services.

Figure 4-4: Vietnam's percent change in real imports due to TPP, by major sector, 2020-2035 (cumulative percent change from mid-growth baseline)*



** Aggregated sectors are listed in Table 2-1, column III. Agriculture includes processed food.*

Source: Authors' model results and calculations.

Table 4-10 lists Vietnam's imports by sector along with their share in baseline 2015 imports. Agricultural products comprise just over 10 percent of total Vietnamese imports, in contrast manufactured imports comprise over two-thirds. Textiles, apparel and leather imports comprise 14.9 percent (more than total agricultural imports) of total Vietnamese imports. Imports of these product grow to over 50 percent of baseline imports, followed by chemicals which rise to 15.4 percent by 2035. The rapid rise in textile, apparel, and leather imports resulting from the TPP, is principally driven by the rise in exports of these products (Table 4-8) and the imported intermediate use of fabric, dyes, and rubber.

Table 4-10: Vietnam's change in real imports due to TPP, by sector, 2020-2035 (cumulative percent change relative to mid-growth baseline and share of 2015 imports)

Sector*	Share of imports 2015	Cumulative percent change from baseline			
		2020	2025	2030	2035
AGRICULTURE					
Rice and other grains	0.6	-1.6	-0.4	1.7	3.6
Vegetables, fruit, nuts other basic ag	1.8	7.7	18.6	20.5	20.3
Fish and livestock	0.5	8.6	11.0	9.3	7.1
Processed food	5.6	3.4	4.6	4.3	3.9
Forestry and wood products	1.8	3.5	5.3	5.3	3.8
PETROLEUM AND MANUFACTURES					
Oil, gas, minerals	12.8	2.6	5.4	6.4	5.8
Textiles, apparel, and leather	14.9	21.5	51.2	54.7	53.8
Chemicals	13.5	6.3	14.8	16.4	15.4
Transport and other manufactures	8.0	5.7	9.7	9.9	7.6
Electrical machinery and metals	29.7	5.3	9.4	9.5	7.0
SERVICES					
Construction, insurance, business services	5.3	7.5	13.3	11.8	9.2
Trade, transport and communications	3.9	6.6	11.1	9.1	6.9
Other services (govt and private)	1.6	11.6	14.0	9.8	7.4
Total	100.0	7.6	15.7	16.0	14.2

** Aggregated sectors are listed in Table 2-1, column IV.*

Source: Authors' model results and calculations.

Table 4-11 illustrates Vietnam's imports by source, TPP and non-TPP countries. We also list the projected share of the source of imports in the baseline for 2035. While imports from the TPP region increase substantially due to the agreement we model, it is important to note the projected share of non-TPP countries as a source of Vietnam's imports. In all sectors, except fish and fish products, non-TPP countries comprise more than 70 percent of Vietnam's imports. Imports of textiles and apparel from the TPP region grow by between 151.3 percent from TPP countries in Asia, to 203.7 percent from the USA. However, these countries, collectively, comprise less than 10 percent of Vietnam's imports of textiles and apparel. Imports of textiles, apparel and leather goods from non-TPP sources increase by 42.5 percent. As mentioned earlier, rules of origin may limit the use of non-regional inputs in the textile, apparel and leather sector. Caution is therefore required when considering these changes. It is impossible to fully determine the impacts without knowing the rules in the TPP agreement and having the data to model these appropriately. The potential for Vietnam to switch the sourcing of fabrics, including to its own domestic manufacturers, and substitute imports for the domestic fabric in domestic production must also be determined.

Table 4-11: Vietnam's change in real imports due to TPP, by sector and source, 2035 (cumulative percent change relative to mid-growth baseline and share of imports by source)

	TPP							
	USA		Asia		Other		Non-TPP	
Sector*	Baseline share 2015**	Change	Baseline share 2015**	Change	Baseline share 2015**	Change	Baseline share 2015**	Change
				AGRICULTURE				
Rice and other grains	13.7	29.5%	1.3	24.4%	34.2	21.0%	50.7	-3.5%
Vegetables, fruit, nuts other basic ag	23.0	70.7%	3.4	33.0%	3.1	96.8%	70.5	9.5%
Fish and livestock	37.3	18.7%	4.6	15.0%	20.2	13.8%	37.9	-1.4%
Processed food	10.4	55.9%	12.0	32.2%	11.9	28.1%	65.7	-10.1%
Forestry and wood products	9.8	25.7%	12.8	40.4%	7.6	28.2%	69.8	-0.3%
				PETROLEUM AND MANUFACTURES				
Oil, gas, minerals	0.7	40.8%	37.5	6.7%	0.3	19.4%	61.4	5.2%
Textiles, apparel, and leather	1.8	203.7%	9.8	151.3%	0.5	188.8%	87.9	42.5%
Chemicals	3.6	45.9%	19.2	42.5%	1.4	47.2%	75.8	10.0%
Transport and other manufactures	5.9	391.6%	11.2	72.2%	0.8	77.4%	82.2	-6.9%
Electrical machinery and metals	2.4	42.9%	16.9	34.1%	3.1	34.5%	77.6	3.9%
				SERVICES				
Construction, insurance, business services	13.1	33.4%	5.3	30.4%	3.1	23.8%	78.4	3.9%
Trade, transport and communications	9.7	57.0%	5.6	29.9%	4.3	54.0%	80.4	-2.3%
Other services (govt and private)	25.9	32.3%	2.3	24.6%	5.1	21.0%	66.7	-0.6%

** Aggregated sectors are listed in Table 2-1, column IV.*

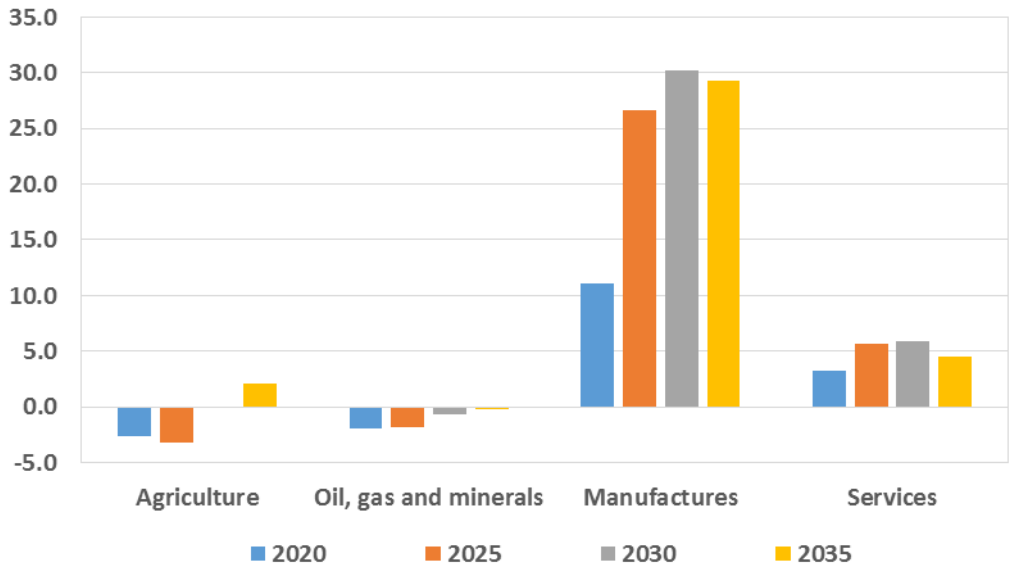
***Share of partner in sector exports.*

Source: Authors' model results and calculations.

4.4.3 OUTPUT AND STRUCTURAL CHANGE

Figure 4-5 lists the projected change in real output by sector, resulting from the TPP. Real output in the manufacturing sector grows by a cumulative 30 percent above the baseline level. Services grow by approximately five percent over the baseline. Agricultural output and oil, gas and minerals both decline slightly from baseline growth, but as investment increases, and capital prices decline, output recovers somewhat.

Figure 4-5: Vietnam's change in real output due to TPP, by major sector, 2020-2035 (cumulative percent change relative to mid-growth baseline)*



** Aggregated sectors are listed in Table 2-1, column III.*

Source: Authors' model results and calculations.

Before reviewing the results in Table 4-12 we review the channels by which changes in output result from our model. Changes in output can arise from:

— direct changes in product and service prices resulting from changes in taxes and regulations, including tariff and non-tariff measures (changing the price wedge);

— indirect changes in product prices resulting from factor costs, in particular, factor prices such as land labor and capital;

— derived demand for goods as inputs into the production of other goods; and

— changes in investment levels.

The first effect, changes in relative prices of goods resulting directly from changes in taxes and protection, are common in most models. For example, if the price of Vietnam's goods, such as textiles, apparel and leather products in the US market decline, as a result of removing the 17

percent tariff on those goods, Vietnam's exports to the USA will rise, holding other factors constant. However, we do not hold other factors constant in our model, as Vietnamese exports of textiles, apparel and leather rise, more capital and labor resources will be required to support those exports and in order to attract those resources into that sector, prices for the resources must rise. This translates into rising costs for most sectors, which is an indirect price effect from the cost of factor inputs. Next, as output of textiles, apparel and leather products rise, the derived demand for cotton, wool, synthetics, fabric, thread and transportation will increase along with the output of the end products.

Since our model is a dynamic model, changes in investment could also have potentially significant effects. Our dynamic model, in contrast to a static model, allows for capital accumulation over time and as the price of capital rises, investment and capital stocks rise. Changing investment and capital stocks have a two pronged effect on factor prices. First, as capital stocks change, the price of capital should also change, relative to a situation where stocks were constant. For example, more capital, holding other things constant, means lower prices (rental rates) on capital, than had the investment not occurred. Second, in order for investment to take place, resources must be channeled into sectors which support the development of capital, including construction, steel, cement etc. This creates a new source of factor demand, which may be significant depending on the level of investment. In the short-run, these two factors may work to counter each other. For example, rising investment will attenuate[27] the rising capital rental costs, while the prices of other factors of production, such as labor, rise to support the rising investment. In the long run, as capital stocks increase, returns to capital diminish, investment decreases, and the two forces work in the same direction, with factor prices declining for capital and non-capital factors of production. These forces should be kept in mind when considering the results in Table 4-12.

Table 4-12 illustrates detailed sector impacts. Within agriculture, most sectors experience a decline in output, except for the fish and livestock sector, which has an increase in output resulting from the TPP. We also note, where there are decreases in agricultural output, they are greatest in the first few years of the TPP, before investment and capital stocks respond, in the long-run 2025-2035, changes in investment and factor costs attenuate the initial decreases in production from baseline growth. In the fish and livestock sectors, output increases in all periods as a result of the TPP. This result follows mainly from the classification of livestock in our model as an input into investment and capital formation (in contrast to other agricultural sectors, livestock is an important component of investment). As will be seen in the following section on investment, there is a strong pull of these resources into the investment sector and this results in growth in the fish and livestock sector.

27 The price of capital may still be rising, but by less than it would have if investment did not take place.

Table 4-12: Vietnam's change in real output due to TPP, by sector, 2020-2035 (cumulative percent change relative to mid-growth baseline)

Sector*	Share in baseline value added 2015	Cumulative percent change from baseline growth			
		2020	2025	2030	2035
AGRICULTURE					
Rice and other grains	6.1	-1.4	-1.9	-1.1	-0.5
Vegetables, fruit, nuts other basic ag	6.1	-1.2	-1.3	-0.7	-0.4
Fish and livestock	7.4	0.3	0.6	1.0	1.9
Processed food	2.8	-1.6	-1.3	2.4	5.3
Forestry and wood products	4.2	-9.2	-10.9	-3.0	0.8
MANUFACTURES AND EXTRACTION					
Oil, gas, minerals	15.4	-2.0	-1.8	-0.6	-0.2
Textiles, apparel, and leather	6.9	22.6	54.8	59.1	58.7
Chemicals	2.5	0.1	2.8	7.0	7.9
Transport and other manufactures	2.5	1.5	5.1	10.2	11.1
Electrical machinery and metals	3.2	-0.4	0.9	6.7	8.0
SERVICES					
Construction, insurance, business services	11.1	7.8	11.6	9.1	5.1
Trade, transport and communications	9.0	2.4	5.2	6.5	6.2
Other services (govt and private)	22.7	-0.3	0.6	2.9	3.3

** Aggregated sectors are listed in Table 2-1, column IV.*

Source: Authors' model results and calculations.

Output of oil, gas and minerals declines mainly as a result of rising resource costs, such as capital and labor and the relative increase in export prices causes exports to decline to non-TPP markets (Table 4-8). As resource costs attenuate, oil, gas and mineral exports recover somewhat in the long run.

Manufactures generally increase output under the TPP. The largest manufacturing sector in Vietnam, textiles, apparel and leather, benefits from a rapid rise in exports to TPP markets and is a principal driver of Vietnam's TPP impacts. Table 4-2 illustrated the high tariffs on these products in the TPP region, and Vietnam's relatively large share in these exports (Table 4-12). In the short run (2020), only the output of electrical machinery declines slightly, all other manufacturing sector output increases. In the long run, output continues to increase, as capital stocks increase and factor prices diminish, except for textiles, apparel and leather products, which see a slight decline by 2035 resulting from other sectors competing for resources.

Services sectors, like manufactures, also see increases in output in most areas, in the short run except in other services (including government services). In the cases of construction, trade, transport and communications, they are all important to investment and are heavily influenced by growth in that sector. Therefore, changes in output in these sectors are strongly influenced

by what is happening in investment. Construction, in particular, is the largest component of investment, and its growth tracks investment closely (Table 4-7).

4.4.4 WAGES AND RENTAL RATES

The previous section projected sectoral changes in output for Vietnam. Since sectors use labor with different intensities, it is expected that employment and wages will be impacted by these shifts in output. Table 4-13 illustrates the cumulative change in employment by the five labor categories in our model. For all types of labor, employment is reduced in all sectors except manufactures which grows significantly.

Focusing on manufactures, low skilled and managers and professionals are impacted the most by the TPP, since manufactures employs these two groups relatively intensively. Baseline 2015 labor shares indicate that manufactures comprise nearly 20 percent of employment in these two categories. In the case of low skilled labor, agriculture provides the largest share of additional workers to support the expansion in manufactures output, while services sectors provide the largest number of managers and professionals.

Figure 4-6 illustrates the cumulative percent change in wages and rental rates for labor, capital, land and natural resources. Evident in Figure 4-6 is the relatively large increase in wage rates for all types of labor, relative to land, natural resources and capital it is also clear that wages grow the most in the 2025-2030 periods. Low skilled labor has the highest growth in wages, peaking at over 10 percent above baseline in 2025. The rental rate on capital, in contrast, peaks in the first years of the TPP (2020-2025), then declines and even impacts negatively on prices in later years, as capital stocks expand.

Table 4-13: Vietnam's change in labor demand due to TPP, by major sector*, 2035 (cumulative percent change relative to mid-growth baseline and share of workers I sector)

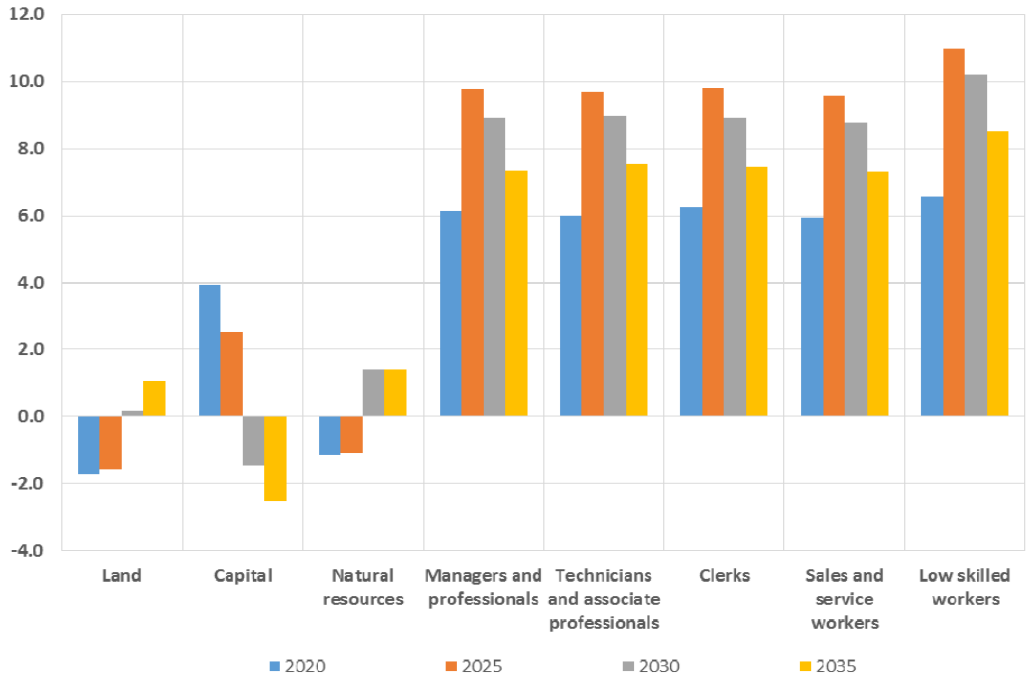
	Managers and professionals		Technicians and associate professionals		Clerks		Sales and service workers		Low skilled	
Sector**	Share workers in sector (2015)*	Cum difference 2035	Share workers in sector (2015)*	Cum difference 2035	Share workers in sector (2015)*	Cum difference 2035	Share workers in sector (2015)*	Cum difference 2035	Share workers in sector (2015)*	Cum difference 2035
Agriculture	7.2	-1.5	1.7	-1.7	4.0	-1.7	7.0	-1.5	55.3	-2.6
Oil, gas, and minerals	7.2	-3.0	1.1	-3.1	5.2	-3.0	5.9	-2.9	9.8	-3.5
Manufactures	18.5	22.6	4.2	22.2	8.4	22.3	14.3	22.5	19.8	20.9
Services	67.1	-2.7	93.0	-2.5	82.5	-3.5	72.9	-3.2	15.1	-4.0

** Based on number of workers.*

** Aggregated sectors are listed in Table 2-1, column III. Agriculture includes processed food.*

Source: Authors' model results and calculations.

Figure 4-6: Vietnam's change in real wages and rental rates for labor, capital, land and natural resources due to TPP, 2020-2035 (cumulative percent change relative to mid-growth baseline)*



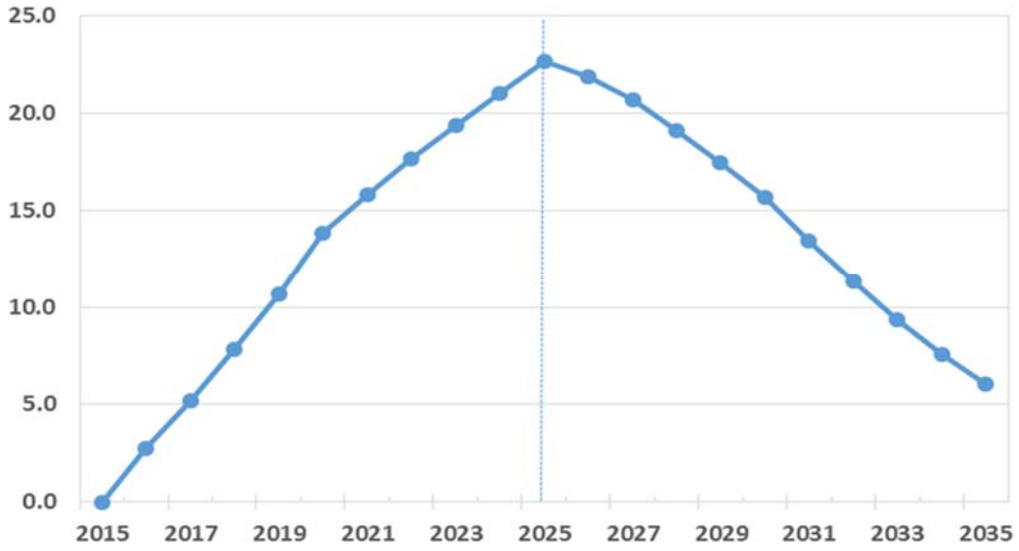
** Endowments listed in Table AI- 3. Based on number of workers.*

Source: Authors' model results and calculations.

4.4.5 INVESTMENT

As mentioned in the overview section, investment can be a significant driver of impacts both because of its derived demand for inputs and its effects on factor prices, in particular, capital rental rates. Figure 4-7 illustrates the projected cumulative percent change in Vietnamese investment goods. Investment increases relative to the baseline from 2015 through 2025, peaking at nearly 23 percent above the baseline. The rise in investment is driven by the increasing rate of return on investments, which is a function of capital costs and the rental rate of capital, which are in turn influenced heavily by the rise in manufacturing exports to TPP markets.

Figure 4-7: Vietnam's change in real investment due to TPP, 2015-2035 (cumulative percent change relative to mid-growth baseline)



Source: Authors' model results and calculations.

4.5 FTAAP Results

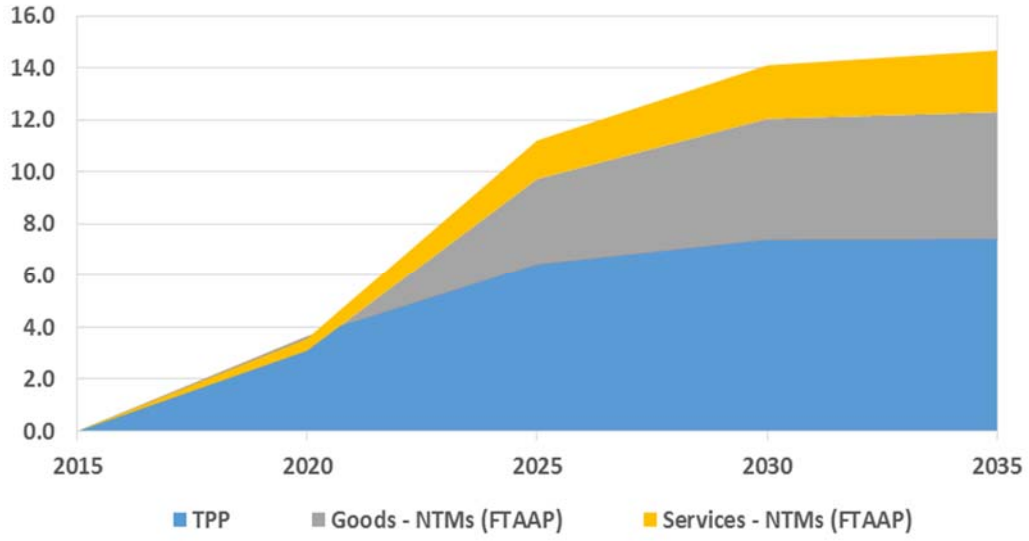
The Free Trade Area of Asia and the Pacific, as reviewed earlier, will result in a wider regional trade area in contrast to the TPP alone. In our version of FTAAP, nine new countries will join the TPP members to form a free trade area which now includes 21 countries. Most significantly, FTAAP will include China joining with TPP members. This is significant, not only because of the size of China, but also because of its export structure, which is similar to Vietnam in the area of light manufactures, such as textiles, apparel and footwear. Many of the new members in the FTAAP will be countries which Vietnam has already signed FTAs with—ASEAN members such as Indonesia, the Philippines, and Thailand and other Asian countries such as Korea and Hong Kong, which it has also signed FTAs with. They also include several countries Vietnam has not concluded an FTA with such as Republic of China (Taiwan) and Russia. While Vietnam has FTAs with many of these countries, it is important to note that we model aggressive reductions in goods and services NTMs which provide market access in these areas which go beyond the tariff concessions in FTAs. We apply many of the same TPP terms to the FTAAP; the main difference being that FTAAP members begin their phase out starting in 2020, in contrast to the TPP members who begin their phase out in 2016. It is also important to note that we include a phase out of tariffs between China-Korea-Japan, starting in 2018.

In contrast to the earlier analysis of TPP, we provide many of our results as differences from the TPP projections, in contrast to the baseline, since these two trade agreements are projected in our scenario to take place together. This highlights the incremental effect of the FTAAP from the TPP. The following sections review the impact of a potential FTAAP on Vietnam.

4.5.1 GDP

Figure 4-8 illustrates how the implementation of an FTAAP agreement may augment the gains from TPP for Vietnam's cumulative real GDP to 2035. The TPP impacts are reported and decomposed earlier; our focus here is on the additional impacts of the FTAAP agreement. Over the period 2015-2020, the incremental impacts of the FTAAP are minimal and are limited to the first year of the agreement and the China-Korea-Japan FTA. The tariff cuts lead to slightly negative impacts on Vietnam's real GDP, but these are largely offset by a slight increase in real GDP due to the initial liberalization of goods NTMS. In general, the overall negative impacts of tariff reductions on Vietnam's real GDP reflect the erosion of preference margins in TPP markets, including the USA. In contrast to the TPP, the main driver of impacts for Vietnam in the FTAAP is the elimination of goods and services NTMs in the FTAAP region, on non-TPP economies, such as ASEAN and China. By 2035, Vietnam's real GDP under an FTAAP agreement is projected to be nearly 15 percent greater than baseline growth. This amounts to something less than doubling the impacts of the TPP, which contributes 8.1 percent to real cumulative GDP growth by 2035. While the overall impact of tariffs reductions in FTAAP is negative relative to TPP liberalization alone, the following sections will show that these tariff reductions can have important and differentiated impacts at the sector level.

Figure 4-8: Vietnam's change real GDP due to FTAAP, 2015-2035 (cumulative percent change relative to TPP)



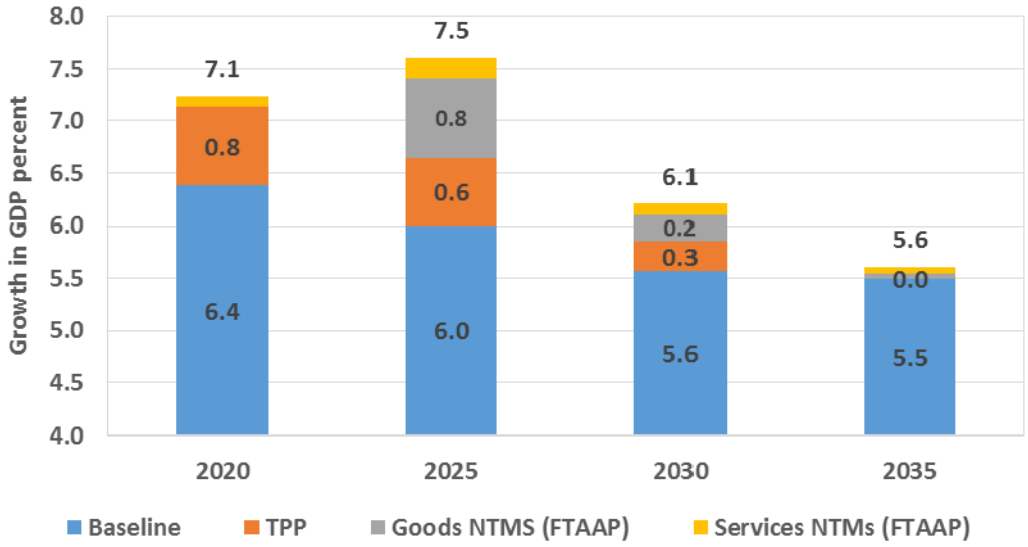
Source: Authors' model results and calculations.

Note: Tariff effects are slightly negative and are seen as a slight drop down of the services trend between 2015 -2020. Otherwise, these effects are not obvious in this chart.

Figure 4-9 illustrates the impact of the TPP and FTAAP on Vietnam's average annual GDP from 2020-2035. Each bar represents the average annual increase in GDP over the prior five year period. Absent from the graphs are indications of tariff liberalization under the FTAAP. These impacts are slightly negative, but negligible; they are omitted from the graphs to enhance readability but are included in the totals presented. In 2020, average annual GDP is slightly higher with the FTAAP than with TPP alone. Goods NTMs play a role in this first period, if

only for one year, but are offset by changes due to the China-Korea-Japan FTA, which is also included in our FTAAP simulation (from 2018). By 2025, average annual GDP under the FTAAP has grown by 7.5 percent. The role of goods NTMs as the predominant contributor to the additional GDP growth under FTAAP is apparent. Our NTM phase out period is for a five year period for all members of FTAAP (in this case the new members of TPP), covering the period 2020-2024. This means that by 2030, the contribution of these benefits to average annual GDP diminishes as their impact on average annual growth becomes a matter of the past—however, as illustrated in Figure 4-8, overall cumulative GDP is higher relative to baseline growth and projections that include TPP.

Figure 4-9: Vietnam's change in real GDP due to Baseline, TPP and FTAAP Baseline and TPP, by liberalization components, 2020-2035 (average annual growth*)



Source: Authors' model results and calculations. See Appendix Table AIII- 10.

**Average annual growth is calculated as the average of the prior five year period (e.g., 2020 includes the average of 2016-2020).*

Note: Tariff impacts were small, and are not illustrated, they are included in the total average annual GDP growth.

4.5.2 TRADE

In the following section, the impacts of the FTAAP on Vietnam's international trade are projected. Since the TPP and the FTAAP are modeled together, as one agreement, and the TPP results were provided earlier in this paper, results are reported as the difference between TPP and FTAAP. This is equivalent to incorporating the TPP into the baseline. We also omit the impacts prior to 2020 from the discussion; while we model the China-Korea-Japan FTA starting in 2018, and the FTAAP implementation in 2020, these results are small and generally reflect the modest impacts and interaction with the China-Korea-Japan FTA, which is not a significant driver of impacts on Vietnam Figure 4-9 illustrates the modest impacts of all components of FTAAP, including the China-Korea-Japan FTA).

Exports

Table 4-2 lists tariffs faced by Vietnam in the FTAAP region. While Vietnam has concluded free trade agreements with many Asian countries (ASEAN, China, and South Korea), high tariff rates remain a significant factor in Asia. Our analysis estimates sensitive products of between one and five percent remain, even when an FTA is concluded. For example, considering the tariffs Vietnam will face on its exports to China, tariff rates are low, but remain significant in areas such as rice (58.4 percent), processed food (4.5 percent), textiles, apparel and footwear (5.0 percent) and chemicals, rubber and plastics (10.7 percent)[28]. In the remainder of the non-TPP FTAAP region, tariffs remain high on rice (22.1 percent), vegetables, fruits and nuts (26.4 percent), processed food (12.0 percent) and textiles, apparel and footwear (6.6 percent). So while tariffs are lower than they might otherwise have been in the region without numerous FTAs, given our assumptions on sensitive products, the tariffs can still be significant, though their impacts tend to be product specific (derived from sensitive product lists), rather than broad based as in the case of the TPP (where in certain countries, such as the USA, there are fewer trade agreements between that country and Asian countries).

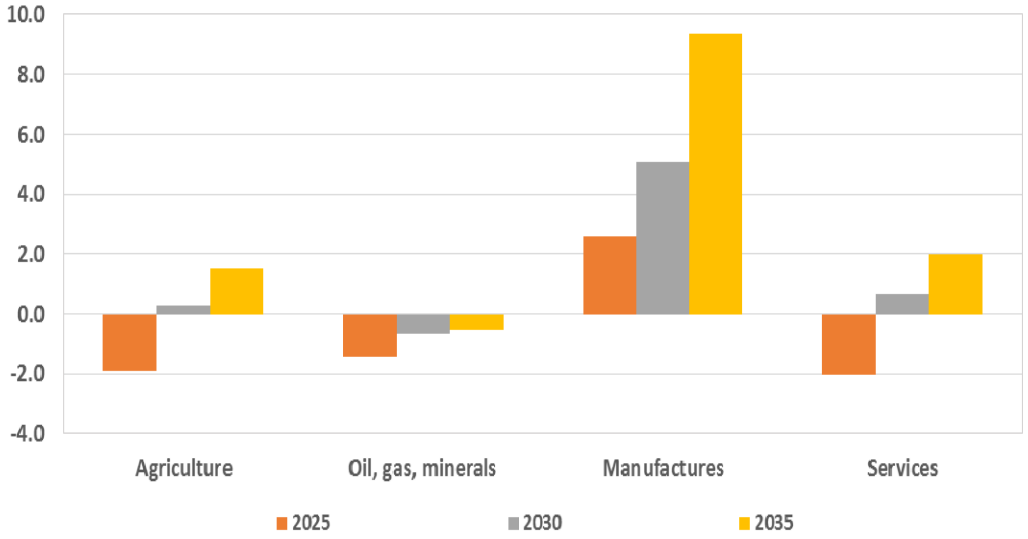
Non-tariff measures on goods and services trade are also projected to be reduced in the non-TPP FTAAP region. Appendix Table AIII- 4 lists the goods non-tariff measures in the FTAAP region. In the scenario we model, countries such as China, the Philippines and Taiwan are projected to reduce non-tariff measures when they join the FTAAP. Table AIII- 5 lists the ad valorem equivalent of services trade barriers, which are significant for most the of non-TPP FTAAP members. We note that in this scenario, Vietnam will be required to reduce its goods and services NTMs to non-TPP FTAAP members starting in 2020.

Figure 4-1 illustrates the cumulative change in Vietnam's real exports by sector.[29] Importantly, the cumulative changes are shown as differences from real exports under the TPP. As with the results in the TPP, exports of most sectors decline in the short-run and then recover as investment and capital stocks grow. Again, manufactured exports show the largest increase in real exports, with growth of over eight percent above the case of TPP alone.

28 We note, according to the World Integrated Tariffs Systems (WITS), rice tariffs on Chinese imports from Vietnam have changed little in recent years, with preferential rates specified at 65.5 percent on most Chinese imports of rice, validating our sensitive product selection, however, without access to detailed tariff line information from the trade negotiations, it is impossible to verify the specification of rice as a sensitive product in any of Vietnam's trade negotiation. Chemical tariffs which remain high are on rubber soles and rubber materials, again, signaling the sensitivity of this product.

29 We do not include the five year period prior to 2020, since the FTAAP enters into force in 2020.

Figure 4-10: Vietnam's change in real exports due to FTAAP, by major sector, 2025 -2035 (cumulative percent change relative to TPP)



** Aggregated sectors are listed in Table 2-1, column III. Agriculture includes processed food.*

Source: Authors' model results and calculations. See appendix Table AIII- 11.

Table 4-14 presents detailed sector results on Vietnam's real exports over the 2020-2035 period. In agriculture, in the short run (2025) all sectors register a decline except rice, and other grains and fish and livestock. Rising factor costs for labor and capital are major factors causing Vietnam's exports to decline. However, in the case of rice and other grains, there is strong growth. This results from significant growth in rice exports to China, which face an average tariff of 58.4 percent. While we allow for one percent sensitive products in FTAAP, one tariff line, for rice is selected out for tariff elimination under FTAAP. This underscores the importance of sensitive products within the negotiations. The overall impact of this large percent increase in rice exports is dampened by its low level in trade, so its impact on the Vietnamese economy is minimal. In the case of fish and livestock, initially growth in investment (livestock is a minor component in investment) ameliorates the reduction in competitiveness from rising factor costs. In the medium term, these exports decline. In all cases, except rice and grain exports, long-run results reflect the easing of resource costs from decreasing investment and rising capital stocks.

Table 4-14: Vietnam's change in real exports due to FTAAP, by sector, 2025 -2035 (cumulative percent change relative to TPP and share of exports 2020)

Sector*	Share of exports baseline 2020	Cumulative percent change from TPP		
		2025	2030	2035
AGRICULTURE				
Rice and other grains	2.0	4.7	10.3	8.8
Vegetables, fruit, nuts other basic ag	3.0	-1.2	-2.0	-1.9
Fish and livestock	0.4	0.0	-1.6	-0.1
Processed food	5.8	-1.2	1.1	3.1
Forestry and wood products	6.4	-4.7	-1.8	-0.3
PETROLEUM AND MANUFACTURES				
Oil, gas, minerals	14.4	-1.4	-0.7	-0.5
Textiles, apparel, and leather	31.2	1.2	2.0	7.4
Chemicals	5.8	4.6	9.1	11.6
Transport and other manufactures	4.4	4.5	7.7	9.9
Electrical machinery and metals	17.6	4.9	9.4	12.0
SERVICES				
Construction, insurance, business services	4.3	-1.1	1.6	2.8
Trade, transport and communications	2.8	-0.4	1.2	2.0
Other services (govt and private)	2.1	-5.9	-1.4	0.8
Total	100.0	0.9	3.0	5.7

** Aggregated commodities listed in Table 2-1, column IV.*

*Source: Authors' model results and calculations. See appendix Table AIII- 11****Error! Reference source not found.****.*

Oil, gas and mineral exports, as in the case of TPP, experience a decline in short-run exports (2020-2025), though in the long run these declines are reduced as resources are augmented and reallocated as a result of investment. All Vietnamese manufacturing sectors increase their exports under the FTAAP, both in the short and long run. The increase in textiles, apparel and leather exports is notable, since Vietnam's largest export sector is projected to come under increasing pressure in its largest Asia-Pacific market, the USA. As China and other ASEAN countries join the FTAAP, Vietnam's tariff preference to that market will be reduced, giving rise to increased competition. Indeed Table 4-15 shows that by 2035, Vietnam's exports of these products to TPP members, including the USA, decline by 15 percent relative to the TPP scenario. However, Vietnam's loss in exports of these products to its traditional markets is more than compensated by access to other markets in non-TPP countries. As was reviewed earlier, textiles, apparel and leather product tariffs still remained high prior to implementation of our FTAAP scenario, due to these products being classified as sensitive products. In addition, the elimination of goods non-tariff measures provides additional market access over prior regional agreements. The reduction in regional sourcing costs resulting from reductions in goods NTMs is projected to be strong enough to increase Vietnam's exports to non-FTAAP markets. In other manufacturing sectors, where erosion of preferences in the USA are not as significant, and

NTMs impacts are once again prominent, Vietnam's exports increase to all destinations in the short, medium and long run (Table 4-14). Services exports to TPP countries under the FTAAP generally decline in the short run but recover, to slightly above the TPP scenario results.

Finally, Table 4-15 illustrates Vietnam's real exports by destination in 2035. Once again, cumulative percent changes in exports are measured from the TPP. Notable in agriculture is the 945 percent increase in exports of rice from Vietnam to China under the FTAAP. As mentioned earlier, this result stems from China's tariff protection on these products and their prior selection as sensitive products in earlier agreements, but their partial liberalization under FTAAP. Still, rice exports to China comprise only 1.6 percent of Vietnam's exports of rice and grains, with rice and grains comprising less than two percent of Vietnam total exports, therefore, the impact of this large percent increase in rice exports is small in real terms when measured against total trade.[30] Exports of agricultural products to the TPP region and non-FTAAP countries decline as a results of increasing costs of production and to resources being diverted to manufacturing sectors.

Manufactures to all destinations, except textiles, apparel and leather products, increase reflecting the increased cost efficiencies from lower tariffs and goods NTM costs in the FTAAP region. As discussed earlier, textile, apparel and leather products exported to the TPP region decline with FTAAP liberalization. Vietnam's exports of these products to the USA experience a reduction in margin of preference as China and other ASEAN countries enter the USA market. Service exports to all non-TPP FTAAP markets increase with the removal of services NTMs. Notable is the large increase in Vietnam's exports of construction services to China, which derive from the relatively large reduction in services NTMs on business, insurance, and other financial services (Table AIII- 5).

30 This also explains why, despite some large product level tariff liberalization in the FTAAP, the overall impact of tariffs is negligible.

Table 4-15: Vietnam's change in real exports due to FTAAP, by sector and destination, 2035 (cumulative percent change relative to TPP and share in baseline exports)

	FTAAP						Other	
	China		TPP		Other			
Sector*	Share of baseline exports 2020**	FTAAP	Share of baseline exports 2020**	FTAAP	Share of baseline exports 2020**	FTAAP	Share of baseline exports 2020**	FTAAP
AGRICULTURE								
Rice and other grains	1.5	944.5%	6.0	-28.8%	78.8	-2.6%	13.7	-29.8%
Vegetables, fruit, nuts other basic ag	38.0	-5.1%	19.6	-7.5%	13.4	34.1%	29.0	-13.1%
Fish and livestock	10.0	-8.2%	42.9	-4.2%	25.6	19.3%	21.5	-6.3%
Processed food	7.2	12.2%	43.0	-6.1%	22.6	30.6%	27.2	-5.3%
Forestry and wood products	18.6	7.5%	50.0	-4.8%	5.8	20.1%	25.7	-2.4%
PETROLEUM AND MANUFACTURES								
Oil, gas, minerals	25.2	9.1%	61.1	-8.1%	10.4	0.5%	3.3	-8.1%
Textiles, apparel, and leather	5.8	76.7%	37.7	-15.8%	11.2	54.2%	45.2	19.6%
Chemicals	24.1	17.8%	25.6	1.6%	19.2	24.2%	31.1	4.2%
Transport and other manufactures	2.5	24.2%	55.8	6.2%	12.1	29.8%	29.5	7.9%
Electrical machinery and metals	16.0	19.8%	39.3	1.8%	22.7	28.3%	22.0	4.1%
SERVICES								
Construction, insurance, business services	4.3	121.7%	26.1	-4.6%	7.8	27.2%	61.8	-3.3%
Trade, transport and communications	8.5	27.5%	21.5	-8.7%	10.1	23.0%	59.9	-1.8%
Other services (govt and private)	2.5	17.4%	28.1	1.3%	8.1	11.4%	61.3	-1.2%

** Aggregated sectors listed in Table 2-1, column IV.*

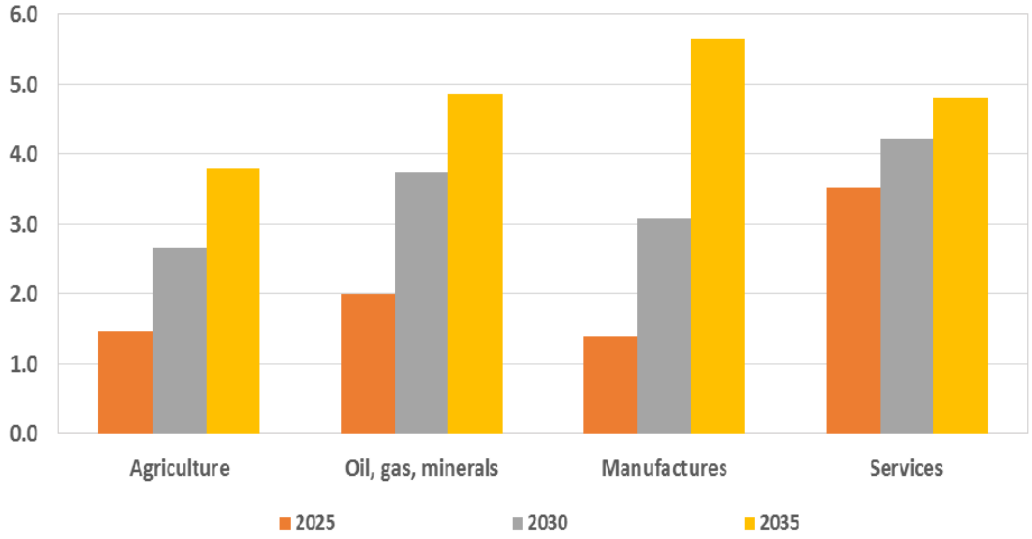
***Share of partner in commodity exports.*

Source: Authors' model results and calculations

Imports

Figure 4-11 illustrates the impact of FTAAP on Vietnam's imports relative to the TPP. Imports from all sources increase in comparison to the TPP. This is a result of reductions in goods and services NTMs and rising factor costs in Vietnam.

Figure 4-11: Vietnams change in real imports due to FTAAP, by major sector, 2025 -2035 (cumulative percent change relative to TPP)*



** Aggregated sectors are listed in Table 2-1, column III. Agriculture includes processed food.*

Source: Authors' model results and calculations. See appendix Table AIII- 12.

Table 4-16 provides sector level details of Vietnam's imports, showing that each sector follows the trend of the overall growth in imports. Again, broad reduction in NTMs and increasing factor costs in Vietnam contribute to these broad based changes in imports. A notable deviation from this broad result is for textiles and apparel in the short and medium run, where imports decline. In fact, when only textiles are considered, the import trend is the same for other Vietnamese imports-they increase. It is only when considering the predominating effect from wearing apparel that things look differently. The decrease in production costs for wearing apparel are so great (due to a decline in textile intermediate input costs) that the price of wearing apparel in Vietnam becomes more competitive and displaces imports of wearing apparel, causing a decrease in imports for this product in the short and medium term.

Table 4-16: Vietnam's change in real imports due to FTAAP, by sector, 2025-2035 (cumulative percent change relative to TPP)

Sector*	Share of baseline imports 2020	Cumulative percent change from TPP		
		2025	2030	2035
AGRICULTURE				
Rice and other grains	0.5	2.2	6.9	9.2
Vegetables, fruit, nuts other basic ag	1.9	0.5	1.8	5.0
Fish and livestock	0.6	3.6	4.9	4.9
Processed food	5.3	1.4	2.2	2.6
Forestry and wood products	2.0	1.6	2.7	3.4
PETROLEUM AND MANUFACTURES				
Oil, gas, minerals	12.4	2.0	3.7	4.9
Textiles, apparel, and leather	14.6	-1.0	-0.3	4.8
Chemicals	13.0	0.7	2.7	5.2
Transport and other manufactures	8.4	2.7	4.4	5.6
Electrical machinery and metals	28.8	3.1	5.2	6.5
SERVICES				
Construction, insurance, business services	5.9	3.8	4.6	5.2
Trade, transport and communications	4.6	2.5	3.4	4.1
Other services (govt and private)	1.8	5.2	5.0	5.1
Total	100.0	0.9	3.0	5.7

** Aggregated commodities listed in Table 2-1, column IV.*

Source: Authors' model results and calculations.

Table 4-17 shows that the majority of Vietnam's increased imports are from non-TPP FTAAP sources. In most cases, imports from TPP countries decline as their margin of preferences are eroded by non-TPP FTAAP members receiving preferential access due to reductions in NTMs. A notable exception is, again, textiles and apparel, where imports from FTAAP countries other than China increase. Again this is a result of our projection of a relatively high number of textiles and apparel products defined as "sensitive" under prior FTA agreements Vietnam engaged in. In particular, the AFTA provided a higher level of "sensitive product" exclusions, which we projected to be principally allocated to the textile, apparel and footwear sectors. The FTAAP requires many of those products to be scheduled for tariff elimination and so goes beyond the prior ASEAN agreement.

Table 4-17: Vietnam's change in real imports due to FTAAP, by sector and destination, 2035 (cumulative percent change relative to TPP and share of imports 2020)

	FTAAP						Other	
	China		TPP		Other			
Sector*	Share of baseline imports 2020**	FTAAP	Share of baseline imports 2020**	FTAAP	Share of baseline imports 2020**	FTAAP	Share of baseline imports 2020**	FTAAP
AGRICULTURE								
Rice and other grains	17.2	31.3%	42.9	-12.2%	14.9	22.0%	25.0	3.7%
Vegetables, fruit, nuts other basic ag	6.1	23.8%	26.9	-6.7%	8.4	11.6%	58.6	7.4%
Fish and livestock	1.1	11.3%	59.1	-5.9%	17.8	23.0%	22.0	13.7%
Processed food	4.1	10.4%	32.5	-10.4%	19.2	38.3%	44.2	-2.2%
Forestry and wood products	21.2	16.2%	25.1	-7.6%	16.3	17.5%	37.4	-4.8%
PETROLEUM AND MANUFACTURES								
Oil, gas, minerals	18.6	-1.1%	36.5	7.3%	43.3	12.5%	1.6	7.3%
Textiles, apparel, and leather	29.6	-7.0%	11.5	-26.7%	50.7	24.5%	8.2	-23.4%
Chemicals	32.8	9.9%	22.2	-12.4%	30.5	16.4%	14.5	-8.6%
Transport and other manufactures	52.3	9.2%	12.8	-14.6%	26.0	18.6%	8.9	-9.5%
Electrical machinery and metals	52.5	11.1%	16.7	-13.6%	19.8	15.7%	11.0	-8.0%
SERVICES								
Construction, insurance, business services	3.9	20.4%	22.0	-3.3%	6.8	37.7%	67.2	3.1%
Trade, transport and communications	8.4	51.6%	19.9	-16.5%	10.9	58.6%	60.8	-9.3%
Other services (govt and private)	29.5	8.7%	31.9	-2.6%	2.4	58.6%	36.2	4.5%

** Aggregated sectors listed in Table 2-1, column IV.*

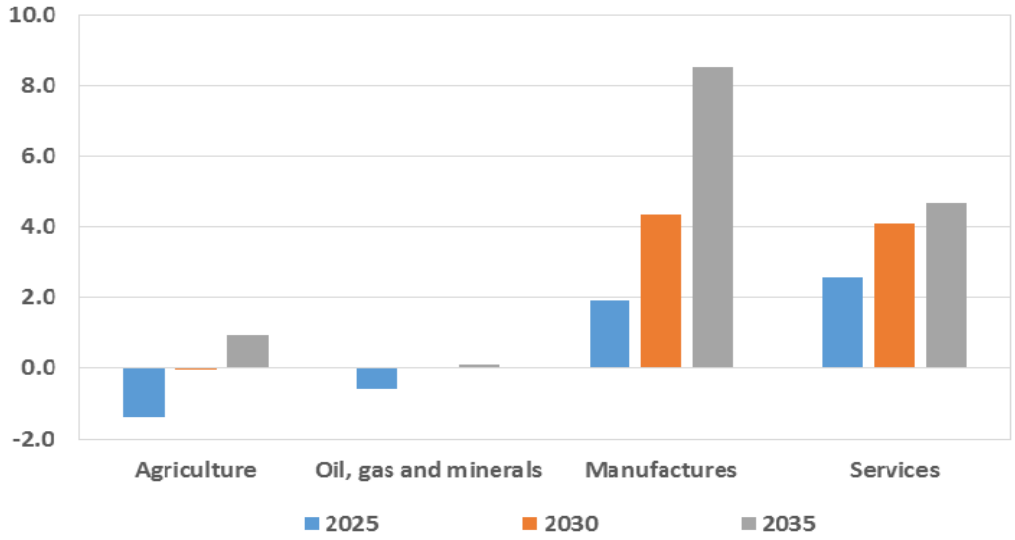
***Share of partner in sector exports.*

Source: Authors' model results and calculations

4.5.3 OUTPUT AND STRUCTURAL CHANGE

Figure 4-12 illustrates the cumulative change in Vietnam's output by sector relative to output under the TPP. As in the case of the TPP, output of manufactures and services increase, albeit the gains to manufactures are much smaller, and output in the agriculture, oil, gas and minerals sectors are modestly impacted. For all sectors, as capital stocks increase, the rental price for capital deceases, so in the long run, output increases when compared with the TPP.

Figure 4-12: Vietnam's change in real output due to FTAAP, by major sector, 2025-2035 (cumulative percent change relative to TPP)*



** Aggregated sectors are listed in Table 2-1, column III. Agriculture includes processed food.*

Source: Authors' model results and calculations

Table 4-18 illustrates detailed sector impacts of the FTAAP relative to the TPP. In agriculture, output of rice and other grains increases due to the increase in exports of these products to China. Fish and livestock, once again, increase due to livestock's role in investment goods. All manufacturing sectors see an increase in output as a result of the FTAAP. The removal of NTMs on goods in the FTAAP region and Vietnam's own liberalization all contribute to growth. A similar result follows for the services sectors, which all see an increase in output.

Table 4-18 Vietnam's change in real output due to FTAAP, by sector, 2025-2035 (cumulative percent change relative to TPP)

Sector*	Share in Value added baseline 2020	Cumulative percent change from baseline growth		
		2025	2030	2035
AGRICULTURE				
Rice and other grains	5.1	1.0	2.8	2.3
Veg, fruit, nuts basic ag	4.7	-1.5	-2.0	-1.6
Fish and livestock	6.3	0.3	0.6	1.2
Processed food	2.9	-1.6	0.1	1.9
Forestry and wood products	4.8	-5.1	-2.0	-0.6
PETROLEUM AND MANUFACTURES				
Oil, gas, minerals	15.6	-0.6	0.0	0.1
Textiles, apparel, and leather	6.9	0.7	1.5	6.9
Chemicals	2.4	2.7	6.9	9.6
Transport and other man	2.2	2.2	5.3	7.3
Electrical mach. and metals	3.1	4.5	8.9	11.6
SERVICES				
Construction, insurance, business services	12.7	5.5	6.7	6.7
Trade, transport and communications	9.5	1.0	2.2	2.9
Other services (govt and private)	24.1	0.7	2.8	4.0

** Aggregated sectors listed in Table 2-1, column IV.*

Source: Authors' model results and calculations.

4.5.4 WAGES AND RENTAL RATES

As in the case of TPP, the changes in output reviewed in the prior section will cause shifts in labor between sectors as a result of the FTAAP. Although the results are similar to that in the TPP, workers generally shift towards manufactures, some notable differences are present. First, managers and professionals are more evenly shifted from non-manufacturing sectors into manufactures, in contrast to the TPP, where the services sectors provided the greatest share by a large margin. Second, in the case of low skilled workers, agricultural sectors continue to contribute the largest share of low skilled workers. However, services sectors do not decline, in contrast to the TPP. This is due to the fact that the gains in manufacturing output are much lower in the FTAAP than they were in the TPP and hence competition for factors is less intense. The manufacturing sectors can therefore obtain more of the factors they need from the declining agricultural sectors, rather than from the expanding services sector that are also in need of more factors.

Table 4-19 Vietnam's change in labor demand due to FTAAP, by major sector, 2035 (cumulative percent change relative to TPP)

	Managers and Professionals		Technicians and Associate Professionals		Clerks		Sales and service workers		Low skilled	
Sector*	Share workers in sector (2020)*	Cum difference 2035	Share workers in sector (2020)*	Cum difference 2035	Share workers in sector (2020)*	Cum difference 2035	Share workers in sector (2020)*	Cum difference 2035	Share workers in sector (2020)*	Cum difference 2035
Agriculture	6.7	-1.6	1.6	-1.6	3.7	-1.2	6.4	-1.3	51.0	-0.8
Oil, gas, and minerals	7.5	-1.1	1.2	-1.1	5.5	-1.0	6.2	-1.1	10.8	-1.4
Manufactures	18.7	4.6	4.3	4.6	8.4	4.9	14.3	4.6	20.9	3.9
Services	67.1	-0.9	92.9	-2.2	82.4	-0.9	73.1	-0.8	17.3	1.3

** Aggregated sectors are listed in Table 2-1, column III. Agriculture includes processed food.*

Source: Authors' model results and calculations.

Figure 4-13 illustrates the cumulative change in wage and rental rates with the FTAAP, as measured against the TPP. The first item to note is the much stronger growth in land rents in contrast to the TPP. Land rents grow to over seven percent above the rates projected under the TPP. The big boost in rice exports figures significantly here. Next, capital rents, like in the TPP increase significantly in the early period of liberalization (2025) and then decline as capital stocks are augmented. As under the TPP, all labor occupations experience wage growth. However, in contrast to the TPP scenario, wages do not begin to contract under the FTAAP, but that may be a result of the shorter time horizon projected under the FTAAP, 15 years in contrast to 20 years for the TPP.

Figure 4-13: Vietnam's change in real wages, rental rates for capital, land and natural resources due to FTAAP, 2025-2035 (cumulative percent change relative to TPP)*

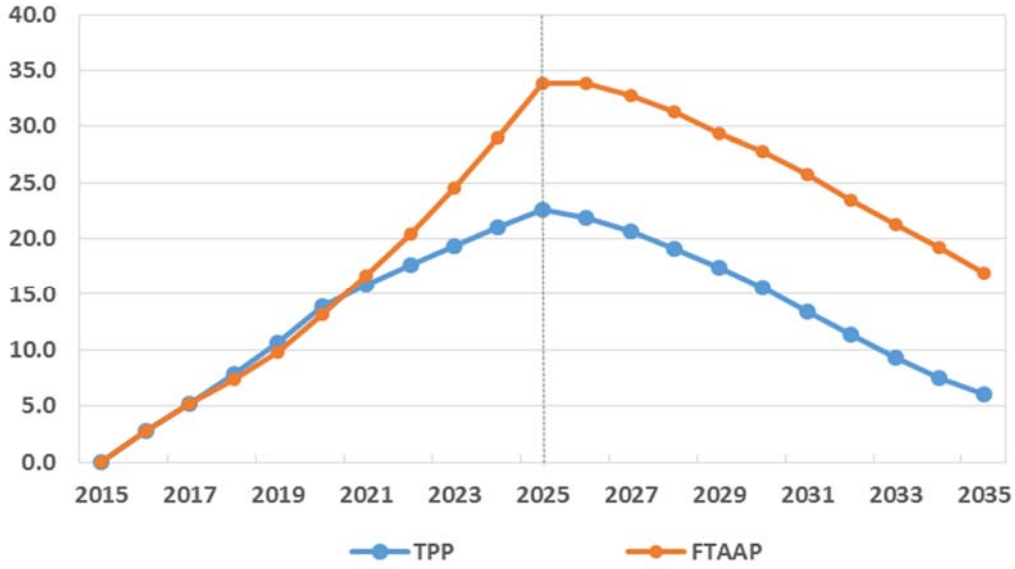
Source: Authors' model results and calculations.

4.5.5 INVESTMENT

Investment in Vietnam increases as a result of the FTAAP. Figure 4-14 shows the cumulative percent change in Vietnam's investment over the period 2015 -2035. In this case, we choose to show years earlier then 2025, if only to illustrate the very small impact on Vietnam's investment of the China-Korea-Japan FTA in the period 2018-2020. Investment under the FTAAP falls very slightly as a result of the China-Korea-Japan FTA. As the full FTAAP is put into force, investment in the FTAAP region recovers and grows significantly until 2025, when it levels off then declines as in the case of the TPP, albeit, at a higher level than TPP. Unlike the TPP, which shows investment growing for 10 years starting in 2016 to 2025, the FTAAP increases investment for six years, from 2020-2025. This underscores the diminished importance of tariffs

in the FTAAP scenario, which were much more significant in the TPP scenario, since NTMs are phased out over five years in our scenario.

Figure 4-14: Vietnam's change in real investment due to TPP and FTAAP, 2015-2035 (cumulative percent change relative to mid-growth baseline)



Source: Authors' model results and calculations.

5 State Owned Enterprise (SOEs) reform

During the 1990s and early 2000 period, Vietnam equitized,[31] restructured or otherwise divested itself of thousands of State Owned Enterprises (SOEs) (VDR, 2012). In the latter part of the 2000s, eager to create analogs of Korean and Japanese conglomerates, the Vietnamese government embarked on a plan to consolidate many of the remaining SOEs into state owned General Corporations and State Economic Groups (SEGs). Initially the General Corporations and SEGs did well, but weaknesses in the system soon became apparent with the failure of several high profile business. During the 2006-2009 period, state agencies were estimated to comprise 36.1 percent of Vietnam's GDP (Dinh et al. 2010) which is a modest decline from the 1996-2000 (39.5 percent) and the 2001-2005 periods (38.7 percent) (VDR, 2012).

There has been recognition within the Vietnamese government that further reform of the SOE system is required. It has become clear that SOEs are claiming a disproportionate share of national investment in land, property and physical assets, with a less than proportionate increase in enterprise performance. Over the 2006-2009 period, SOEs comprised approximately ten percent of Vietnam's total investment (Dinh et al. 2010). In addition, Dinh et al. (2010) calculate the growth of value added in the state sector as a proportion of GDP at 4.14 percent, which was below the average GDP growth rate of approximately seven percent for that period. The World Bank echoed this conclusion in the VDR (2012), highlighting that SOEs have made up a disproportionate level of investment in recent years and have not performed well in their estimation. The VDR (2012) notes that in 2009, the average ratio of turnover (sales) to assets for SOEs was 1.1, compared to 21.0 for the entire economy. The VDR (2012) concludes that restructuring the SOEs will be important for Vietnam's future growth.

The National Assembly indicated that restructuring the SOEs will be a top priority of the government in the Socio-Economic Development Plan spanning 2011-2015 (VDR, 2012). SOE reform continues to be an important part of the Vietnamese restructuring agenda.

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31 We recognize that the term equitize refers to specific programs and forms of restructuring in Vietnam.

5.1 Modeling SOE Reform

As the Vietnamese government continues to consider restructuring of the SOE sector, the question arises: how could Vietnamese growth and development be effected by these changes? While it is impossible to say exactly what reforms will take place in the coming years, the VDR (2012) suggests that SOE reform might include several key elements aimed at increasing the efficiency of SOEs:

— replacing planning powers with substantial autonomy;

— giving enterprises the authority to set prices and determine investment;

— giving managers the right to lay off excess workers within prescribed guidelines;

— allowing enterprises to sell excesses production at market prices; and

— setting hard budget constraints.

The VDR (2012) suggest that not all SOEs will be candidates for reform, however, the following groups of SOEs are likely to be identified:

— those that need to be immediately reformed with the government stake reduced to under 51 percent;

— those SOEs which require management restructuring before being later sold; and

— those that will always remain one hundred percent under state ownership control.

Using these guidelines, a nuanced scenario of SOE reform is defined and the potential impact of those reforms on Vietnamese income and growth is examined. Specifically, we employ the Enterprise Survey data set provided by the World Bank; this has sector level information on SOE sales, assets, and employment for the period 2008-2012.[32] We focus analysis of the Enterprise Survey data on the year 2012.

Initial analysis of the Enterprise Survey data confirms previous analysis by Dinh et al. (2010) that while the SOE sector is estimated to generate 30 percent of sales in 2012, it possesses nearly 37 percent of Vietnamese business assets[33]. Table 5-1 illustrates selected data contained in the Enterprise Survey. According to Table 5-1 there is considerable variation in the sales to asset ratios of SOEs across sectors. Notably, some SOE sectors report a higher proportion of sales than their share in sector assets. For example, in agriculture, SOEs comprise 80 percent of total

32 This database was provided on January 22, 2015 from Viet Tuah Dinh: "Vietnamese Enterprise Survey (2008-2013)".

33 Figures in the Enterprise Survey database differ somewhat in the total amounts, where the percent of SOE assets are even higher, at 39 percent of total assets. The percent of SOE to total sales is proportionally the same as reported here.

sales, while they only control 74 percent of assets[34]. While in sectors such as textiles, apparel and footwear the SOE sector appears to be performing as well as the non-SOE sector, as measured by sales to assets. Appendix Table AIV- 1 provides further details of the 56 Vietnamese sectors and the performance of SOEs relative to non-SOE enterprises.

The potential impact of restructuring SOEs therefore depends on which of the sectors are restructured. In our analysis, we classify enterprises in the following categories:

— Strategic SOE sectors. These sectors include extraction, health, human services, waste disposal, and national defense among others and are excluded from SOE reform.[35] (Category A);

— Highly profitable SOEs, which when compared to the non-SOE sector, have higher sales to asset ratios, the government retains these SOEs, since reform is not likely to improve their performance (Category B);

— SOEs selected for reform. These sectors are those that have lower than average sales to asset ratios and are likely to benefit from reform (Category C).

Appendix Table AIV- 1 lists each of nearly 56 Vietnamese sectors, as reported in the SOE database, for 2012 and their status as being: a) strategic; b) no reform expected; and c) selected for reform. For example, in the forestry and fishing sector, the sales to asset ratios of SOEs is on a par or better than the non-SOE sectors and therefore is not considered for reform (category B – Table AIV-1). Meanwhile, coal and oil extraction are considered strategic assets (category A) and will remain under the control of the government as a SOE. Finally, the sales to asset ratios of SOEs in the beverages, tobacco products and textile sector suggest that these sectors might benefit from restructuring and some alternative form of organization and hence they are allocated to category C (Table AIV-1).

In determining the shocks to be applied we assume that fifty percent of SOE assets in selected sectors (category C) are restructured to obtain the same sales to asset ratio as non-SOE enterprises. In addition, in recognition of the fact that the Vietnamese government is likely to take a gradualist[36] approach to SOE reforms, we implement these shocks gradually over a five year period from 2016-2020.

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34 A question to be explored in future analysis is the role of state trading companies in the wholesale and retail sectors, suggesting rents in that sector, which may be economically inefficient despite the high sales to asset ratio.

35 Specifically, we assume the government will not reform International Standard Industrial Classification (ISIC) sectors including: Group C-Mining and quarrying (including oil, gas and petroleum extraction); Group E-Electricity, gas and water distribution and supply; Group L-Public administration, defense, or compulsory social programs; Group M-Education; Group N-Health and social work; Group O-Other community, social and personal services activities, such as sewage and waste disposal.

36 The VDR (2012) notes that the Vietnamese government prefers marginal reforms over "big bang" solutions and that this gradualist approach is unlikely to change in the case of SOE reform: "Therefore, reaching consensus on the extreme position such as equitizing all SOEs will be difficult" (VDR, 2012, p 42).

Table 5-1: Vietnam State owned enterprises (SOE), sales, assets and average increase in output resulting from a fifty percent restructuring of assets out of SOE sector (billion dong and percent)

Sector*	Sales (2012)			Assets (2012)		
	Total	SOE	SOE to total	Total	SOE	SOE to total
AGRICULTURE						
Agriculture	102,342	82,251	80%	259,002	191,953	74%
Beverages and tobacco products	1,191,772	175,309	15%	703,481	117,550	17%
Fish and livestock	26,346	11,281	43%	18,808	4,925	26%
Forestry and wood products	91,225	9,005	10%	122,091	14,942	12%
PETROLEUM AND MANUFACTURE						
Oil, gas, minerals	1,101,088	698,027	63%	2,833,623	2,233,586	79%
Textiles, apparel, and leather	549,155	27,528	5%	439,487	28,243	6%
Chemicals, rubber and plastics	495,758	87,877	18%	400,761	80,979	20%
Transport and other manufactures	640,082	72,195	11%	603,183	115,598	19%
Electrical machinery and metals	1,557,697	69,242	4%	982,428	64,875	7%
SERVICES (SELECTED)						
Other services (govt and private)	1,080,705	962,436	89%	2,008,015	1,775,047	88%

** Aggregated sectors listed in Table 2-1, column IV.*

Source: Vietnam Enterprise Survey (2008-2013) provided by the World Bank Group and authors' model results and calculations. See appendix Table AIV- 1 for details.

Two factors will determine the extent to which a sector might benefit from reorganization: 1) the relative difference between the SOE and non-SOE sales to asset performance; and 2) the relative size of the SOE sales to total sector sales. The worse the SOE sales to asset performance relative to non-SOEs, and the larger the share of SOE sales in total sales, the greater will be the projected impact of reform, other things held equal.

The data in Table AIV-1 provide the basis for projecting productivity growth of SOE reform in our model. However, we note several important limitations of the SOE data provided in the Enterprise Survey (the source of the data in Table 5 1). First, the enterprise data are for 2012 and our policy takes place in 2016. Second, some of the data in the survey were missing. To account for these limitations, the enterprise data were re-weighted using the GTAP output data. Table 5 2 includes the projected productivity changes employed in the model, by sector, after weighting by the GTAP output data. Overall, we project an industry- and service-wide productivity increase of 1.7 percent by reforming fifty percent of the SOEs selected as candidates (category C).

Table 5-2: Vietnam projected sector change in productivity (2015 share in production and average change in sector productivity)

Sector*	Projected share in 2015 production	Average change in productivity
AGRICULTURE		
Rice and other grains	5.7	0.0
Vegetables, fruit, nuts other basic ag	2.9	0.0
Fish and livestock	4.6	0.0
Processed food	5.5	0.5
Forestry and wood products	3.5	0.4
PETROLEUM AND MANUFACTURES		
Oil, gas, minerals	10.0	0.7
Textiles, apparel, and leather	18.0	0.4
Chemicals	4.8	2.2
Transport and other manufactures	4.9	5.1
Electrical machinery and metals	8.4	0.5
SERVICES		
Construction, insurance, business services	10.7	2.8
Trade, transport and communications	8.8	9.5
Other services (govt and private)	12.2	0.0
Total/average	100.0	1.7

** Aggregated sectors listed in Table 2-1, column IV.*

Source: Vietnam Enterprise Survey (2008-2013) provided by the World Bank Group and authors' model results and calculations. See appendix Table AIV- 1 for details.

5.2 SOE Analysis

In the following sections we review the impacts of the SOE reform, as modeled by the increases in productivity reported in Table 5-2. A comparison of these results with those obtained relative to the low- and high-growth baselines is provided in Appendix V. As mentioned earlier, we implement the productivity increases over a five year period from 2016-2020, assuming the same annual change. Hence, all productivity shocks are concluded by the year 2020, although the benefits from the reform on investment are likely to continue beyond 2020 and we examine the impact of these reforms to 2035.

5.2.1 OVERVIEW

Overall, Vietnam's GDP and investment increase with SOE reform, benefiting the economy. Real GDP and investment increase in all years following the reform (Table 5-3). By 2035, real GDP has increased by 8.7 percent relative to the baseline (Figure 5-1). Investment increases by 8.9 percent and capital stocks increase by 10.2 percent relative to the baseline.

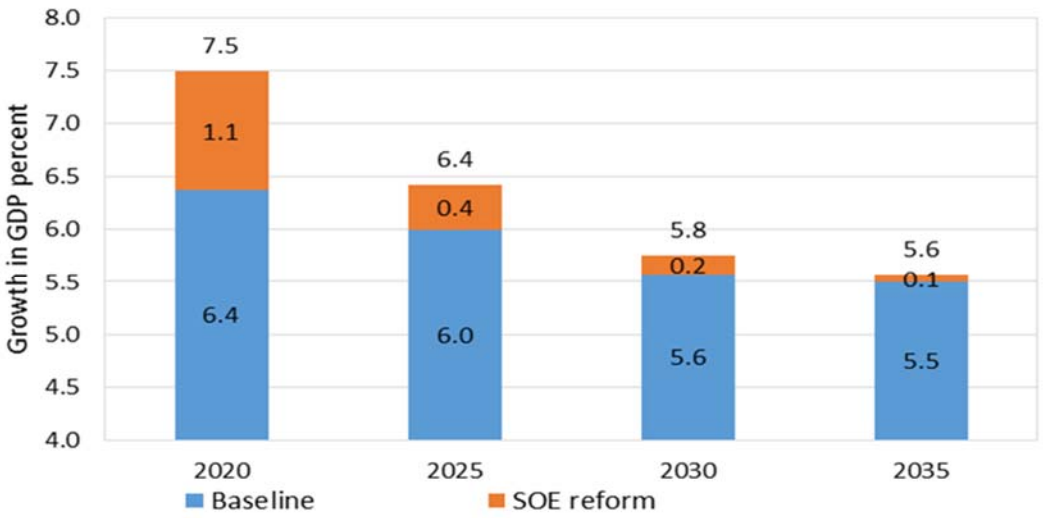
Table 5-3: Overview of SOE reform impacts on Vietnam 2020-2035 (cumulative percent change relative to mid-growth baseline—except where noted)

	2020	2025	2030	2035
Real GDP	5.3	7.5	8.4	8.7
Real exports	2.9	6.3	8.0	8.5
Real imports	4.3	6.1	6.3	5.9
Real investment	14.5	14.8	11.6	8.9
Real capital stock	3.3	8.3	10.3	10.2
Change in trade balance (millions of US$ 2007)	-5,009	-5,435	-3,968	-2,406

Source: Authors' model results and calculations.

In the short term, the trade deficit increases (2020-2025) with the policy reform, reflecting increased investment in Vietnam, then the impact begins to dampen in the long run (2030-2035). Investment growth is strongest in the period following the SOE reform (2020-2025), but diminishes in later years (2030-2035) once the reforms have been completed and investment is higher.

Figure 5-1: Vietnam change in real GDP due to Baseline and SOE reform, 2020-2035 (average annual growth*)



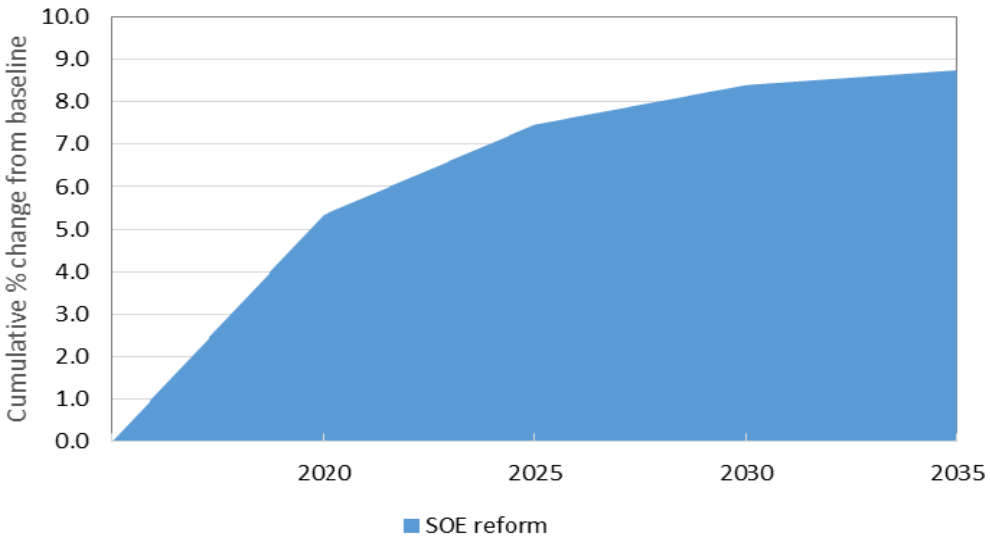
Source: Authors' model results and calculations.

**Average annual growth is calculated as the average of the prior five year period (e.g., 2020 includes the average of 2016-2020).*

Figure 5-1 depicts the average annual growth in real GDP over five year periods between 2016 and 2020. For the period 2016-2020 (marked 2020 in Figure 5-1), Vietnam's growth in real GDP increases by 1.1 percentage points over the projected baseline average annual growth in real GDP, resulting in an average annual growth rate of 7.5 percent. After the reforms are completed, their impact is reduced, with the increase in average annual growth in real GDP declining to 0.4 percentage points per annum (2020-2025). This continued growth in real GDP after the reforms are completed is due to the additional investment and capital. In the longer

term, 2030-2035, real GDP growth rates return close to the baseline growth, though the cumulative increase in real GDP remains higher than without the reform (Figure 5-2).

Figure 5-2: Vietnam's change in real GDP due to SOE reform, 2020-2025 (cumulative percent change relative to mid-growth baseline)



Source: Authors' model results and calculations.

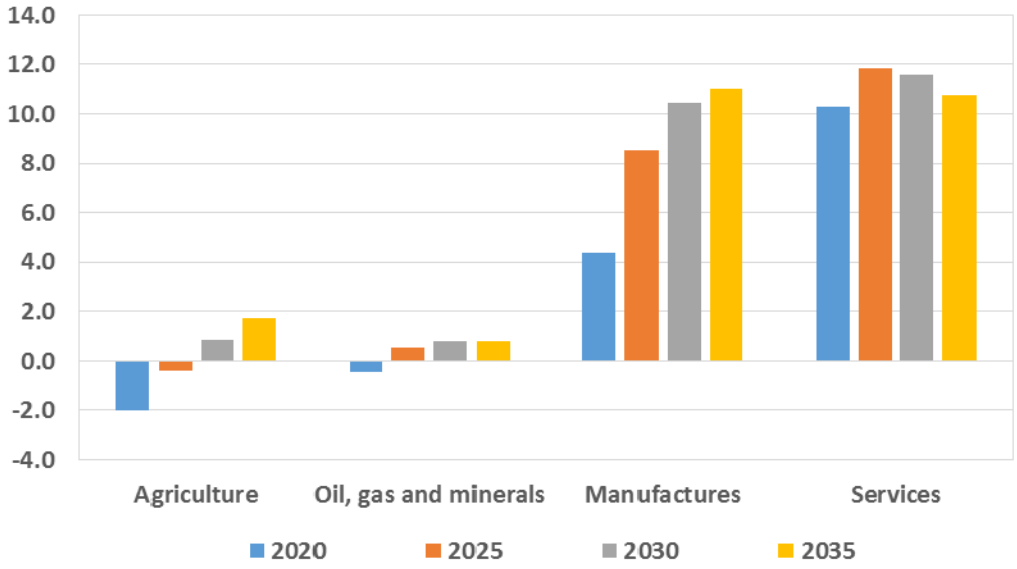
5.2.2 OUTPUT

Figure 5-3 provides an overview of cumulative changes in Vietnamese output between 2020 and 2035. The results broadly follow the changes in productivity we projected to result from SOE reform (Table 5-2), with changes in output greatest in the services and manufacturing sectors, the two sectors projected to experience the largest increases in productivity. Growth for the services sectors is projected to peak at nearly 12 percent over baseline in 2025, while manufactures growth is expected to be more than 10 percent over baseline growth by 2035 (Figure 5-3). Agriculture and oil, gas, and minerals, which are projected to have lower than average productivity increases as a result of SOE reform, are expected to see a decline in their growth rates relative to the baseline through 2020. By 2030, however, both the agriculture and oil, gas and minerals sectors are projected to experience modest growth over the baseline.

This pattern of initial declines, followed by later increases can be seen throughout the results for both output and exports. The pattern can be traced back to the size of the shocks. Table 5-2 shows that there are a couple of manufacturing and service sectors that gain significantly from the SOE reforms, while most other sectors' productivity gains are smaller or zero. The productivity shocks have the effect of reducing prices, which in turn raises demand and production or output. The larger the productivity shock, the larger the increase in demand and production of these commodities. Increased production in these manufacturing and services sectors brings about increased competition for resources (capital and labor) by these sectors. The rental price of capital and the wage rate of labor rise. Those sectors with the largest

productivity gains are better placed to compete for these factors of production, since the productivity gains lower their prices and raise demand for their product, therefore output rises. Those sectors with smaller productivity gains see the benefits of the productivity gains offset by a rise in the cost of resources and hence output falls, at least in the short run. The rise in the rental price of capital, however, has a secondary benefit as it causes the rate of return in Vietnam and hence overall investment to rise. Over time, this investment causes an accumulation of capital stocks that reduces the rental price of capital, thereby lowering the cost of production across all sectors and allowing other sectors to eventually take advantage of the productivity gains from the SOE reforms.

Figure 5-3: Vietnam's change in real output due to SOE reform, by major sector, 2020-2035 (cumulative percent change relative to mid-growth baseline)*



** Aggregated sectors are listed in Table 2-1, column III. Agriculture includes processed food.*

Source: Authors' model results and calculations.

Table 5-4 provides a detailed commodity breakdown of results contained in Figure 5-3. The commodity level detail is generally consistent with the sector level results, with the exception of fish and livestock in agriculture which increases in output even in the initial period, and electrical machinery in manufactures, which reduces output slightly in the initial period.

As was the case with the oil, gas and minerals sector, the electrical machinery and metals sector experiences only a small increase in productivity as a result of the SOE reforms (Table 5-2). Hence the increase in factor costs for labor and capital causes output to fall initially, although as capital rentals fall over time the sector recovers and is able to take advantage of its increased productivity.

The fish and livestock is slightly more complicated since this sector did not experience a productivity increase as a result of the SOE reform, yet it still experiences an increase in output in the initial period (2016-2020). In contrast to other agricultural sectors, livestock is an input into investment. As indicated in Table 5-3, investment in Vietnam grows rapidly as a result of

the SOE reform. This growth in investment increases the demand for investment goods, including livestock, giving a boost to demand for these products, even in the absence of a shock to productivity in that sector. As investment moderates, all sectors, including fish and livestock, then benefit from the decrease in the rental price of capital resulting from increased capital stocks.

Table 5-4: Vietnam's change in real output due to SOE reform, by sector, 2020-2035 (cumulative percent change relative to mid-growth baseline and share in value added)

Sector*	Baseline share in value added 2015	Cumulative percent change from baseline growth			
		2020	2025	2030	2035
AGRICULTURE					
Rice and other grains	6.1	-0.9	-0.6	-0.4	-0.2
Veg, fruit, nuts and other agriculture	6.1	-1.4	-1.0	-0.8	-0.6
Fish and livestock	7.4	0.4	0.6	0.8	1.2
Processed food	2.8	-1.8	-0.4	0.9	2.0
Forestry and wood products	4.2	-6.4	-0.8	2.5	3.6
PETROLEUM AND MANUFACTURES					
Oil, gas, minerals	15.4	-0.5	0.5	0.8	0.8
Textiles, apparel, and leather	6.9	0.0	3.2	4.7	5.2
Chemicals	2.5	7.7	12.2	14.1	14.6
Transport and other manufactures	2.5	27.8	35.3	39.1	40.9
Electrical mach. and metals	3.2	-0.3	3.9	5.5	5.5
SERVICES					
Construction, insurance, business services	11.1	14.1	16.8	16.9	17.3
Trade, transport and communications	9.0	20.0	19.9	17.6	14.5
Other services (govt and private)	22.7	0.4	2.6	3.8	3.7

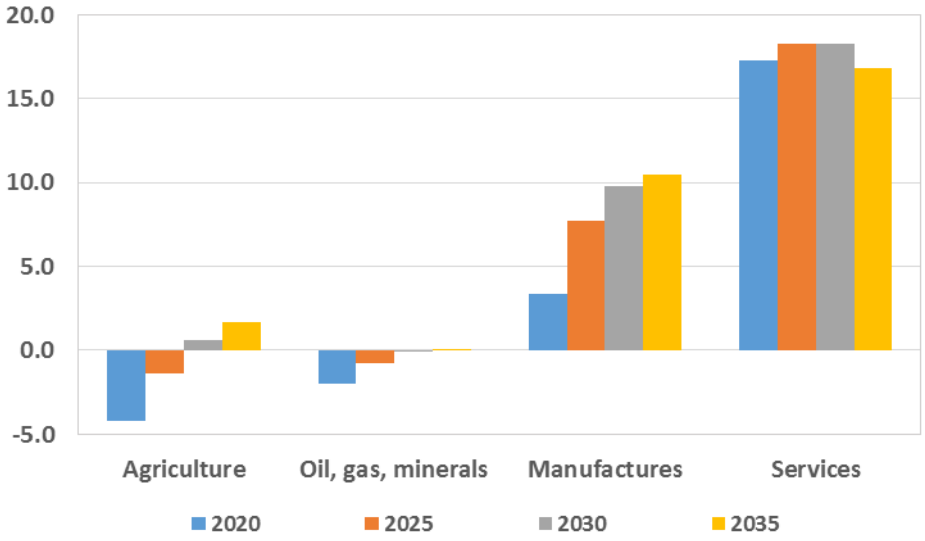
** Aggregated sectors listed in Table 2-1, column IV.*

Source: Authors' model results and calculations.

5.2.3 EXPORTS

Figure 5-4 illustrates the changes in real exports resulting from SOE reform for four broad sector classifications. Exports of both manufactures and services increase, while agriculture and oil and gas exports decrease (or remain the same) as baseline exports. Cumulatively, services exports increase by approximately 17 percent over baseline exports. Similarly, manufactured exports are projected to grow by nearly 10 percent over the baseline by 2035. In fact, exports of manufactures grow modestly up to the last year of SOE reform (2020) and then continue to grow, more than doubling the 2020 cumulative gain in exports (Figure 5-4). This again underscores the importance of productivity growth combined with capital accumulation as a means of achieving growth in the long run.

Figure 5-4: Vietnam's change in real exports due to SOE reform, by major sector, 2020-2035 (percent change from mid-growth baseline)*



** Aggregated sectors are listed in Table 2-1, column III. Agriculture includes processed food.*

Source: Authors' model results and calculations.

Table 5-5 illustrates the cumulative change in Vietnam's exports relative to the baseline during the period 2020-2035. Agricultural exports generally decline in early years, then improve in later years. The two agricultural sectors, processed food along with forestry and wood products, that experienced some productivity improvement as a result of the SOE reform, also experienced this initial decline, followed by an eventual rise in exports relative to the baseline by 2035.

Table 5-5 Vietnam's change in real exports due to SOE reform, by sector, 2020-2035 (cumulative percent change relative to mid-growth baseline)

Sector*	Share of exports 2015	Cumulative percent change from baseline			
		2020	2025	2030	2035
AGRICULTURE					
Rice and other grains	2.4	-2.8	-2.2	-1.8	-1.8
Vegetables, fruit, nuts other basic ag	3.7	-1.8	-1.5	-1.4	-1.3
Fish and livestock	0.3	-6.8	-7.6	-6.8	-3.9
Processed food	5.4	-3.4	-1.4	0.3	1.7
Forestry and wood products	6.0	-6.4	-0.8	2.4	3.5
PETROLEUM AND MANUFACTURES					
Oil, gas, minerals	16.5	-2.0	-0.7	-0.1	0.1
Textiles, apparel, and leather	32.9	-0.1	3.0	4.6	5.1
Chemicals	5.0	8.4	12.7	14.6	15.0
Transport and other manufactures	3.9	38.8	45.4	49.0	51.0
Electrical machinery and metals	16.4	-1.0	3.5	5.2	5.2
SERVICES					
Construction, insurance, business services	3.4	17.4	23.5	27.0	28.4
Trade, transport and communications	2.6	37.9	29.7	22.6	16.4
Other services (govt and private)	1.7	-11.0	-3.7	0.4	1.1
Total	100.0	2.9	6.3	8.0	8.5

** Aggregated sectors listed in Table 2-1, column IV.*

Source: Authors' model results and calculations.

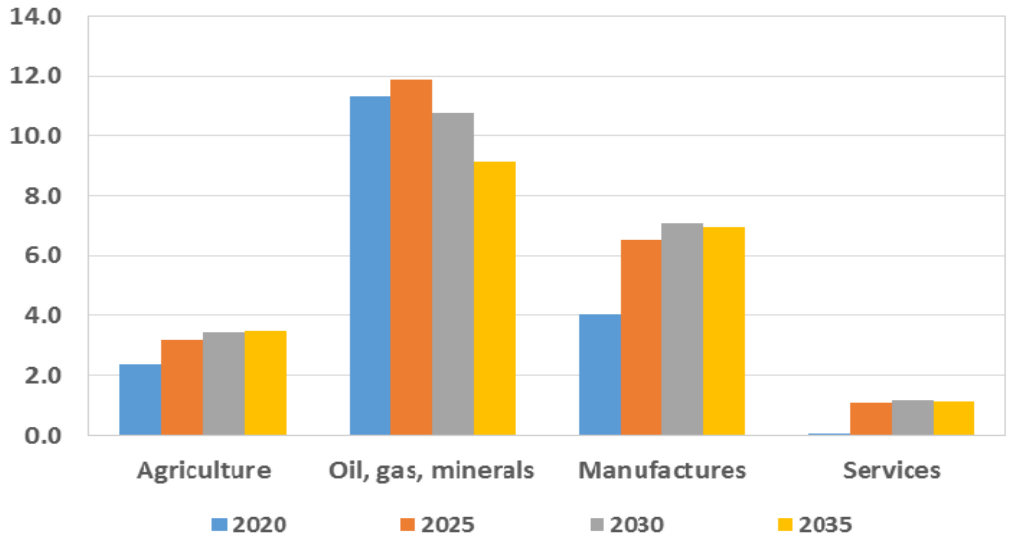
Exports of petroleum and manufactured products generally increase under the SOE reform scenario. Oil and gas exports, which are capital intensive, fall as the cost of capital increases under SOE reform, but eventually increase relative to the baseline in 2035 as capital cost moderate. The textiles, apparel and leather sector also declines initially. In this case, the textiles sector is the main beneficiary of the productivity shock, while apparel is the main export commodity. Hence the initial fall in exports is the result of the high cost of producing apparel as resources become more expensive. Electrical machinery, like textiles, experiences a small productivity improvement from SOE reform, but increased capital rental rates initially cause a reduction in exports, as these additional costs exceed the modest productivity increase due to SOE reforms. In the longer term, as capital costs attenuate, exports increase above the baseline.

5.2.4 IMPORTS

Figure 5-5 illustrates Vietnam's imports by broad sector classification. Imports of all commodities including agricultural, oil, gas, mineral, manufactured and services increase relative to the baseline.

The growth in oil, gas, and minerals imports is notable, since they are nearly twice as large as the increase in imports of the next largest category, manufactures. Although oil, gas and mineral products exhibit an increase in supply prices in the initial years, due to higher capital and labor costs, this cannot fully explain the rise in imports of these products. Instead, we have to look at the derived demand for these goods – i.e., the end products which employ them most intensively. Demand for oil, gas and minerals comes from air and other transport (27 percent of intermediate demand is for this input), construction (19 percent of intermediate demand), and other services (nearly 9 percent of intermediate demand). As discussed above, all these sectors experienced rapid growth in output under the SOE reform, and as a result will increase their demand for intermediate goods (domestic and imported), as well as resources. The rise in demand for services imports is also due to its demand as an intermediate into manufactures and other services.

Figure 5-5: Vietnam's change in real imports, by major sector, due to SOE reform, 2020-2035 (cumulative percent change relative to mid-growth baseline)*



** Aggregated sectors are listed in Table 2-1, column III. Agriculture includes processed food.*

Source: Authors' model results and calculations.

Table 5-6 illustrates that these broad results for import growth generally hold at the commodity level, except in a few cases of rice, textiles, and trade and transport services, which are all slightly negative through 2020. As mentioned above these declines are generally due to reduced intermediate demand caused by reduced production of the final commodity which uses the intermediate input or reduced input demand due to increased productivity or both.

In the case of rice and other grains, rice imports increase, following the broad trend, however imports of other grains fall as the agriculture sector experiences a decline in output and hence reduces its intermediate demand for other grains. In the case of textiles, apparel and leather products, imports of textiles fall as demand falls due to the increase productivity of the Vietnamese textile sector. This is in contrast to the situation with exports, reviewed above,

where exports of apparel dominated results. Here, imports of textiles decline due to the enhanced productivity derived from SOE reform in that sector.

Finally, trade, transport and communication services imports decline as a result of the SOE reform since this domestic sector grows rapidly in Vietnam as a result of the SOE reform. Table 5-2 indicates that this sector gains the most in terms of productivity as a result of SOE reform, more than double that of any other sector in the Vietnamese economy. These strong productivity impacts overwhelm any derived demand (reduced output of the final product), as all sectors substitute towards these domestic services.

Table 5-6: Vietnam's change in real imports due to SOE reform, by sector, 2020-2035 (cumulative percent change relative to mid-growth baseline)

Sector*	Share of imports 2015	Cumulative percent change from baseline			
		2020	2025	2030	2035
AGRICULTURE					
Rice and other grains	0.6	-0.5	0.2	1	1.7
Vegetables, fruit, nuts other basic ag	1.8	1.2	3	3.9	4.4
Fish and livestock	0.5	5.3	5.9	5.7	5.1
Processed food	5.6	2.2	2.3	2.4	2.4
Forestry and wood products	1.8	3.8	5	5.1	4.8
PETROLEUM AND MANUFACTURES					
Oil, gas, minerals	12.8	11.3	11.9	10.8	9.1
Textiles, apparel, and leather	14.9	-0.4	2.3	3.7	4.1
Chemicals	13.5	2	4.8	6	6.4
Transport and other manufactures	8	5.5	8.3	9	9.1
Electrical machinery and metals	29.7	6.9	8.9	8.7	7.9
SERVICES					
Construction, insurance, business services	5.3	2.3	3.7	3.8	3.5
Trade, transport and communications	3.9	-5.7	-4.2	-3.7	-3.4
Other services (govt and private)	1.6	7.3	5.9	5	4.9
Total	100	4.3	6.1	6.3	5.9

** Aggregated sectors listed in Table 2-1, column IV.*

Source: Authors' model results and calculations.

5.2.5 WAGES, EMPLOYMENT AND RENTAL RATES

As discussed above, the increase in the manufactures and services sectors increases demand for labor. The manufacturing sector increases its demand for all labor types, although the increase in low skilled labor is largest. Demand for all occupations by the agriculture, and oil, gas and minerals sectors declines as labor moves to the growing manufacturing and services sectors. The demand for labor in services is more varied. The demand for managers and professionals increases three percent over the baseline, while the demand for unskilled labor deceases

slightly, changing by -0.6 percent as the increased manufacturing sectors' demand causes them to move away from services.

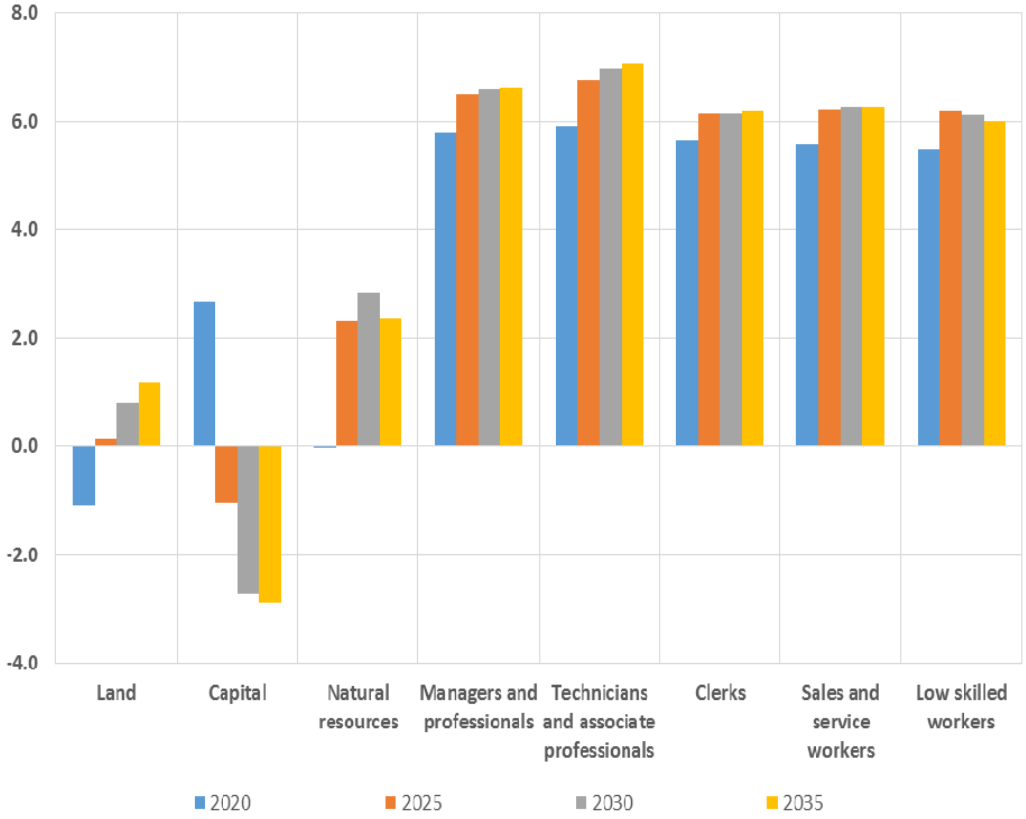
Table 5-7: Vietnams change in labor demand due to SOE reform, by major sector, 2035 (cumulative percent change relative to mid-growth baseline)

	Managers and professionals		Technicians and associate professionals		Clerks		Sales and service workers		Low skilled	
Sector*	Share workers in sector (2015)	Cum difference 2035	Share workers in sector (2015)	Cum difference 2035	Share workers in sector (2015)	Cum difference 2035	Share workers in sector (2015)	Cum difference 2035	Share workers in sector (2015)	Cum difference 2035
Agriculture	7.2	-2.8	1.7	-3.2	4.0	-2.3	7.0	-2.3	55.3	-1.3
Oil, gas, and minerals	7.2	-1.9	1.1	-2.1	5.2	-1.8	5.9	-1.9	9.8	-1.7
Manufactures	18.5	5.0	4.2	4.4	8.4	5.5	14.3	5.5	19.8	5.7
Services	67.1	3.0	93.0	-2.0	82.5	0.6	72.9	0.7	15.1	-0.6

** Aggregated sectors listed in Table 2-1, column III.*

Source: Authors' model results and calculations.

Figure 5-6: Vietnam's change in real wages and rental rates of capital, land and natural resources due to SOE reform, 2020-2035 (cumulative percent change relative to mid-growth baseline)*



** Endowments listed in Table AI- 3.*

Source: Authors' model results and calculations.

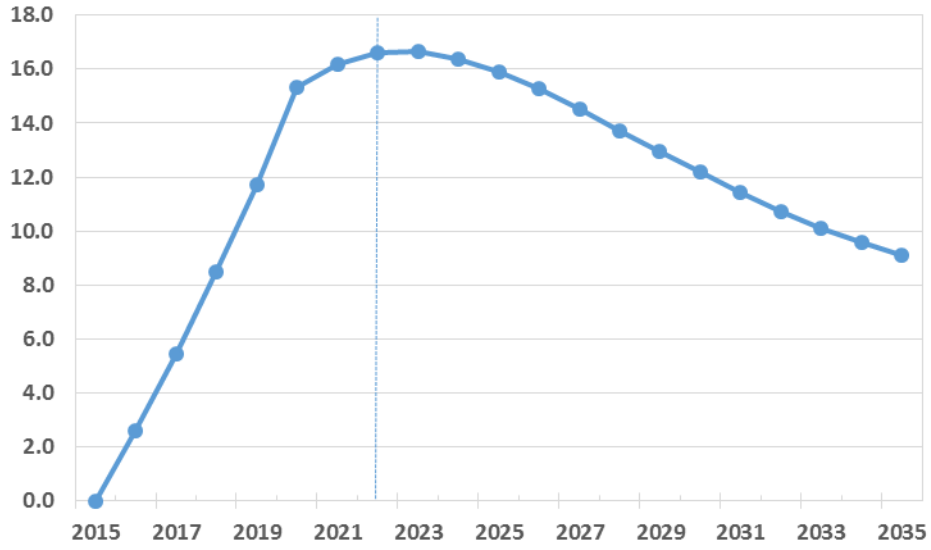
Figure 5-6 provides an overview of factor costs. In general, real wages for workers increase by between 5.5 percent for low skilled workers in 2020, to 7.1 percent for technicians and professionals in 2035. By 2035, real wages for all labor categories increases to between six and seven percent from baseline. The real rental rate on land declines by one percent in 2020 as agricultural production falls, but then recovers with agriculture to about one percent above baseline by 2035. The real rental rate on capital exhibits the most variability over time. The rental rate on capital initially increases by 2.7 percent in 2020. However, as investment increases and capital stocks grow, the real rental rate on capital declines to less than zero in 2025 and falls to -2.9 percent in 2035, relative to the baseline.

5.2.6 INVESTMENT

The reform of the SOE sector leads to increasing real returns to capital in Vietnam in the short run (Figure 5-6), as manufacturing and services increase their demand. Investment responds to the increased rate of return caused by the higher rental rate on capital. Investment increases to just over 16 percent over baseline investment by 2022

and then begins to decline as the real rental rate on capital declines. The increase in investment, like other sectors, results in a derived demand for intermediate inputs, such as livestock, construction services, and transport equipment.

Figure 5-7: Vietnam's change in real investment due to SOE reform, 2015-2035 (cumulative percent change relative to mid-growth baseline)



Source: Authors' model results and calculations.

6 Conclusions

Despite a period of strong growth in Vietnam prior to the 2008-2009 financial crisis, recent IMF (2014) forecasts reveal lower investment and workforce growth is expected in the future. Vietnam's future growth will increasingly depend on productivity growth, and hence on the ability of government policies to raise investment and productivity. In this paper we provide a range of estimates of Vietnam's economy to 2035 in light of global forecasts of real GDP, investment, labor force and trade, as well as the implementation of the Trans-Pacific Partnership, the Free Trade Areas of Asia and the Pacific and government policies aimed at reforming state owned enterprises.

External forecasts show that it is the low-middle income economies, including Vietnam, and China that will largely drive global growth between now and 2035. While still important to global growth, China's growth is expected to remain below its recent historical highs, with investment growth playing a decreasing role in its growth. The high income economies, on the other hand, continue to see their share of global GDP decline, highlighting the importance of the low-middle income economies in global growth. Despite declining population growth, forecasts obtained from the World Bank suggest that Vietnam's growth will remain robust due to continued investment and technological change. Over time however, we find that technological change will need to increase in order to maintain these growth rates. We find that some of this additional productivity will originate from the high growth in education, which will cause the supply of labor to skilled occupations to increase.

With high growth, value-added and employment are expected to move out of agriculture towards services, with the share of services in Vietnam's value added rising from 45 to 57 percent. Likewise, exports are expected to shift away from primary agricultural and extractive products towards heavy manufactures and services. As the main drivers of global growth, China and the other low-middle income economies also become important sources and destinations for Vietnam's international trade. These effects are accentuated as global growth rises in the high-growth scenario, and dampened in the low growth scenario.

The TPP, FTAAP and state-owned enterprise reforms are also expected to be key drivers of increased investment, productivity and hence growth in Vietnam. TPP projections suggest that this regional trade agreement could increase real GDP in Vietnam by over eight percent by 2030. Investment rises by over 20 percent as a result of the TPP, providing a substantial increase in capital stocks and contributing significantly to this projected increase

in long term growth. The principal source of this growth is projected to be tariff reductions in the TPP region—textiles and apparel in particular, where US tariffs remain high at over 17 percent ad valorem. Reductions in goods and services NTMs also promise to contribute significantly to Vietnam's growth.

The FTAAP is also projected to increase real GDP by 14 percent, when combined with the TPP, with growth in investment projected to add a cumulative 30 percent to baseline investment growth by 2025 (when combined with the TPP). In contrast to the TPP, we find that it is the further liberalization of NTMs, not the reduction of tariffs that contribute most significantly to Vietnam's gains from an FTAAP. Tariff benefits from the FTAAP are somewhat elusive and product specific, with loses in tariff preferences in the existing TPP market roughly canceling any gains in the new FTAAP markets.

Finally, SOE reforms directly impact the productivity of a few key sectors where reforms were deemed to be probable. We assume that only 50 percent of SOE firms within these key sectors are reformed gradually over a 5-year period, starting in 2016. Under these reforms cumulative baseline real GDP is projected to increase by nearly nine percent in 2035. The SOE reforms are also expected to raise investment by a cumulative 16 percent at its peak, relative to the baseline in 2022.

Appendix I GTAP Database Aggregation

Table AI- 1: Sectoral aggregation

Aggregated sector	Mapping to GTAP sectors
Rice	Paddy rice and processed rice
Fishing	Fishing
Other grains	Wheat; cereal grains not elsewhere classified (nec); and oil seeds
Other agriculture	Vegetables, fruit and nuts; sugar cane and sugar beet; plant-based fibers; crops nec; and fishing
Livestock	Bovine cattle and sheep; other animal products nec; raw milk; wool, silk-worm cocoons
Forestry and wood products	Forestry and wood products
Extraction	Coal; oil; gas; and minerals nec; petroleum and coal products; and mineral products nec
Meat products	Bovine cattle and sheep products; and other meat products
Food and beverages	Vegetable oils and fats; dairy products; sugar; food products nec; and beverages and tobacco products
Textiles	Textiles
Wearing apparel and leather products	Wearing apparel and leather products
Chemicals	Chemical, rubber & plastic
Metals	Ferrous metals; metals nec; and metal products
Electronic equipment	Electronic equipment
Machinery	Machinery and equipment
Transport equipment	Motor vehicles and parts; and transport equipment nec
Other manufactures	Paper products and publishing; and manufactures nec
Other services	Electricity; gas manufacture and distribution; water; recreational and other services; and ownership of dwellings
Construction	Construction
Finance and insurance	Insurance; finance; and other business services
Transport	Transport nec; water transport; and air transport;
Trade and Communications	Trade; and communication
Government Services	Public administration and defense

Source: Authors' aggregation of the GTAP database

Table AI- 2: Regional aggregation

Aggregated regions	Mapping to GTAP Regions	Allocation to World Bank categories
Vietnam	Vietnam	Low-middle income economies
Australia	Australia	High income economies
New Zealand	New Zealand	High income economies
China	China	Upper-middle incomes economies
Hong Kong	Hong Kong	High income economies
Japan	Japan	High income economies
Korea	Korea	High income economies
Taiwan	Taiwan	High income economies
Indonesia	Indonesia	Low-middle income economies
Malaysia	Malaysia	Upper-middle incomes economies
Philippines	Philippines	Low-middle income economies
Singapore	Singapore	High income economies
Thailand	Thailand	Upper-middle incomes economies
India	India	Low-middle income economies
Canada	Canada	High income economies
USA	USA	High income economies
Mexico	Mexico	Upper-middle incomes economies
Chile	Chile	High income economies
Peru	Peru	Upper-middle incomes economies
Russia	Russia	High income economies
Europe	Europe: 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, Switzerland, Norway, Rest of EFTA	High income economies
Rest of ASEAN	Cambodia, Lao People's Democratic Republic, Rest of Southeast Asia	Lower income economies
Rest High Income Economies	Rest of North America, Uruguay, Croatia, Rest of Europe, Bharain, Israel, Kuwait, Oman, Qatar, Saudi Arabia, United Arab Emirates, Rest of the World	High income economies
Rest low-middle income economies	Rest of Oceania, Mongolia, Pakistan, Sri Lanka, Bolivia, Paraguay, Rest of South America, Guatemala, Honduras, Nicaragua, El Salvador, Ukraine, Rest of Eastern Europe, Kyrgyztan, Rest of Former Soviet Union, Armenia, Georgia, Rest of Western Asia, Egypt, Morocco, Cameroon, Cote d'Ivoire, Ghana, Nigeria, Senegal, Zambia, Rest of Eastern Africa, Rest of South African Customs	Low-middle income economies
Rest upper-middle incomes economies	Argentina, Brazil, Colombia, Ecuador, Venezuela, Costa Rica, Panama, Rest of Central America, Caribbean, Albania, Bulgaria, Belarus, Romania, Kazakhstan, Azerbaijan, Iran Islamic Republic of, Turkey, Tunisia, Rest of North Africa, Mauritius, Botswana, Namibia, South Africa	Upper-middle incomes economies
Rest lower income economies	Rest of East Asia, Bangladesh, Nepal, Rest of South Asia, Benin, Burkina Faso, Guinea, Togo, Rest of Western Africa, Central Africa, South Central Africa, Ethiopia, Kenya, Madagascar, Malawi, Mozambique, Rwanda, Tanzania, Uganda, Zimbabwe	Lower income economies

Source: Authors' aggregation of the GTAP database

Table AI- 3: GTAP endowments

Abbreviated Name used in GTAP	Short name	Description	ISCO-88 Major Group*	ILO ISCO Skill levels**	Education levels attached to those skill levels
Capital	Capital	Capital equipment and buildings	n.a.	n.a.	n.a.
NatRes	Natural resources	Natural resources	n.a.	n.a.	n.a.
Land	Land	Agricultural land	n.a.	n.a.	n.a.
off_mgr_pros	Mangers	Legislators, senior officials and managers (Major Groups 1), and professionals (Major Group 2)	1,2	3 and 4	Tertiary
tech_aspros	Technicians	Technicians and associate professionals	3	3	Tertiary
Clerks	Clerks	Clerks	4	2	Secondary
service_shop	Service/shop workers	Service workers and shop and market sales workers	5	2	Secondary
ag_othlowsk	Agricultural and unskilled	Skilled agricultural and fishery workers (Major Group 6), craft and related trade workers (Major Group 7), plant and machine operators and assemblers (Major Group 8), and elementary occupations (Major Group 9)	6,7,8,9	2 and 1	Primary/none and secondary

** ISCO-88 are the ILO labor classifications contained in each of the new GTAP labor categories*

*** These are the skilled levels corresponding to the ILO categories that indicate education levels*

Source: Walmsley and Carrico (2013) and International Labor Organization (2012)

Appendix II Baseline Background and Detail

The standard features of the GDyn model are well-documented (Ianchivochina and McDougall, 2012). However, we incorporate a number of additional features into the baseline for this study, which we detail in this appendix.

Real GDP and Technical Change

Real GDP is usually endogenously determined in the model, however if we have forecasts of real GDP we can use these, along with forecasts of labor and capital (or investment) growth, to determine the level of technological change that must have occurred to achieve the GDP increases. This level of technological change is region-specific, but we apply it differentially across factors and sectors through the use of a factor- and sector-specific multiplicative parameter. These parameters are based on differential factor productivities across sectors obtained from OECD data, and supplemented with World Bank data on productivity for agriculture. The productivity differentials apply to all factors, although for capital they are only applied only to new capital added during the period; and the rate of productivity applied to natural resources and land is significantly reduced.

For all countries with the exception of China and Vietnam, real GDP forecasts are targeted prior to 2019. Post-2019, the endogenously determined level of productivity obtained from the model in 2019 is applied through to 2035. While the technological change varies greatly between 2007 and 2015, primarily due to the financial crisis, by 2019 the productivity growth rates have settled to the more constant rates that are used post 2019.

In the case of China, we track GDP growth rates obtained from the DRCSC (2014). The forecast growth rates for China are applied to 2030, after which the implied technological change from 2030 is extrapolated to 2035. For Vietnam we track growth rates from the World Bank using forecasts to 2035. The values in Table AII- 1 for China and Vietnam detail the resulting average region-specific technological change required to match those GDP forecasts.

Table AII- 1: Average annual TFP growth (percent)

Regions*	2008-2014	2015-2020	2021-2025	2026-2030	2031-2035
Vietnam	0.6	3.1	3.4	3.6	4.5
China	2.3	3.2	4.0	4.1	4.1
High Income Economies	-0.6	0.9	0.8	0.8	0.8
Upper-middle incomes economies	0.0	1.0	1.1	1.1	1.1
Low-middle income economies	1.0	2.1	2.2	2.2	2.1
Lower income economies	1.7	2.0	1.8	1.8	1.8

** Aggregated regions are listed in Table 2-2, column II.*

Source: Authors' model results and calculations.

CAPITAL AND INVESTMENT GROWTH

Growth in capital is the result of the accumulation of investment to existing capital stocks, less depreciation. The annual depreciation rate used in this model is assumed to be 4% of the existing capital stock. Growth in capital is therefore driven primarily by the level and growth in investment. Between 2007 and 2019 the growth in investment modeled targets forecasts provided by the IMF (2014). In the case of China and Vietnam, we use forecasts of investment growth to 2030 or 2035, from the DRCSC (2014) for China and from the World Bank for Vietnam.

Investment in the Dynamic GTAP model, is determined by three mechanisms: 1) the elimination of errors in expectations; 2) changes in the rates of return due to changes in the baseline; and 3) the gradual equalization of rates of return across countries. Errors in expectations are generally the result of discrepancies between actual investment in the underlying data and the application of investment theory, whereby high rates of return drive high rates of investment. The path of a country's rate of return and hence investment is therefore determined by the gradual elimination of these the errors in expectations and the removal of differences in rates of return between countries.

When investment forecasts are imposed in the baseline, rates of return may deviate further from the path of being equalized. There are two alternative ways of dealing with this deviation – by attributing the difference to a change in the risk premium; or by attributing the differences to errors in expectations. The choice between the two methods depends on beliefs about why investment forecasts differ from the model's predictions and preferences for what happens to investment when investment forecasts are no longer targeted. If you choose to assume that all of the difference is caused by errors in expectations made by investors, then these errors will need to be eliminated once you stop targeting investment. On the other hand if you assume that the differences are caused by changes in the risk premium required by investors, then these differences are permanent and will not affect investment in later periods. In this baseline the risk premium method was adopted. This choice of the risk premium method reflects our view that risk premiums fall as countries develop, causing investment to rise by

more than is justified by current rates of return. It also reflects our belief that the rise in investment is permanent and will not be reversed at a later stage, as would happen if investors realize they have made a mistake under the errors in expectation approach.

After 2019, we assume that these risk premiums continue to change in the same direction as they had prior to 2019, although at a decreasing rate. The exceptions are China and Vietnam. For China, we track investment expenditure shares of GDP provided by the DRCSC (2014) to 2030 (Table AII- 2), while for Vietnam we assume that the investment in real GDP follows the path set out in World Bank projections to 2035 (Table 3-3).

Table AII- 2: Decomposition of nominal GDP for China by expenditure (percent share)

	2007	2014	2020	2025	2030	2035
Private consumption	37.5	36.6	39.1	43.8	46.1	46.7
Investment	40.7	47.2	44.0	38.5	35.7	32.9
Government consumption	14.1	13.4	14.3	15.1	15.5	15.5
Exports	36.1	34.2	45.7	57.9	69.7	83.7
Imports	-28.3	-31.4	-43.1	-55.3	-67.0	-78.8

Source: DRCSC (2014) and authors' model results and calculations.

PRIVATE AND GOVERNMENT EXPENDITURE, AND SAVINGS

With the exception of China and Vietnam, IMF WEO forecasts for gross national savings are implemented as changes to the savings rate. After 2019, we use the pre-2019 behavior of the savings rates to guide us in determining the behavior of savings rates post-2019. In general, if rates were trending up or down before 2019 we assume that they continue to do so. In most cases however, we find that savings tends not to rise or fall consistently as a share of income over time. Government expenditure forecasts are also tracked between 2007 and 2019. In all cases these rates tend to be constant share of income and hence after 2019 we return to the Cobb-Douglas specification of government spending.

In China the savings rate is determined as a residual after allocating income across private expenditure and government consumption. Between 2007 and 2014, Vietnam savings is also determined as a residual. After 2014, however, Vietnam's gross national savings is assumed to grow at the rate provided by the World Bank.

LABOR, PRODUCTIVITY AND UNEMPLOYMENT

The GTAP v8.1L database has 5 labor categories based on occupation (Table AI- 3). In order to develop a baseline scenario it is important to include forecasts of the supply of labor. Forecasts of labor supply are usually developed for total labor (ILO, UN) or sometimes for labor by education level (Fouré te al., 2012). In the case of labor by occupation, forecasts are usually for labor demand, not supply. In this baseline we use forecasts of labor supply by education to determine the supply of labor by occupation. Table AII- 3 contains the education forecasts used for the entire baseline period, 2007 to 2035.

Table AII- 3: Average annual growth in labor by education (average annual percent change)*

	2008-2014	2014-2020	2020-2025	2025-2030	2030-2035
VIETNAM					
Tertiary	6.79	3.71	3.23	3.49	3.22
Secondary	4.62	2.77	2.36	2.25	1.98
Primary/no education	0.46	-0.34	-1.03	-1.46	-1.89
CHINA					
Tertiary	4.62	2.52	2.28	2.28	2.34
Secondary	1.95	0.83	0.49	0.15	-0.01
No education	-1.78	-2.81	-3.7	-3.32	-3.28
HIGH INCOME ECONOMIES					
Tertiary	1.76	1.4	1.27	1.31	1.41
Secondary	0.87	0.36	0.16	0.07	0.07
No education	-2.63	-3.31	-3.29	-3.37	-3.08
UPPER-MIDDLE INCOMES ECONOMIES					
Tertiary	3.92	3.71	3.46	3.31	3.19
Secondary	2.75	2.14	1.8	1.58	1.34
No education	-0.46	-0.73	-1.05	-1.42	-1.59
LOW-MIDDLE INCOME ECONOMIES					
Tertiary	4.97	4.56	4.34	4.18	4.01
Secondary	3.78	3.27	2.96	2.75	2.49
No education	0.74	0.45	0.18	-0.11	-0.39
LOWER INCOME ECONOMIES					
Tertiary	5.22	5.21	5.13	4.91	4.71
Secondary	4.61	4.37	4.04	3.82	3.61
No education	1.77	1.8	1.65	1.48	1.27

** Aggregated regions are listed in Table 2-2, column II and education categories listed in Table AI- 3.*

Source: Authors' model results and calculations.

In earlier versions of the GTAP database, labor was divided into just two categories: skilled and unskilled. With these two categories of labor, the distinction between occupation and education was less important and forecasts by education level could be used directly. However, the five new GTAP labor categories that we incorporate into the current modeling are occupation-based, with multiple occupations being linked to education levels. The ILO mapping between the 5 occupation levels in the GTAP database we use, along with three broad education levels, is provided in Table AI- 3.

As Table AI- 3 shows, workers of particular education levels can be employed in more than one occupational group, hence the supply of a particular occupation is not necessarily fixed. For instance workers with a secondary education can be employed as either clerks or service and shop workers according to Table AI- 3.

The simple mapping shown in Table AI- 3 conceals, what is in reality, a much more complex relationship between education and occupation. In reality the education levels of these 5 different occupations differ considerably across countries, depending on the level of development (or focus on education). For instance in the USA, where secondary education is universal, all occupations tend to have higher average education levels than specified in Table AI- 3; for example, low skilled workers usually have secondary education, and clerks and sales workers often have tertiary degrees. In developing countries, on the other hand, the average education level of each occupation is generally lower than that specified in Table AI- 3. Given data on the number of workers by education and the number of workers by occupation in developing countries, it is simply not possible that all managers and technicians/associate professionals have a tertiary education, since there are more managers than workers with a tertiary education. Based on education data from Fouré te al. (2012); data on occupation from the ILO and processed by Walmsley and Carrico (2013); and the mapping provided in Table AI- 3, a bilateral matrix of workers by education and occupation for each country was constructed. The top panel of Table AII- 4 illustrates the resulting bilateral matrix for Vietnamese workers in 2007. Table AII- 4 shows that given what we know about the total number of tertiary workers and the total number of workers by occupation in Vietnam, less than 50 percent of managers and technicians must have a tertiary education; and at least 15 percent of low skilled workers must have at least a secondary education.

Table AII- 4: Number of workers in Vietnam by education and occupation (millions)*

	Office managers and professionals	Technicians and associate professionals	Clerks	Service and shop workers	Low skilled workers
		2007			
Tertiary education	0.9	0.8	0	0	0
Secondary education	1.6	1.4	2.4	1.3	4.8
No education	0	0	0	0	26.8
		2035			
Tertiary education	3.0	2.6	0.0	0.0	0.0
Secondary education	2.2	1.9	4.0	2.5	15.3
No education	0.0	0.0	0.0	0.0	21.8

** Endowments and education categories listed in Table AI- 3.*

Source: ILO data on education totals, Walmsley and Carrico (forthcoming) for occupation totals and authors' model results and calculations.

To model labor supply by occupation, we introduce forecasts of labor by education (Table AII- 3) and then include a constant elasticity of transformation (CET) that allows workers of a given education level to respond to wages and move between occupations.[37] This means that as a country like Vietnam educates its workers, the

37 Movement can occur in both directions, although if there are no workers of a particular education in an occupation then the model will not move these workers into that category. For instance, in none of the GTAP countries did uneducated labor get allocated to managers and/or technicians; or tertiary educated workers to low skilled jobs. This does not mean there are no tertiary educated workers in low skilled occupations, it is just a result of the allocation process that assumes that tertiary educated workers are allocated first to the top two high skilled occupations and then to the mid-level occupations. In no country did the number of workers with a tertiary education exceed the number of workers in the top four occupations, and vice versa for the

composition of workers across occupations will change as the average education level of all occupations rises. Specifically, as the number of uneducated workers falls, the wages of occupational groups that rely on uneducated workers (i.e., low skilled workers) will rise (Table AII- 5: Wages).

Table AII- 5: Average annual growth in labor supply, wages and productivity in Vietnam (percent)*

	2008-2014	2015-2020	2021-2025	2026-2030	2031-2035
LABOR SUPPLY BY OCCUPATION					
Office managers and professionals	3.82	2.41	2.1	2.17	2.09
Technicians and associate professionals	3.65	2.36	2.14	2.21	2.09
Clerks	2.35	1.69	1.42	1.47	1.52
Service and shop workers	3.45	2.12	1.94	1.91	1.89
Low skilled workers	1.72	0.68	0.17	0.02	-0.22
WAGES					
Office managers and professionals	0.26	3.58	3.3	2.42	1.89
Technicians and associate professionals	0.2	3.56	3.32	2.44	1.89
Clerks	0.44	3.72	3.44	2.66	2.17
Service and shop workers	0.8	3.86	3.61	2.81	2.29
Low skilled workers	2.07	4.45	4.03	3.18	2.49
PRODUCTIVITY GAINS					
Office managers and professionals	0.57	0.28	0.25	0.31	0.28
Technicians and associate professionals	0.43	0.22	0.19	0.24	0.22
Clerks	0	0	0	0	0
Service and shop workers	0	0	0	0	0
Low skilled workers	0.94	0.67	0.73	0.81	0.81

** Endowment categories listed in Table AI- 3.*

Source: Authors' model results and calculations.

This rise in the wages of low skilled workers will cause more secondary educated workers to move into this low-skilled occupation category to replace the declining number of uneducated workers. Hence the supply of low skilled workers will not fall to the same extent as the growth in uneducated workers might imply. Instead the influx of workers with a secondary education into the low skilled occupation causes the share of low skilled workers with a secondary education to increase from 15 percent in 2007 to 41 percent by 2035 (Table AII- 4). Moreover as more workers obtain a tertiary education and become managers and technicians, workers with a secondary education will be pushed out of these higher skilled occupations (managers and technicians) towards the lower ones (clerks, sales/services and low skilled). The share of managers with a secondary education falls

uneducated workers. In order to ensure that workers with a secondary education could move both up and down across all the occupations we ensured that there was at least one secondary worker in all occupations.

from 64 percent in 2007 to 42 percent by 2035. This is consistent with what we see when we compare the bilateral education/occupation data of developed and developing countries. As education rises, the average education level of each occupation rises and less educated workers are pushed out of the higher skilled jobs to take on lower skilled jobs (Table AII- 4). The resulting changes in labor supply by occupation are shown in Table AII- 5 (labor supply).

In addition to movement of labor between occupations we also allow for differences in productivities of workers, by education and occupation. Using data on education, occupation and wages, we find that tertiary workers earn approximately 1.5 times more than workers with a secondary education within the same occupation category; and workers with a secondary education earn 2 to 5 times more than a worker who has only a primary education or no education at all. If we assume these differences are related to productivity differences between the different workers due to education, then we can allow for the possibility that as the education level of the average worker in each occupation changes, there is also an endogenous productivity gain/loss.[38] In our example of Vietnam above, as the share of secondary educated workers in the low skilled occupation rises from 15 to 41 percent and the education level of managers and technical workers also rises as the share of tertiary educated workers rises from 36 to 58 percent (Table AII- 4), productivity of the low skilled and of the two upper level occupations also increases (Table AII- 5: productivity). The productivity of the mid-level occupations (sales and service and clerks) depends on the extent to which uneducated workers, who previously held these positions, are 'driven out' to lower skilled occupations or (eventually) as tertiary workers accept jobs in these mid-level occupations (clerks and service workers). In the case of Vietnam the underlying data on education and occupation suggests that there were few or no uneducated workers working as clerks or service workers in the underlying data in 2007 (Table AII- 4)[39], and since the number of secondary educated workers rose relative to uneducated there was no motivation (in the form of rising wages of clerks and service workers) that would cause uneducated workers to move up into these occupations. The supply of tertiary educated workers in these mid-level occupations also remained unchanged (and very low), since growth in tertiary education is not (yet) sufficient to cause these tertiary educated workers to move into these mid-level positions.

Finally, the baseline also allows for endogenous unemployment. This is only important during the global financial crisis period from 2008, which this baseline covers. After the crisis is over, labor returns to full employment.

TRADE

The cumulative growth in actual global exports between 2007 and 2014, along with forecasts between 2015 and 2019, are tracked as part of the baseline. These global exports targets are achieved by placing a "twist" variable

38 For more details on how this was implemented in the model please contact the authors.

39 The lack of uneducated workers in mid-level jobs reflects the fact that there are more low-skilled jobs than there are uneducated workers in 2007 (Table AII- 4). Our allocation process assumes that uneducated workers are first allocated to low skilled jobs, with any residual uneducated workers then allocated to mid-level jobs. If the number of low skill jobs exceeds the number of uneducated workers, there will be no uneducated workers in mid-level jobs. Unfortunately real data on workers by education and occupation are unavailable, though we would be interested in hearing of any new datasets.

on the upper level of the Armington that causes preferences to shift between domestic and imported commodities. Since global trade (actual and forecasted) during these periods is generally higher than that predicted by the model, we implement an increase in preferences for imports world-wide that raises exports to the actual/forecasted levels. This twist applies equally to both private consumers and firms demand for imports by commodity and country – it is not applied to government preferences.

In addition to tracking global trade, we also track Vietnam's total exports from 2007 to 2014. We do this by altering Vietnam's imports using a region-specific twist on Vietnam's private consumers' and firms' preferences for imports. The twist raises (or lowers) Vietnam's imports. Vietnam's exports are then raised through the equilibration of the balance of payments.

INCOME ELASTICITIES

The income elasticities are assumed to endogenously fall as per capita GDP of a country rises. The rate of the fall was determined by the way in which income elasticities for each commodity in the GTAP database change as countries' per capita GDP rises, bound at the lower end by the minimum income elasticity in the GTAP data for that commodity. The rate of decline in these income elasticities was found to be most important for rice and other grains (consistent e.g. with Anderson and Strutt 2014).

Appendix III Trade Integration

Table AIII- 1: Trade agreements incorporated into baseline projections

Agreement	Entry into force	Full implementation	Sensitive products (per cent tariff lines as exclusions)	Notes
AGREEMENTS WITH CUSTOMIZED PHASE-OUT AND SENSITIVE PRODUCTS				
North American Free Trade Agreement	1993	2007	Dairy (US-Canada)	Sugar side agreements. Mexico corn, orange juice and kidney beans in dispute.
AUS-USA	2005	2023	USA-sugar, dairy, avocados, peanuts sugar, beef; AUS-Sugar – TRQs remain with lower (zero) in quota rates.	
USA-CHL	2004	2016	None.	Beef over 4 years; poultry over 10 years; Chile-dairy 4 – 8 years; TRQs on wheat, flour and sugar will remain in effect for 12 years.
USA-SNG	2004	2013	None-rules of origin apply.	Many products imported into the USA from SGN carry duty due to origin requirements
*ASEAN-AFTA	1993 (Singapore, Malaysia, Indonesia, Brunei, Philippines, Thailand); Vietnam 1995; Laos, Myanmar 1997; Cambodia 1999	2010 (ASEAN6)/2015-8 (CLMV)	2%	CLMV derogations

Agreement	Entry into force	Full implementation	Sensitive products (per cent tariff lines as exclusions)	Notes
Trans-Pacific Strategic Economic Partnership (TPSEP)	2006	New Zealand-2015; Chile-2017; Brunei-2015; Singapore –immediate.	New Zealand Zero %; Chile Zero%; Brunei Zero (except alcohol tobacco firearms)%; SGN Zero%[40]	
ASEAN-AUS-NZL	2010	2020	~1%	
MLY-NZL	2010	2016	Zero % New Zealand tariff lines by 2016; 0.5% of Malaysia imports from New Zealand by 2016[41]	
AUS-NZL	1983	Fully in force	None	No duties in the MM database
NZL-SNG	2001	TBD	New Zealand-zero%; SGN Zero%.	No duties in the MM database
CHN-NZL	2008	New Zealand 2016; China- 2012 except—Milk and cream 2019, meat and certain fruit and processed fruit 2016.	New Zealand none. China exempt sugar; rice; wheat; corn; flour; soybean, sunflower, corn, rapeseed cotton seed, peanut oil; certain wood products; paper; orange juice; fertilizer; urea; goat and lamb skins; cotton; wool; and paper products.	
CHL-VNM	2012	2022-CHL; 2026-VNM	4%-CHL; 5%-VNM	
**ASEAN-JPN	2008	2026-CLMV; 2018-ASEAN6; 2024-JPN	5%	Sensitive list is hard to define since they were negotiated on bilateral basis and are not limited by a cap.
**ASEAN-CHN	2007	2018-CHN\ASEAN6; 2020-CLMV	1%	Indonesia has requested negotiations on sensitive products with concession to be made to China for changes. While the agreement does not allow for exclusion of products, highly sensitive products are permitted reduced, but higher than zero rates.

40 From "The New Zealand – Singapore- Chile Brunei Darussalam Trans-Pacific Strategic Economic Partnership" New Zealand Ministry of Foreign Affairs and Trade.
41 From "The New Zealand-Malaysia Free Trade Agreement" New Zealand Ministry of Foreign Affairs and Trade.

Agreement	Entry into force	Full implementation	Sensitive products (per cent tariff lines as exclusions)	Notes
**ASEAN-KOR	2007	2016-KOR\ASEAN6; 2018-CLMV	1%	Thailand has a slightly different schedule. Some negotiations on services.
JPN-MLY	2006	2021	5%	Assume early agreement takes precedence over the AJFTA.
JPN-VNM	2009	2026-JPN; 2027-VNM	5%	Note, ASEAN Japan takes precedence over this agreement.
JPN-PHL	2008	2024	5%	A guide from the Philippine government states certain product may be covered under the JPEPA not covered under the AJFTA. However, rules of origin are more favorable under AJFTA. We default to ASEAN-JPN.
JPN-IND	2008	2024	5%	Indonesia has announced it has reopened negotiations on the Japan-Indonesia EPA since it has failed to provide the benefits it suggested for Indonesia. We use the ASEAN-Japan FTA.
JPN-KHM	2008	2026	5%	AJFTA
JPN-LAO	2008	2026	5%	AJFTA
JPN-BRN	2008	2024	5%	AJFTA
JPN-SNG	2008	2018	5%	Japan and Singapore entered into an EPA in 2002, but many goods were not liberalized until negotiations in 2007. We pick up EIF of these latter negotiations.
JPN-THL	2008	2024	5%	EPA exempts 8 percent of Japanese tariff lines and 3 percent of Thai Tariff lines, with most Japanese imports of agriculture exempt. AJFTA seems to be a better deal.

Agreement	Entry into force	Full implementation	Sensitive products (per cent tariff lines as exclusions)	Notes
CHN-CHL	2006	10 Years	3%	
Agreements with Simplified Phase-Out Schedule				
AUS-CHL	2009	10 Years after EIF	5%	Actual full implementation 2015
AUS-MLY	2013	10 Years after EIF	5%	Actual full implementation 2020
AUS-SNG	2003	10 Years after EIF	5%	
AUS-US	2005	10 Years after EIF	5%	
JPN-CHL	2007	10 Years after EIF	5%	
JPN-MEX	2005	10 Years after EIF	5%	
JPN-PER	2012	10 Years after EIF	5%	
MLY-CHL	2012	10 Years after EIF	5%	
SNG-PER	2009	10 Years after EIF	5%	
USA-PER	2009	2025	--	No sensitive products specified in agreement, but quantitative limits on selected agriculture products have been reported.
CHN-CHL	2006	10 Years	3%	
CHN-PER	2010	10 Years	3%	
CHN-SGN	2009	10 Years	3%	
CHN-THL	2003	10 Years	3%	Opened up most agriculture.
KOR-CHL	2004	10 Years	5%	
KOR-PER	2011	10 Years	5%	
KOR-SGP	2006	10 Years	5%	

**ASEAN AFTA requires countries to reduce tariffs to a range of zero-5%. We apply zero, realizing countries have the option to maintain 5%.*

***In many cases, regional economic cooperation agreements and bilateral FTAs overlap. It is beyond the scope of this project to determine for which products one agreement or the other might be used to claim preferences, since rules of origin combined with tariff rates under the different agreements will determine the eligibility for preferences. We therefore apply the tariff phase out schedule from the earliest agreement – assuming the latter agreement is largely a choice about rules of origin. This is not to say these choices do not have consequences, but analysis is beyond the scope of this study.*

Sources: US Congressional Research Service, UNESCAP, New Zealand Ministry of Foreign Affairs and Trade (MFAT), Asia Regional Integration Center (Asian Development Bank), ASEAN Secretariat, Ministry of Foreign Affairs of Japan (MOFA), Singapore FTA Network (Ministry of Trade and Industry, Singapore).

Table AIII- 2: Overview of assumptions employed in CGE modeling of TPP and FTAAP

		Tariffs		NTMS			
Study	**Trade agreements covered**	**Removed from baseline data**	**Assumptions on tariff reduction**	**Services**	**Goods**	**Preference Utilization**	**Investment**
PREVIOUS STUDIES							
Petri, Plummer and Zhai (2001 and 2012)	TPP, Asia Track, FTAAP and numerous tracks toward FTAAP. TPP included nine countries and was expanded in future years	YES, over 60 agreements\bilateral adjustments have been included in the baseline.	Phase-out: 12 years; Adjustments for tariffs to zero on entry into force (EIF); sensitive products	Estimates of NTMs based on unpublished Peterson Institute publication. 50% cut in services NTMs assumed (no analysis provided)	Estimates of goods NTMs based on World Bank data (Kee et al. 2009). Manufactures and agriculture aggregate estimates. 50% cut in NTMS assumed	Adjustments for preference utilization as trade agreement grow.	YES-A2012 paper included analysis outside the CGE model was brought in to adjust investment figures for changes in investment barriers.
Areetat and Kameyama (2012)	TPP (7 countries) and expansion of TPP to include Japan, Korea, and China.	No, tariffs as of 2004 V7 of the GTAP database.	Complete liberalization	None	None	None	None-Static CGE
Itakura and Lee (2012)	Gradual enlargement of TPP to include other East Asian blocks.	No	Reduced to zero in phases.	YES-Author's estimates from gravity estimates. NTMs on services lowered by 25%	None	None	GDyn rate of return driven investment.
Li and Whalley (2013)	Integration of China into a TPP	No	Complete liberalization	None	None	Halve tariff cuts.	None
VIETNAM: 2035							
Minor, Walmsley, and Strutt (2015) (current report)	TPP—FTAAP – enlargement of TPP through docking of APEC countries in trade blocks – KJC- ASEAN-Other APEC to achieve a TPP based FTAAP.	YES, over 60 agreements\bilateral adjustments have been included in the baseline.	Phase out depending on two regional definitions-10 and 15 years phase out. LDCs with 15 years. Sensitive products. EIF depending on country groups.	Estimates of NTMs based on CEPII 2011 estimates. NTM cuts are to regional best performers or the average of the region.	Estimates of goods NTMs based on World Bank data (Kee et al. 2009). Manufactures and agriculture aggregate estimates. NTM cuts are to regional best performers.	None	GDyn rate of return driven investment.

Source: Authors' compilation.

Table AIII- 3: Country groups and flexibilities

Group	Countries
A—Upper income and high income countries	Australia, Brunei, Canada, Chile, China, Hong Kong China, Japan, South Korea, Malaysia, New Zealand, Russia, Singapore, ROC, USA
B—All others with flexibilities	Mexico, Papua New Guinea, Peru, Vietnam, Indonesia, the Philippines, and Thailand

Source: Authors' compilation.

Table AIII- 4: Ad-valorem equivalents (AVE) of non-tariff measures on goods trade in the TPP and FTAAP region, by sector (percent)

			Change required to harmonize goods NTMs within a region			
	Overall trade restrictiveness AVE		Top quintile of the TPP region		Mean of Korea-China-Japan	
Country	Agriculture	Manufactures	Agriculture	Manufactures	Agriculture	Manufactures
Australia	28.8	4.2	11.6	1.8	--	--
* ASEAN nec	23.6	5.5	8.3	4.3	--	--
Canada	11.4	2.4	0.0	0.0	--	--
Chile	17.2	1.3	0.0	0.0	--	--
China	6.1	5.1	0.0	2.7	0.0	2.1
Indonesia	11.5	0.5	0.0	0.0	--	--
Japan	23.6	3.8	6.4	1.4	13.5	0.8
Korea	0.6	0.1	0.0	0.0	0.0	0.0
Malaysia	23.6	5.5	6.4	3.1	--	--
Mexico	26.1	12.3	8.9	9.9	--	--
New Zealand	23	7.3	5.8	4.9	--	--
Peru	22.5	2.9	5.3	0.5	--	--
Philippines	34.3	15.4	17.1	13.0	--	--
**Singapore	20.3	0.8	0.0	0.0	--	--
***Taiwan	0.6	0.1	3.1	0.0	--	--
Thailand	24.9	0.6	0.0	0.0	--	--
USA	14.8	3.3	7.7	0.0	--	--
*Vietnam	23.6	5.5	6.4	3.1	--	--

**Estimated with the average of Thailand, Indonesia and the Philippines. Includes Brunei Darussalam.*

***Assumed to be the same as Hong Kong.*
****Assumed to be the same as Korea.*

Source: Kee et al. 2009. Downloaded April 2014 from http://go.worldbank.org/FG1KHXSP30. Indexes updated by Kee et al. July 2012.

Table AIII- 5: Ad-valorem equivalents of services barriers in the FTAAP region, by sector*

Country	Air and other transport	Business, insurance and other financial services	Construction	Government services	Other services	Trade and communication
Australia	29.2	63.3	126.8	44.4	--	54.6
*Cambodia	45.0	45.5	56.7	43.5	--	39.8
Canada	28.4	29.0	73.9	35.9	--	41.9
Chile	22.9	77.2	133.3	40.3	--	43.9
China	116.8	77.5	45.6	59.6	--	36.3
Indonesia	54.7	33.8	112.9	38.3	--	39.1
Japan	30.8	46.5	25.7	48.4	--	44.6
Korea	21.9	31.8	101.6	36.2	--	46.9
*Laos	45.0	34.2	56.7	43.5	--	45.5
Malaysia	22.2	46.4	8.4	31.6	--	51.8
Mexico	39.2	49.9	135.8	38.9	--	51.2
New Zealand	26.5	52.4	88.1	45.4	--	56.2
Peru	50.8	52.2	159.1	44.4	--	83.1
Philippines	26.9	52.0	17.6	58.9	--	43.1
Russia	23.4	38.0	44.9	42.1	--	43.1
Singapore	14.7	11.6	67.8	15.0	--	10.5
Thailand	50.7	30.8	39.6	33.3	--	31.2
USA	19.8	43.9	95.4	8.8	--	52.8
*Other ASEAN group	44.2	47.7	56.7	43.5	--	40.6
*Vietnam	44.2	47.7	56.7	43.5	--	40.6

Source: Fontagné et al. 2011. Trade weighted by the authors using MAcMap 2007 database (Bouët et al. 2004). Other ASEAN group includes Brunei, Myanmar, and East Timor.

Table AIII- 6: Reduction to ad-valorem equivalent of services barriers to reach top quintile in TPP region*

Country	Air and other transport	Business, insurance and other financial services	Construction	Government services	Other services	Trade and communication
Australia	9.6	23.6	80.1	21.1	--	14.2
Canada	9.1	0.0	27.2	12.6	--	4.2
Chile	0.2	37.8	86.6	17.0	--	1.6
Japan	9.2	8.4	0.0	25.1	--	5.1
Malaysia	2.1	9.2	0.0	8.3	--	13.1
Mexico	20.3	17.9	89.1	15.6	--	8.9
New Zealand	6.6	14.7	41.4	22.1	--	15.0
Peru	31.6	16.3	112.4	21.1	--	43.4
Singapore	0.0	0.2	21.1	0.0	--	3.8
USA	1.3	6.4	48.7	0.0	--	12.9
*Brunei	24.6	9.2	10.0	20.2	--	6.5
Vietnam	24.6	9.2	10.0	20.2	--	6.5

**The GTAP database does not include data for Brunei separate from regional aggregates, Vietnam weights were employed for Brunei. Brunei is part of the Other ASEAN category. Cuts are calculated at the bilateral level, trade-weighted to the values in the table and are averages of the actual cuts applied between TPP countries.*

Source: Authors calculations from ***Error! Reference source not found.****.*

Table AIII- 7: Reduction to ad-valorem equivalent of services barriers to mean China, Japan and Korea*

Country	Air and other transport	Business, insurance and other financial services	Construction	Government services	Other services	Trade and communication
China	11.6	6.4	0.0	1.5	--	0.5
Japan	0.4	0.0	0.0	0.0	--	0.5
Korea	0.0	0.2	25.9	0.0	--	4.7

** Cuts are calculated at the bilateral level, trade-weighted to the values in the table and are averages of the actual cuts applied between China, Korea and Japan countries.*

Source: Authors model results and calculations.

Table AIII- 8: Reduction to ad-valorem equivalent of services barriers to reach top quintile in FTAAP region

Country	Air and other transport	Business, insurance and other financial services	Construction	Government services	Other services	Trade and communication
Australia	3.5	2.2	17.9	1.8	0.0	3.0
Canada	1.9	0.0	6.3	0.3	0.0	0.5
Chile	0.0	4.9	23.8	2.0	0.0	0.7
China	88.0	36.1	0.0	34.9	0.0	3.0
Indonesia	35.6	6.9	66.2	15.0	0.0	9.7
Japan	2.5	1.2	0.0	2.8	0.0	0.9
Korea	4.7	3.6	32.3	12.9	0.0	1.4
Malaysia	0.7	1.9	0.0	1.1	0.0	3.5
Mexico	4.2	1.2	9.6	0.4	0.0	1.4
New Zealand	2.0	2.5	18.9	3.0	0.0	4.8
Peru	9.6	3.0	53.5	2.4	0.0	11.5
Philippines	8.0	12.9	0.0	35.6	0.0	4.2
Russia	4.1	3.9	0.0	18.8	0.0	5.2
Singapore	0.0	0.0	0.9	0.0	0.0	0.6
Thailand	32.1	0.9	0.0	10.0	0.0	0.8
USA	0.9	1.5	19.2	0.0	0.0	3.7
Vietnam	6.7	0.6	4.8	2.1	0.0	1.4

Source: Authors' compilation

Table AIII- 9: Vietnam change in real GDP due to TPP, 2020-2035 (average annual growth)*

	2020	2025	2030	2035
BASELINE				
Average annual GDP growth	6.4	6.0	5.6	5.5
GDP ANNUAL GROWTH FROM TPP				
Tariffs	0.2	0.4	0.2	0.0
Goods NTMs	0.4	0.2	0.0	0.0
Services NTMs	0.2	0.1	0.0	0.0
Total TPP	0.8	0.6	0.3	0.0
PROJECTED AVERAGE ANNUAL GDP GROWTH WITH TPP				
TPP augmented average annual GDP growth	7.1	6.6	5.9	5.5

**Average annual includes the average of the previous five year period, inclusive.*

Source: Authors' model results and calculations.

Table AIII- 10: Vietnam's change in real GDP due to FTAAP, 2020-2035 (average annual growth)*

	2020	2025	2030	2035
BASELINE				
Average annual GDP growth	6.4	6.0	5.6	5.5
GDP ANNUAL GROWTH FROM TPP				
Total TPP	0.8	0.6	0.3	0.0
GDP ANNUAL GROWTH FROM FTAAP				
Tariffs	-0.0	-0.1	-0.1	0.0
Goods NTMs	-0.1	0.8	0.2	0.0
Services NTMs	0.1	0.2	0.1	0.1
Total FTAAP	0.0	0.9	0.3	0.1
PROJECTED AVERAGE ANNUAL GDP GROWTH WITH TPP AND FTAAP				
TPP and FTAAP augmented average annual GDP growth	7.1	7.5	6.1	5.6

**Average annual includes the average of the previous five year period, inclusive.*

Source: Authors' model results and calculations.

Table AIII- 11: Vietnam's change in real exports due to TPP and FTAAP, 2025 -2036 (cumulative percent change from mid-growth baseline)*

	2025			2030			2035		
	Difference from baseline		Percent change	Difference from baseline		Percent change	Difference from baseline		Percent change
	TPP	FTAAP		TPP	FTAAP		TPP	FTAAP	
Agriculture	159.7	154.8	-1.9	292.9	294.0	0.3	474.9	483.8	1.5
Oil, gas, minerals	102.8	99.9	-1.4	159.1	157.4	-0.7	228.6	226.9	-0.5
Manufactures	314.7	325.6	2.6	483.5	513.1	5.1	666.8	738.5	9.4
Services	327.9	319.2	-2.0	711.2	716.5	0.7	1341.2	1369.9	2.0

** Aggregated sectors are listed in Table 2-1, column III. Agriculture includes processed food.*

Source: Authors' model results and calculations.

Table AIII- 12: Vietnam's change in real imports due to TPP and FTAAP, 2025 – 2035 (cumulative percent change relative to mid-growth baseline)*

	2025			2030			2035		
	Difference from baseline			Difference from baseline			Difference from baseline		
	TPP	FTAAP	Percent change	TPP	FTAAP	Percent change	TPP	FTAAP	Percent change
Agriculture	212.1	216.6	1.5	326.0	337.4	2.7	455.1	476.2	3.8
Oil, gas, minerals	183.0	188.6	2.0	286.0	300.5	3.7	411.5	436.4	4.9
Manufactures	231.1	235.7	1.4	348.2	362.0	3.1	473.0	505.4	5.6
Services	328.4	343.5	3.5	521.0	547.1	4.2	749.4	790.2	4.8

** Aggregated sectors are listed in Table 2-1, column III. Agriculture includes processed food.*

Source: Authors' model results and calculations.

Appendix IV State Owned Enterprises

Table AIV- 1: Vietnamese state owned enterprises, sales and assets, projected increase in output by sector with a fifty percent restructuring of SOE assets out of the SOE sector

GTAP code	Study sector	Enterprise survey description	Projected asset performance	Sales			Assets			Projected increase in sales / sector productivity
				Total	SOE	SOE to total	Total	SOE	SOE to total	
B_T	Processed food	Food and beverage production	Improvement	1,127,960	117,777	10%	659,735	76,699	12%	1%
CNS	Construction, insurance, business services	Construction	Improvement	911,703	203,782	22%	1,807,027	432,949	24%	1%
ELE	Electrical machinery and metals	Office and computer equipment production	Improvement	766,202	4,594	1%	244,134	7,641	3%	1%
OFI	Construction, insurance, business services	Financial intermediary (excluding insurance and social welfare)	Improvement	428,312	44,685	10%	126,310	50,764	40%	25%
FMP	Electrical machinery and metals	Metal products (except machines and equipment)	Improvement	298,492	14,475	5%	349,405	18,355	5%	0%
TRD	Trade, transport and communications	Vehicle sales, maintenance and repair; retail sale of gas	Improvement	293,907	8,012	3%	175,299	8,036	5%	1%
CRP	Chemicals, rubber and plastics	Chemicals and chemical products	Improvement	293,556	74,194	25%	225,961	68,050	30%	3%
NMM	Oil, gas, minerals	No improvement-metal mineral products production	Improvement	276,183	74,224	27%	413,061	121,591	29%	2%
I_S	Electrical machinery and metals	Metal production and processing	Improvement	258,510	32,239	12%	201,852	27,560	14%	1%
TEX	Textiles, apparel, and leather	Textile	Improvement	223,625	17,535	8%	210,636	22,048	10%	1%
CRP	Chemicals, rubber and plastics	Plastic and rubber production and products	Improvement	202,202	13,683	7%	174,800	12,929	7%	0%
OTP	Trade, transport and communications	Services in transport; tourist services	Improvement	197,261	68,068	35%	242,841	193,721	80%	112%

GTAP code	Study sector	Enterprise survey description	Projected asset performance	Sales			Assets			Projected increase in sales / sector productivity
				Total	SOE	SOE to total	Total	SOE	SOE to total	
OTP	Trade, transport and communications	Road, railroad and pipeline transport	Improvement	192,590	44,072	23%	200,661	119,810	60%	46%
OTN	Transport and other manufactures	Other means of transportation (boats, railroad, airplane)	Improvement	186,330	21,936	12%	163,674	54,402	33%	16%
OMF	Transport and other manufactures	Furniture production and other productions No improvement specified elsewhere	Improvement	161,728	3,358	2%	158,348	3,504	2%	0%
LEA	Textiles, apparel, and leather	Leather tanning and leather products including wallets, seats, suitcases	Improvement	153,625	1,132	1%	103,783	938	1%	0%
OBS	Construction, insurance, business services	Activities relating real-estate	Improvement	153,404	24,577	16%	22,756	5,168	23%	4%
MVH	Transport and other manufactures	Motor vehicles and spare parts	Improvement	115,627	7,609	7%	87,321	10,124	12%	3%
LUM	Forestry and wood products	Wood, bamboo, rattan processing and production of wood, bamboo and rattan products	Improvement	84,521	4,405	5%	93,303	5,650	6%	0%
B_T	Processed food	Tobacco production	Improvement	63,812	57,532	90%	43,746	40,851	93%	24%
OME	Electrical machinery and metals	Other equipment and machinery No improvement specified elsewhere	Improvement	54,170	2,429	4%	60,157	4,165	7%	1%
ATP	Trade, transport and communications	Airline transport	Improvement	52,473	17,640	34%	249,068	131,718	53%	20%
PPP	Transport and other manufactures	Printing and publishing (books, magazines, newspapers, and	Improvement	46,302	15,967	34%	44,705	17,578	39%	4%
OBS	Construction, insurance, business services	Computer-related activities	Improvement	33,538	676	2%	32,129	16,015	50%	48%

GTAP code	Study sector	Enterprise survey description	Projected asset performance	Sales			Assets			Projected increase in sales / sector productivity
				Total	SOE	SOE to total	Total	SOE	SOE to total	
OFI	Construction, insurance, business services	Assistance in finance (including social insurance)	Improvement	11,994	1,890	16%	337,678	98,125	29%	9%
ROS	Other services (govt and private)	Housework services provided at client's home	Improvement	19	0	0%	20	0	0%	0%
TRD	Trade, transport and communications	Wholesale and agent sales (excluding motor vehicles and motorbikes)	No	4,388,260	1,425,207	32%	2,477,150	710,642	29%	0%
TRD	Trade, transport and communications	Retail sales (excluding motor vehicles and motorbikes);repairs of family appliances	No	819,065	244,134	30%	303,069	39,094	13%	0%
OME	Electrical machinery and metals	Other electronic, electric equipment No improvement specified elsewhere	No	180,323	15,505	9%	126,880	7,154	6%	0%
WAP	Textiles, apparel, and leather	Fur processing and fur products (excluding garments)	No	171,905	8,861	5%	125,068	5,257	4%	0%
CMN	Trade, transport and communications	Post and telecommunications	No	167,528	138,164	82%	2,857,241	433,838	15%	0%
OBS	Construction, insurance, business services	Science and technology improvement activities	No	160,310	40,010	25%	1,439,986	112,360	8%	0%
TRD	Trade, transport and communications	Hotel and restaurant (including big and small restaurants, cafe, beverage and drink	No	147,094	30,065	20%	494,039	61,302	12%	0%
P_C	Oil, gas, minerals	Coke, crude oil, uranium processing	No	142,101	130,698	92%	91,317	82,378	90%	0%
PPP	Transport and other manufactures	Paper and paper products	No	109,200	8,746	8%	115,497	8,436	7%	0%

GTAP code	Study sector	Enterprise survey description	Projected asset performance	Sales			Assets			Projected increase in sales / sector productivity
				Total	SOE	SOE to total	Total	SOE	SOE to total	
AGR	Agriculture-only one category	Agriculture and relating services (including livestock raising)	No	102,342	82,251	80%	259,002	191,953	74%	0%
WTP	Trade, transport and communications	Water transport	No	94,638	49,109	52%	57,170	7,731	14%	0%
ISR	Construction, insurance, business services	Insurance and pensions (excluding social insurance)	No	30,651	13,765	45%	100,676	15,070	15%	0%
FSH	Fish and livestock	Catching and raising sea products, and relating services	No	26,346	11,281	43%	18,808	4,925	26%	0%
OBS	Construction, insurance, business services	Other business activities (accounting, tax and other consulting,	No	22,312	7,200	32%	3,213	29	1%	0%
OMF	Transport and other manufactures	Recycling, reprocessing	No	20,895	14,579	70%	33,638	21,554	64%	0%
OBS	Construction, insurance, business services	Rental of machines and equipment (excluding operators); rental of furniture and hou	No	13,516	2,228	16%	39,829	976	2%	0%
FRS	Forestry and wood products	Sylviculture and relating services	No	6,704	4,600	69%	28,788	9,292	32%	0%
ELY	Other services (govt and private)	Electricity, gas, water steam, hot water production and distribution	Strategic	853,579	816,213	96%	1,663,112	1,599,926	96%	0%
OIL	Oil, gas, minerals	Oil and gas drilling and related services,(except: exploring/searching activities)	Strategic	271,087	140,402	52%	1,856,169	1,646,494	89%	0%
COA	Oil, gas, minerals	Coal mining	Strategic	260,483	253,463	97%	246,917	240,133	97%	0%
ROS	Other services (govt and private)	Other service activities (laundry, hairdressing, funerals,…)	Strategic	143,039	115,090	80%	45	0	0%	0%

GTAP code	Study sector	Enterprise survey description	Projected asset performance	Sales			Assets			Projected increase in sales / sector productivity
				Total	SOE	SOE to total	Total	SOE	SOE to total	
OMN	Oil, gas, minerals	Mining for rocks, stone, sand, salt, fertilizer...	Strategic	133,419	94,599	71%	187,238	133,323	71%	0%
WTR	Other services (govt and private)	Water exploitation, purification, and distribution	Strategic	32,177	28,974	90%	100,922	90,988	90%	0%
ROS	Other services (govt and private)	Cultural and sport activities (broadcasting, television, cinema, recreation and entertainment)	Strategic	18,004	1,802	10%	41	1	2%	0%
OMN	Oil, gas, minerals	Metal mining	Strategic	17,815	4,641	26%	38,921	9,667	25%	0%
OSG	Other services (govt and private)	Education and training	Strategic	15,211	43	0%	22,281	338	2%	0%
OSG	Other services (govt and private)	Health and social relief (hospitals, health centers, veterinary care, social relief,	Strategic	13,012	107	1%	68,129	3,310	5%	0%
OSG	Other services (govt and private)	Government administration and national defense; promulgated social insurance	Strategic	5,486	73	1%	33,935	1,809	5%	0%
OSG	Other services (govt and private)	Disposal collection, public sanitation improvement, and similar activities	Strategic	171	133	78%	119,134	78,413	66%	0%
ROS	Other services (govt and private)	Communist party, mass organizations, professional associations	Strategic	7	1	14%	396	262	66%	0%

Source: Vietnam Enterprise Survey (2008-2013) provided by the World Bank Group and authors' compilations.

Appendix V Impact of SOE Reforms under Alternative Growth Scenarios

The impact of the SOE reforms are slightly affected by the underlying baseline, although one needs to take into account the fact that with higher global growth, the baseline level to which the percent change is applied has also increased. Hence as global growth increases in the baseline, the impact of the SOE reforms on real GDP and exports is greater in both percentage and absolute terms (Table AV- 1). Private consumption and savings also increase more with higher global growth in the baseline, although in percentage terms this is only seen in the short run. With higher global growth the cumulative difference in investment falls relative to the appropriate baseline (Table AV- 1), however as mentioned previously the percent change is applied to a higher baseline level of investment that leads to a larger increase in capital stock. As capital stocks increase more quickly, they drive down rates of return faster, which then has implications for investment, which reduces more quickly over time.

Table AV- 1: Overview of SOE reform impacts on Vietnam 2020-2035 (cumulative percent change relative to low-, mid- and high-growth baselines)

	Low-growth		Mid-growth		High-growth	
	2025	2030	2025	2030	2025	2030
Real GDP	7.3	8.4	7.5	8.8	7.6	9.0
Private consumption	3.3	3.1	3.4	3.2	3.5	3.2
Government expenditure	1.8	1.8	1.8	1.8	1.8	1.7
Savings	4.9	4.6	5.0	4.7	5.1	4.6
Real exports	6.2	8.3	6.3	8.5	6.4	8.7
Real imports	6.2	5.9	6.1	5.9	6.0	5.9
Real investment	15.2	9.0	14.8	9.0	14.5	8.6

Source: Authors' model results and calculations

Table AV- 2 shows the impact on Vietnam's output of the SOE reforms under the alternative baselines. The higher absolute growth from the SOE reforms, relative to the high-growth scenario causes even more competition amongst sectors for resources and hence the returns (rental and wages) to factors increase further. The increased competition tends to moderate the

impact of the SOE reform on services, while agriculture appears to do slightly better, due to the fact that this sector declined further in the high-growth baseline relative to the mid-growth.

Table AV- 2: Vietnam's change in real output due to SOE reform, by sector, 2020-2035 (cumulative percent change relative to low-, mid- and high-growth baselines and share in value added)

	2020	2025	2030	2035
	LOW-GROWTH			
Agriculture	-2.1	-0.7	0.4	1.0
Oil, gas, minerals	-0.5	0.5	0.8	0.8
Manufactures	6.0	9.4	10.4	10.5
Services	9.3	11.5	12.0	11.5
	MID-GROWTH			
Agriculture	-2.0	-0.4	0.9	1.7
Oil, gas, minerals	-0.5	0.5	0.8	0.8
Manufactures	6.1	9.5	10.6	10.7
Services	9.1	11.1	11.7	11.2
	HIGH-GROWTH			
Agriculture	-1.9	-0.1	1.5	2.4
Oil, gas, minerals	-0.5	0.5	0.8	0.8
Manufactures	6.2	9.7	10.8	10.8
Services	8.9	10.7	11.4	11.1

** Aggregated sectors are listed in Table 2-1, column III. Agriculture includes processed food.*

Source: Authors' model results and calculations

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