Policy Research Working Paper 9021

Economic and Distributional Impacts of Free Trade Agreements

The Case of Indonesia

Massimiliano Calì
Maryla Maliszewska
Zoryana Olekseyuk
Israel Osorio-Rodarte

WORLD BANK GROUP
Macroeconomics, Trade and Investment Global Practice
September 2019

Policy Research Working Paper 9021

Abstract

As preferential trade agreements are growing in number and depth, assessment of their economic impacts has become more important to inform policy-makers facing a multitude of potential preferential trade agreements. This paper provides novel ex ante estimates of the impacts of two key preferential trade agreements currently negotiated by Indonesia, the largest economy in Southeast Asia. The paper then compares these estimates with those of other preferential trade agreements that Indonesia may negotiate in the future. To that end it, combines a dynamic, multi-country computable general equilibrium model and a microsimulation tool linking the macroeconomic results to household-level welfare. The results suggest that, among the preferential trade agreements considered, the European Union–Indonesia Comprehensive Economic Partnership Agreement (EU-CEPA) is expected to yield the largest gains for Indonesia in income, output, and exports. This result is due to a combination of large expected reductions in trade barriers and a high share of international trade between the partners. These macro effects translate into the highest expected income growth relative to the other preferential trade agreements at every point of the income distribution. However, the gains for the EU-CEPA are proportionately larger for richer households, unlike the other agreements considered. The regressive gains are mainly due to the increase in skill wage premia spurred by the additional demand for skill-intensive sectors, especially services.

This paper is a product of the Macroeconomics, Trade and Investment Global Practice. It is part of a larger effort by the World Bank to provide open access to its research and make a contribution to development policy discussions around the world. Policy Research Working Papers are also posted on the Web at http://www.worldbank.org/prwp. The authors may be contacted at mmaliszewska@worldbank.org.

Economic and Distributional Impacts of Free Trade Agreements: The Case of Indonesia[1]

Massimiliano Calì, Maryla Maliszewska, Zoryana Olekseyuk and Israel Osorio-Rodarte

Keywords: Trade agreements, CGE model, Indonesia, poverty.

JEL classification: F150, I32, F63, O53, C68

[1] We thank Ndiame Diop, Michael Ferrantino, Frederico Gil Sander and Irfan Mujahid for useful comments. Financial support from the Multi-Partner Facility for Trade and Investment Climate is gratefully acknowledged.

1. Introduction

The limited progress of the multilateral trade agenda in the last two decades has prompted countries to increasingly pursue regional and bilateral trade integration as an alternative. The number of preferential trade agreements (PTAs) in force and notified to the WTO more than quintupled between 1990 and 2015 (Hofmann et al., 2018). Not only has the number of trade agreements proliferated, but so has their 'depth' – or the extent to which they cover areas beyond tariff reductions, such as customs regulations, anti-dumping, countervailing measures, technical barriers to trade (TBT), sanitary and phytosanitary standards (SPS), services and investment provisions.

These deep agreements are poised to generate significant economic effects on the member countries, although some sectors and segments of the population could be negatively affected. The literature on distributional aspects of free trade agreements is still limited. Understanding these impacts would be important. First, it would allow policy makers to better evaluate the costs and benefits of the agreements. Second, it can help prepare measures to compensate the likely losers of the agreements. Third, it could help policy makers focus on the parts of the agreement yielding the highest returns.

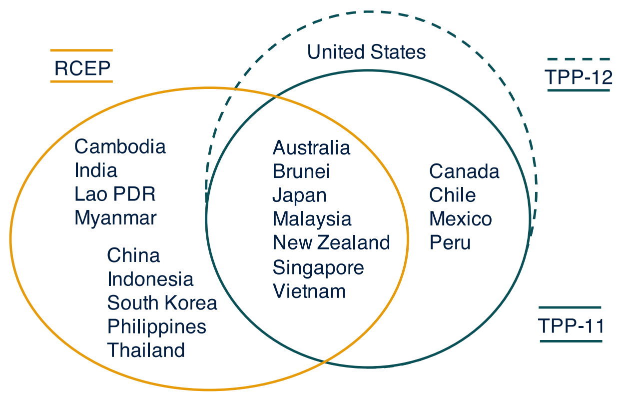
This paper helps fill this gap by providing novel estimates of the economic effects of some major PTAs on Indonesia. This is a relevant focus as Indonesia is the largest economy in Southeast Asia, a region with a historically low incidence of deep agreements compared to other Asian countries like Japan and the Republic of Korea. That appears to be rapidly changing, as Southeast Asian countries are increasingly involved in negotiations of deep PTAs. Indonesia is a case in point with the recent signing of a Comprehensive Economic Partnership Agreement (CEPA) with European Free Trade Association (EFTA) countries, and ongoing negotiations in the context of the Regional Comprehensive Economic Partnership (RCEP), as well as CEPAs with the EU and Australia.

The paper employs a global dynamic computable general equilibrium (CGE) model along with a micro-simulation tool to estimate the general equilibrium and distribution effects of various PTAs being negotiated or considered by Indonesia. The analysis focuses on two key PTAs that Indonesia is currently negotiating: RCEP, which is negotiated among 16 Asian economies, and the EU-IDN CEPA.[2] To provide some benchmarking, the paper also examines the potential impacts of two further important agreements that Indonesia may be joining in the foreseeable future: the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP) and the FTAAP (Figure 1). The former has been signed last March by the 12 member countries of the now

[2] RCEP is a proposed free trade agreement (FTA) between the 10 member states of the Association of Southeast Asian Nations (ASEAN) (Brunei, Cambodia, Indonesia, Lao People's Democratic Republic, Malaysia, Myanmar, the Philippines, Singapore, Thailand, and Vietnam) and the six states with which ASEAN has existing free trade agreements (Australia, China, India, Japan, Korea and New Zealand).

defunct Trans-Pacific Partnership (TPP) except the United States. Indonesia has recently signaled its intention to eventually join the CPTPP.[3] The FTAAP is an agreement among 21 Asia-Pacific Economic Cooperation (APEC) economies, which aims to link Pacific Rim economies from China to Chile including also the United States.

Figure 1 Membership of the TPP-11 (CPTPP), TPP-12 (CPTPP + USA), and RCEP



Source: Authors' elaboration

The analysis employs the LINKAGE model, which is a dynamic global CGE model particularly suited to capture the feedback mechanisms of trade shocks across countries. On the basis of trade and relative prices channels, the model evaluates the impact of a reduction of tariffs and NTMs brought about by the prospective agreements. The CGE model is then combined with the Global Income Distribution Dynamics (GIDD) microsimulation tool to study the impact of these potential PTAs on poverty and shared prosperity. In particular, GIDD distributes the macro-economic effects captured by the CGE analysis across households using Indonesia's National Socio-Economic Household Survey for the year 2014.

The results of the analysis suggest that out of the PTAs under investigation, the EU-CEPA would yield the largest macro-economic gains for Indonesia in terms of income, output and exports. Relative to the business as usual baseline scenario, Indonesian GDP is expected to increase by 2.13% as a result of the EU-IDN CEPA, compared to 0.18% and 0.89% in case of RCEP and FTAAP respectively. The large impact of the EU-IDN CEPA is mainly driven by the highest expected reductions in trade barriers and the high share of international trade between the partners. The signing of the CPTPP in its current 11-member version would have negligible impact on Indonesia due to the very low trade diversion compensated by the trade creation related to the agreement. On the other hand, joining the CPTPP along with other major Southeast Asian economies would generate a positive economic impact for Indonesia with an expected 0.58% increase in GDP.

These macro effects translate into reductions of poverty, albeit the growth incidence curves (along the income distribution) have important differences between the agreements. The EU-IDN CEPA yields the highest expected growth of income relative to the other PTAs at every point of the income distribution. However, the size of the gains grows monotonically with income for the EU-

[3] See: https://www.cnbc.com/2018/04/18/indonesia-is-on-path-to-joining-the-trans-pacific-partnership-finance-minister-says.html.

IDN CEPA while the growth incidence curve has a U-shape in the case of RCEP, and a mildly inverted U-shape for the other agreements. The regressive nature of the EU-IDN CEPA is mainly due to the increase in skill wage premia spurred by the additional demand for skill intensive sectors, services in particular.

The paper contributes to the large literature on the ex-ante impact of PTAs. The attention surrounding the negotiations of the original TPP and the Transatlantic Trade and Investment Partnership (TTIP) has reinvigorated this line of research. Given the depth of these agreements, studies have tried to incorporate as broad an array of policy changes as possible. Petri and Plummer (2016) focus on the impact of the original TPP on the 12 member countries using a global CGE model incorporating tariff and non-tariff measures in goods and non-tariff measures in services. Ciuriak and Xiao (2014) consider the economic impact of Taiwan, China's TPP accession on the United States. Francois et al. (2015) examine the effects of the TTIP on the agreement's members, the European Union and the United States. A common finding in these studies is that the reduction in non-tariff barriers typically exerts a larger impact than the reduction in tariffs, underscoring the increasing importance of NTMs as a trade barrier, a finding also reiterated here. This paper complements this literature in two key ways. First it provides results for a host of different agreements, which allows comparing between them, an ever more important feature for policy makers facing a multitude of potential (and at times competing) PTAs. Second, it distributes the general equilibrium effects across the income distribution, again a key piece of information for policy makers interested in reducing poverty and inequality.

The paper also relates to the specific literature on the economic impact of trade policy in Indonesia. Much of this literature is empirical mainly looking at the ex-post impact of import tariff liberalization on measures such as firms' performance (Amiti and Konings, 2007; Narjoko et al., 2018), wage premia (Amiti and Cameron, 2012) and poverty (Kis-Katos and Sparrow, 2015). Duggan et al. (2013) also look at the impact of liberalization of foreign investments in services (equivalent to a reduction of NTMs on services) on manufacturing productivity. The approach of these studies is inevitably partial equilibrium; Mahadevan et al. (2017) is closer to the spirit of this paper in that it assesses the general equilibrium and distributional impact of proposed increases in import tariffs on the Indonesian economy. In line with the empirical assessments, the authors find that the effects of increased protectionism are negative both overall and along the entire income distribution. This paper complements this Indonesia-specific literature by considering a different type of trade policy shock, which involves a wider array of trade measures than just tariffs and requires a multi-country modeling framework to properly capture feedback mechanisms that propagate across countries.

The paper is organized as follows: the next section discusses the simulation models used in the analysis; section 3 describes the different scenarios modeled and some of the key assumptions behind them; section 4 presents the general equilibrium results; section 5 links these results to the micro-simulation model to derive the distributional effects of the scenarios; and section 6 concludes.

2. Methodology

2.1. CGE model

Building on recent work of Petri and Plummer (2016), Petri et. al. (2012) and World Bank (2016a and b), the backbone of the economic modeling would be obtained by using the global dynamic CGE model LINKAGE (van der Mensbrugghe, 2011). The analysis includes 17 production sectors and 35 countries/ regions (see Table A1 in the Annex) and simulates the impacts of policy changes up to 2030, including reduction of tariffs and of NTMs in goods and services.

The core specification of the model replicates largely a standard global dynamic CGE model. Production is specified as a series of nested constant elasticity of substitution (CES) functions for the various inputs – unskilled and skilled labor, capital, land, natural resources (sector-specific), energy and other material inputs. LINKAGE uses a vintage structure of production that allows for putty-semi putty capital. In the labor market we assume fixed unemployment and labor participation rates. Demand by each domestic agent is specified at the so-called Armington level, i.e., demand for a bundle of domestically produced and imported goods. Armington demand is aggregated across all agents and allocated at the national level between domestic production and imports by region of origin.

The standard scenario incorporates three closure rules. First, government expenditures are held constant as a share of GDP, fiscal balance is exogenous while direct taxes adjust to cover any changes in the revenues to keep the fiscal balance at the exogenous level. The second closure rule determines the investment-savings balance. Households save a portion of their income, with the average propensity to save influenced by elderly and youth dependency rates, as well as GDP per capita growth rates. The savings function specification follows Loayza, Schmidt-Hebbel, and Serven (2000) with different coefficients for developed and developing countries. In the case of China and the Russian Federation, we target projections of investment or savings rates up to 2030 from World Bank regional reports. Since government and foreign savings are exogenous, investment is savings driven. The last closure determines the external balance. We fix the foreign savings and therefore the trade balance, hence changes in trade flows result in shifts in the real exchange rate.

This modeling framework allows to incorporate the complex interactions of productivity differences at the country, sector or factor level, shifts in demand as income rises, as well changes in comparative advantage and trade flows following trade liberalization. The applied multi-regional dynamic CGE model accounts simultaneously for interactions among producers, households and governments in multiple product markets and across several countries and regions of the world. The model incorporates well-developed dynamic features such as accumulation of capital through changes in savings and investment.

It is also worth noting some of the key limitations of the model, including the lack of positive dynamic feedback loops concerning the accumulation of knowledge and the absorption of foreign technology through PTAs-facilitated FDI. It also does not allow for modeling of extensive margins in exports. Therefore, the gains captured here may underestimate the eventual impact and represent the lower bound of potential benefits. In contrast, PTA-driven productivity increases in member countries could undermine the competitiveness of non-member countries and exacerbate the detrimental effects on non-member countries.[4]

2.2. Micro-simulation model

The impact of PTAs is differentiated across different types of households and workers. Such heterogeneity is key in determining the poverty and distributional impacts of any trade agreement. We use the GIDD modeling framework in order to model these distributional consequences of the macro-economic results of the PTAs.[5] The GIDD is a top-down macro-micro simulation framework, which distributes the macroeconomic results of the CGE model to households using SUSENAS 2014 as the source of data. The microeconomic model distributes the effects while keeping consistency with the aggregate behavior observed in the macro model. The two models operate mainly through changes in labor supply, skill formation, and real earnings, as a result, they are linked through key specific variables that reflect these changes (see Annexes 1 and 2 for details).

The micro simulation framework is performed in 5 steps. Steps 1 to 4 change the distribution of benefits across individuals, keeping the national average intact; while step 5 applies a distributional-neutral growth for all individuals. Briefly explained, step 1 changes the demographic structure of the household survey according to exogenous population and education projections. The second step allows for the migration of labor from shrinking to expanding sectors in the economy while changes in skill and sectoral wage premia are modeled in step 3. Step 4 adjusts for

[4] Another limitation of the model is that it does not incorporate the intended harmonization of labor and environmental standards within the CPTPP. While such harmonization has social and environmental benefits, it may also reduce competitiveness of firms that currently do not meet such standards, reducing the potential economic gains.

[5] GIDD was developed by the World Bank's Development Prospects Group and was inspired by previous efforts involving top-down simulation exercises. See Bourguignon, F., Bussolo, M., and Pereira da Silva, L. A. (2008); Davies (2009). Earlier versions of the GIDD can be found in Bourguignon and Bussolo (2013); and Bussolo, De Hoyos, and Medvedev (2010a, b). Recent modeling applications include distributional assessments of the effects of demographic change (Ahmed et al., 2014); Africa's resilience to climate, violence, and global economic stagnation (Devarajan et al., 2015), deeper regional trade integration in Eastern Africa (Balistreti et al., 2016), or the poverty and shared prosperity effects of China's economic slowdown and rebalancing (Lakatos et al., 2016).

changes in the relative prices faced by consumers. Lastly, step 5 accounts for economy-wide changes in per capita household consumption growth.[6]

3. Scenarios and assumptions

We first generate the long-term baseline, then run a number of counterfactual scenarios. By comparing the two, we can isolate the impacts of various policy changes.

Baseline

The GTAP 9 database is benchmarked to 2011. We run the model to 2018, replicating the key macroeconomic aggregates from the World Bank's *Global Economic Prospects* report (World Bank 2016a).[7] Population growth is based on the medium fertility variant of the 2012 UN's population projections. Labor force growth follows the growth of the working age population – defined here as the demographic cohort between 15 and 64 years of age. The evolution of supply of skilled and unskilled workers is consistent with the IIASA constant educational trends (CER) scenario, where growth rates of the supply of skilled workers exceed that of unskilled. Capital accumulation is equated to the previous period's (depreciated) capital stock plus investment. Productivity growth in the baseline is "calibrated" to achieve the growth rates for the baseline scenario (as in the World Bank (2016a)) up to 2018, then we fix the productivity growth for 2018-2030 to be consistent with historical trends. These productivity growth rates remain fixed in the counterfactual scenarios.

The baseline scenario also incorporates tariff reductions in existing PTAs. These are based on the data set provided by International Trade Center, including all TPP members FTA commitments up to 2030 (ITC and MAcMap (2015)). In addition, the baseline also includes pre-existing trade agreements among member countries (e.g., NAFTA, AFTA, the ASEAN-Japan FTA, the ASEAN-Australia-New Zealand FTA and the P4 Agreement among Brunei Darussalam, Chile, Singapore and New Zealand).

RCEP, FTAAP and EU-IDN CEPA

RCEP and FTAAP scenarios include liberalization of tariffs and NTMs following Wignaraja et. al. (2015). Initial tariffs are based on the GTAP data whereas NTMs are provided by Petri and Plummer (2016). The (trade-weighted) ad valorem equivalent NTMs for the different scenarios are reported in Table 1. For the countries that are also CPTPP members we use the CPTPP tariff schedules from ITC and MAcMap (2015) and MAcMap (2016). In case of RCEP, the

---

[6] For a detailed specification of the GIDD micro model see Osorio-Rodarte (2016).

[7] For China, we replicate the growth projections of World Bank (2013).

implementation of agreement is assumed to start in 2017 and import tariffs among the 16 members[8] are gradually reduced starting with a decline by 24% in 2017 up to 89% in 2027. In case of FTAAP, its implementation is assumed to start in 2021 and import tariffs among the member countries[9] are also gradually reduced starting with a decline by 46% in 2021 up to 94% in 2030. The EU-IDN CEPA is simulated using the assumptions for the EU-Vietnam FTA provided by Petri and Plummer (2016). Hereby, the initial GTAP tariffs are gradually reduced starting with a fall by 55% in 2018 and up to 94% in 2030.

Table 1. Indonesian and foreign trade-weighted NTMs before and after trade liberalization

	TPP11	TPP15	RCEP	FTAAP	EU-IDN
Initial trade weighted average NTM in IDN (over PTA members)	3.28%	3.18%	3.02%	4.26%	26.29%
Final trade weighted average NTM in IDN (over PTA members)		1.99%	2.46%	2.50%	15.38%
Initial foreign trade weighted average NTM that IDN faces on PTA markets	6.84%	5.53%	7.10%	6.70%	15.42%
Final foreign trade weighted average NTM that IDN faces on PTA markets		3.26%	5.46%	3.40%	7.96%

TPP -11 (CPTTP)

This scenario models the planned tariff cuts in accordance with the provisions of CPTPP among the members and on several key assumptions about the theoretically desirable and politically feasible ("actionable") cuts in NTMs and the actual cuts likely to follow from the implementation of the CPTPP. Although the agreement has to be ratified by all member countries, executed simulations assume its implementation will begin in 2017.

Tariff cuts under the existing PTAs as well as tariff commitments under the TPP follow the published schedules under the agreements as documented in ITC and MAcMap (2015) and MAcMap (2016). The authors document tariff reductions due to the existing PTAs signed by CPTPP members up to 2031 as well as the CPTPP commitments up to 2046 at the HS6 digit level.

Reductions in actionable NTMs follow the approach of Petri and Plummer (2016) and are assumed to be similar to the agreement between Korea and the United States (KORUS), including some

[8] The member countries of RCEP include Australia, Japan, Malaysia, New Zealand, Vietnam, Singapore, Brunei Darussalam, China, Korea, Indonesia, the Philippines, Thailand, India, Cambodia, Lao People's Democratic Republic, and Myanmar (due to the aggregation of regions in GTAP we also include Timor-Leste together with Myanmar).

[9] In our simulation we include 18 of 21 countries negotiating FTAAP: Australia, Brunei Darussalam, Canada, Chile, Japan, Malaysia, Mexico, New Zealand, Peru, the United States, Vietnam, Singapore, Korea, Indonesia, the Philippines, Thailand, China, and Russia. We are not able to include Taiwan, China; Hong Kong SAR, China, and Papua New Guinea, as those are part of the rest of the word (ROW) in the model aggregation.

modifications based on analysis of the CPTPP text. NTMs for goods are constructed from the 2012 update of estimates by Kee et al. (2008) and the services barriers are based on estimates by Fontagné et al. (2011). Only three-quarters of measured barriers are considered as actual trade barriers, the rest is assumed to represent quality-increasing regulations (e.g., product safety standards). Further, only three-quarters of the remaining NTMs in the case of goods and one-half in the case of services are assumed to be actionable (i.e., politically feasible in a trade agreement), the rest is assumed to be beyond the reach of politically viable trade policies.[10] NTMs are modeled as iceberg trade cost. These are non-revenue generating costs, which allow for trade to expand if these costs are reduced. For example, if iceberg trade costs are equal to 0.9 for some transport node, that means that if 100 units leave port r, the destination port, r', receives only 90 units.

TPP-15 (CPTTP+)

Under this scenario TPP-11 is expanded to include Indonesia, the Philippines, Korea and Thailand in 2019. By comparing TPP-11 with TPP-15 we can evaluate the opportunity costs of Indonesia remaining outside of the agreement. In this simulation we use the same assumptions for the 11 CPTPP members as in the previous scenario. But in TPP-15 scenario the aforementioned assumptions about NTMs also hold for the new countries joining CPTPP. Tariffs in the four new CPTPP members are based on the GTAP values which are gradually reduced starting with a decline by 65% in 2019 up to 99% in 2028.

4. Macro-economic effects of PTAs

The results of the analysis suggest that of the PTAs under investigation, the EU-CEPA would yield the largest macro-economic gains for Indonesia in terms of income, output and exports, as illustrated in Figure 2 and Table 2. Relative to the business as usual baseline scenario, Indonesian GDP is expected to increase by 2.13% (or 54 billion USD) by 2030 as a result of the EU-IDN CEPA, compared to 0.18%, 0.58% and 0.89% in case of RCEP, TPP-15 and FTAAP, respectively.

The large impact of the EU-IDN CEPA is mainly driven by the mutual highest expected reductions in trade barriers (see e.g. Table 1 above for NTMs) and by the high share of international trade between the partners, as the EU accounts initially for 12% of total exports and 11% of total imports.

[10] The fraction of actual NTM reductions is derived for 21 separate issues areas, based on a score from 0 to 100 with a higher score indicating larger reductions in trade barriers by TPP compared with existing PTAs. See World Bank (2016a), p. 236 (Figure A.4.1.1).

Figure 2. Macroeconomic impact of potential PTAs on Indonesian economy by 2030 (percent deviations from the baseline)

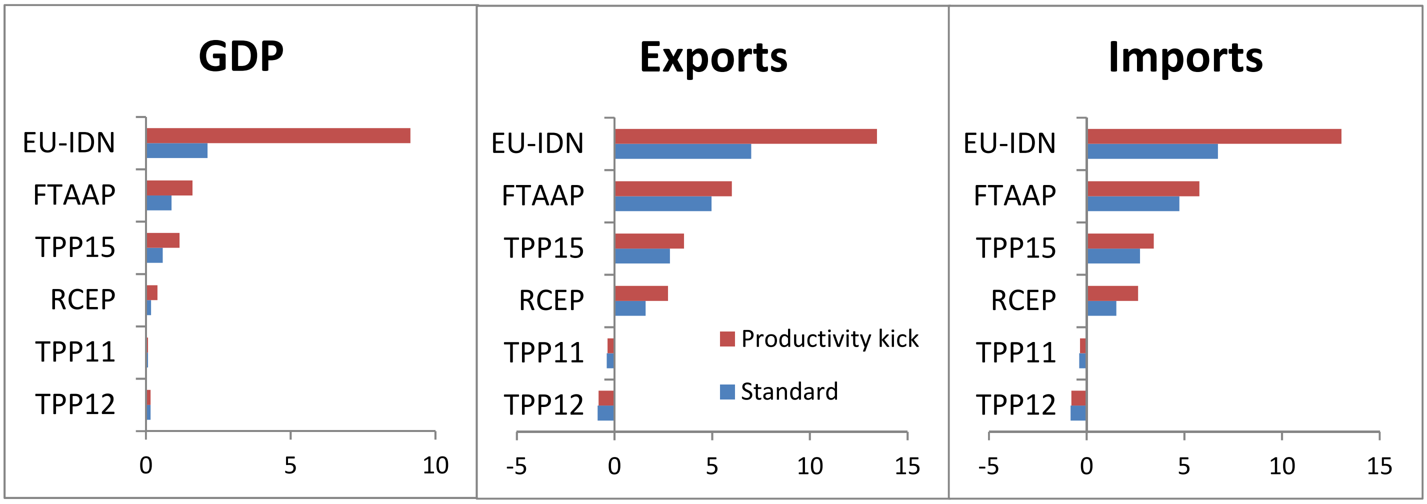


Table 2. Impact of potential PTAs on Indonesian economy by 2030 (percent deviations from the baseline).

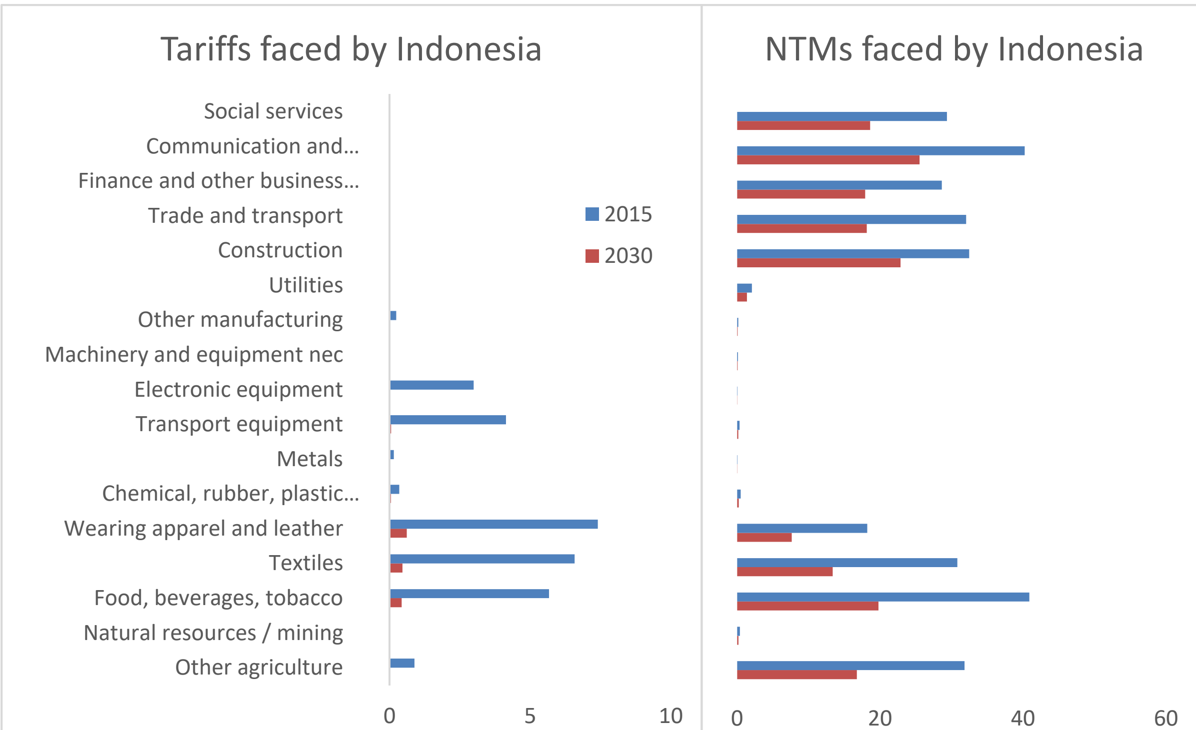
	Standard simulations						Simulations with productivity kick					
	RCEP	FTAAP	TPP11	TPP12	TPP15	EU-IDN	RCEP	FTAAP	TPP11	TPP12	TPP15	EU-IDN
GDP	0.18	0.89	0.07	0.16	0.58	2.13	0.40	1.61	0.07	0.17	1.16	9.14
Income	0.46	1.45	-0.09	-0.24	1.14	2.59	1.13	2.29	-0.06	-0.21	1.72	7.82
Exports	1.59	4.97	-0.40	-0.86	2.84	7.00	2.74	6.01	-0.36	-0.82	3.56	13.44
Imports	1.52	4.75	-0.38	-0.83	2.73	6.72	2.64	5.77	-0.34	-0.78	3.43	13.05

Indonesia faces relatively high protection in the EU markets.[11] While the estimated trade-weighted average tariff that Indonesia faces in the EU markets is close to zero (0.02%), the NTMs are the highest among all considered PTAs. In particular, the trade-weighted average NTM in trade with the EU equals 15.42% with the highest values in food processing (40.88%), communication and business services (40.23%), construction (32.47%), trade and transport (32.03%), agriculture (31.81%) and textiles (30.82%). Regarding tariffs, the highest ones are observed for wearing apparel (7.4%), textiles (6.58%), food processing (5.67%) and transport equipment (4.13%) – see Figure 3.

[11] All assumptions for the EU-Indonesia simulation are based on the EU-Vietnam FTA commitments suggested by Petri et. al. (2012).

In addition, Indonesian tariffs and NTMs are even higher for European goods and services. The trade-weighted average tariff in Indonesia is 3.38% while the average ad valorem equivalent of NTM equals 26.29% with the highest values in services ranging from 30.4% in social services up to 51.42% in communication and business services.

Figure 3. Trade barriers Indonesia faces on the EU markets, %



The substantial reduction in tariffs and non-tariff barriers leads to higher imports, which would expand by 6.72% relative to the baseline with total imports from the EU increasing by almost 90%. Total exports are expected to grow even more substantially than imports with a 7% growth rate compared to the baseline, while the EU becomes a much more important destination for Indonesian exports (the EU share in Indonesian export basket in 2030 increases from 9.8% in the baseline to 18.6%). At the same time, the share of non-EU countries in Indonesian exports declines by 8.8 percentage points (from 90.2% in the baseline to 81.4%).

Reduction of barriers could further deepen the country's specialization in manufacturing sectors (e.g., textiles, wearing apparel) by providing access to cheaper imported intermediates. The distributional effects – reported in more detail below – show that while capital remuneration increases only by 0.01 percentage points, unskilled and skilled labor gain the most (increase in wages by 0.08 and 0.06 percentage points compared to the baseline) due to labor-intensive production in expanding manufacturing and services sectors.

The largest gains of output and exports as a result of the EU-IDN CEPA are likely to occur in wearing apparel, textiles, food and beverages among good sectors. Services are among the largest beneficiary sectors from the agreement, including trade and transport, construction, financial and business services. In terms of growth rates, the production of textiles is projected to increase by almost 40% while exports expand by 68%. For apparel and footwear, the rise of output reaches 76%, while exports increase by 117%, mainly at the back of strong reduction in tariffs and NTMs in the EU. Given their small initial shares in the Indonesian economy (2% for textiles and 1% for apparel), the high growth rates of output and exports in these sectors do not translate into huge absolute increases. In particular, the absolute output gains in textiles and apparel sectors constitute about 55% of total gains, while the aforementioned services account for 33%.

This sectoral growth in production is partly fueled by a reallocation of production factors. Increased production in the liberalized sectors is projected to drive resources away from natural resources provision and manufacturing sectors such as chemicals, machinery and equipment, other manufacturing, transport equipment and metallurgy, reducing their output and exports.

The EU-IDN CEPA is projected to induce an increase of imports in all sectors, with the highest changes in services (trade and transport, financial services) as well as in textiles and wearing apparel (see Figures 4 and 5). Moreover, looking at the trade flows with the EU and non-EU countries, we observe a strong diversion of Indonesian exports away from non-EU countries, particularly for agricultural products (-36%) as well as for food and beverages (-7%).

The strong expansion of textiles and wearing apparel occurs not only due to the slashing of trade barriers, but also due to better access to intermediate inputs. Both sectors produce with a very high share of intermediate inputs: 70% in textiles and 63% in wearing apparel.[12] The trade agreement leads to an overall reduction of prices for products that are most important intermediates in those sectors, namely wearing apparel, textiles and trade and transport services (approximately by 2 percentage points in textiles and wearing apparel, and by almost 1 percentage point in trade and transport services compared to the baseline). Imports of textiles and wearing apparel increase strongly as a large share is used as intermediate input.[13] Despite this increase in imports, the import intensity of output declines in textiles (-2 percentage points) and wearing apparel (-2.9 percentage points) as the domestic supply of these intermediates increases faster.

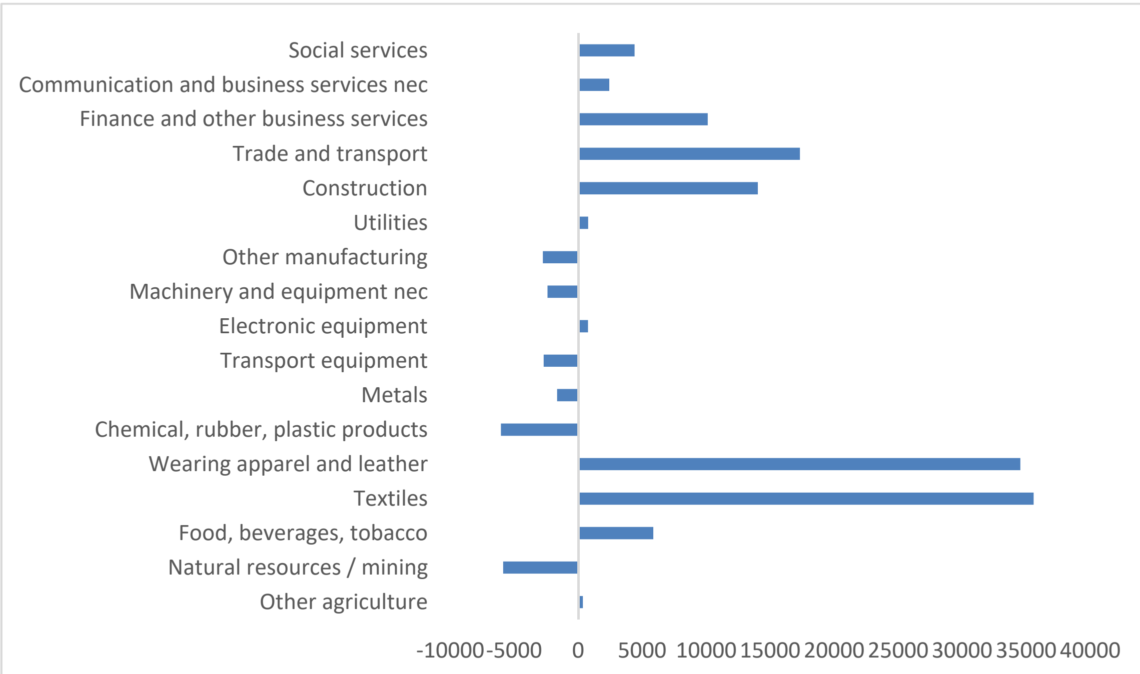
Trade and transport services also expand mainly due to a higher demand by all other sectors which use these services as an input to production. For example, these services account for up to 28% of all intermediate inputs in transport equipment and social services. Moreover, the initial share of domestically supplied trade and transport services in intermediate inputs of other sectors exceeds

[12] The majority of intermediate inputs in textiles consist of textile products (65%) and trade and transport services (11%). In wearing apparel production, textile products constitute 29% of all intermediate inputs, while wearing apparel products amount to 17% and trade and transport services - to 13%.

[13] The initial overall share of all imported intermediate inputs in textiles exceeds 25%, while in wearing apparel it is over 17%. Going deeper we can also see that initially over 36% of all textile products used as intermediates in textiles are imported, while in wearing apparel almost 30% of textile products, 23% of wearing apparel and 15% of trade and transport services used as intermediate inputs are imported.

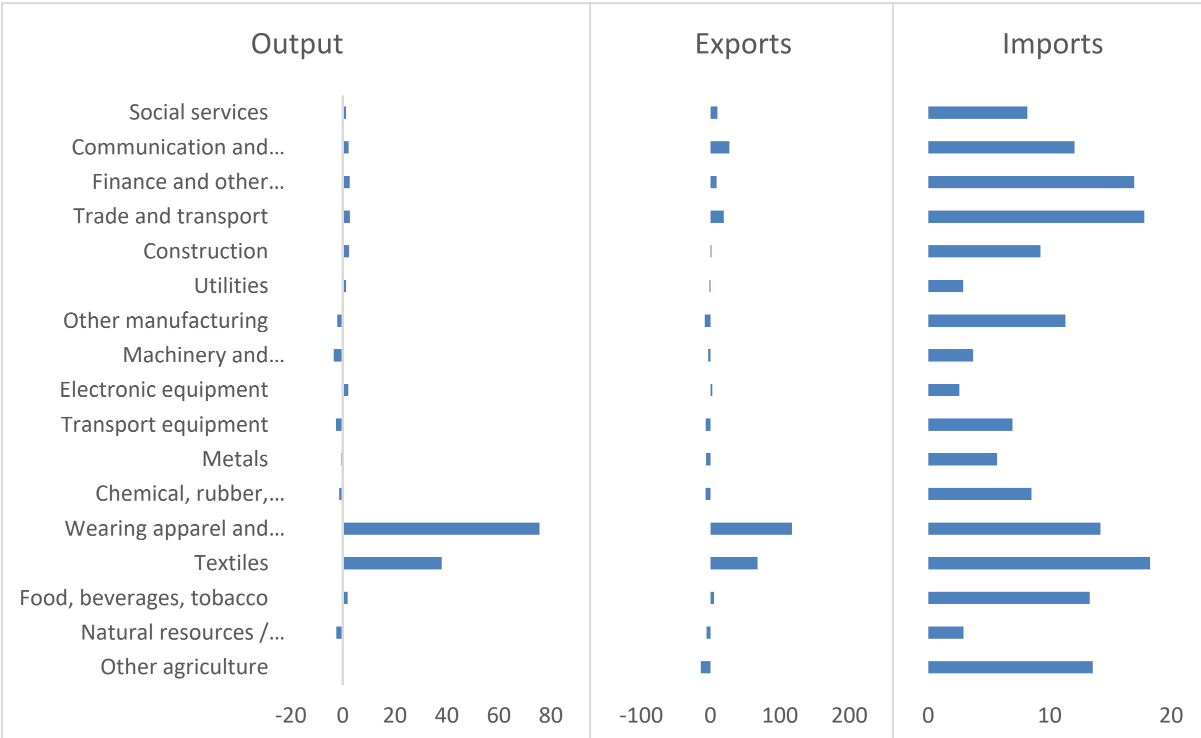
80% in all sectors except for natural resources provision. Communications and business services are among the services sectors that benefit the most from cheaper intermediates as the initial share of imported intermediate inputs is above 23%.[14]

Figure 4. Output changes, EU-Indonesia FTA (USD)



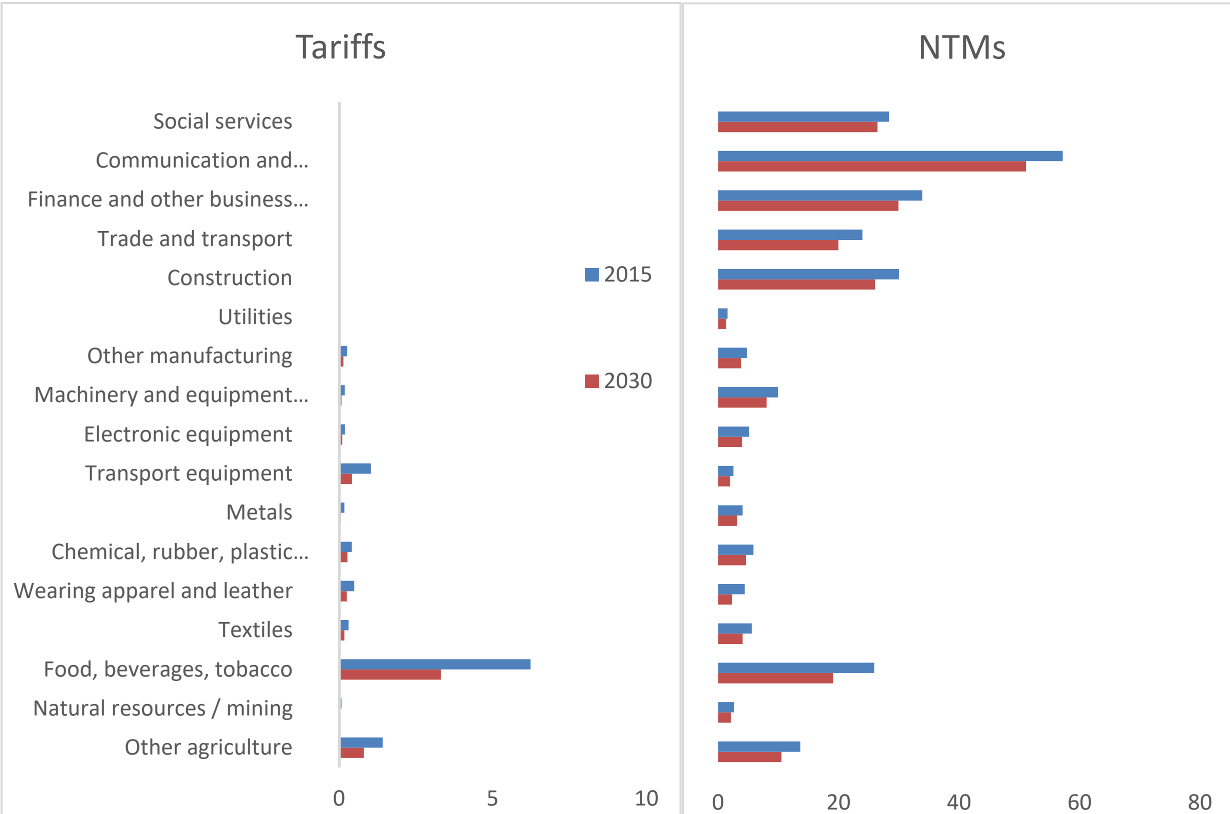
[14] The bulk of these intermediate services is composed of trade and transport services, communications and business services, and social services.

Figure 5. Sectoral results, % relative to the baseline in 2030 (EU-Indonesia FTA)



At the other end of the spectrum, the small expected impact of RCEP is driven by already low levels of protection among the member countries. Due to the economic integration within the Association of Southeast Asian Nations (ASEAN) and with further countries (e.g., PTAs between ASEAN and China, Japan, Australia, New Zealand, India, Korea, as well as Japan-Indonesia CEPA), the trade-weighted average tariffs that Indonesia faces in other RCEP members range from zero in Singapore up to 5% in India. The Indonesian trade-weighted average import tariff vis-à-vis other RCEP members is also very low at 0.3%. The highest average import tariffs on Indonesian products occur in food processing (6.23%), agriculture (1.41%) and transport equipment (1.03%). NTMs levels are also small. The trade-weighted average value in other RCEP countries amounts to 7.10% while the Indonesian average (ad valorem equivalent) NTM is the lowest among the agreements considered here, with a value of 3.02%. Although the trade-weighted averages are quite small, NTMs faced by Indonesia in RCEP countries are very high in certain sectors. The highest barriers occur in services such as communication (57.19%), finance and other business services (33.89%), construction (30%), social services (28.38%), trade and transport (23.95%) as well as in food processing (25.93%) and agriculture (13.65%) (Figure 6).

Figure 6. Trade barriers Indonesia faces on the RCEP markets, %

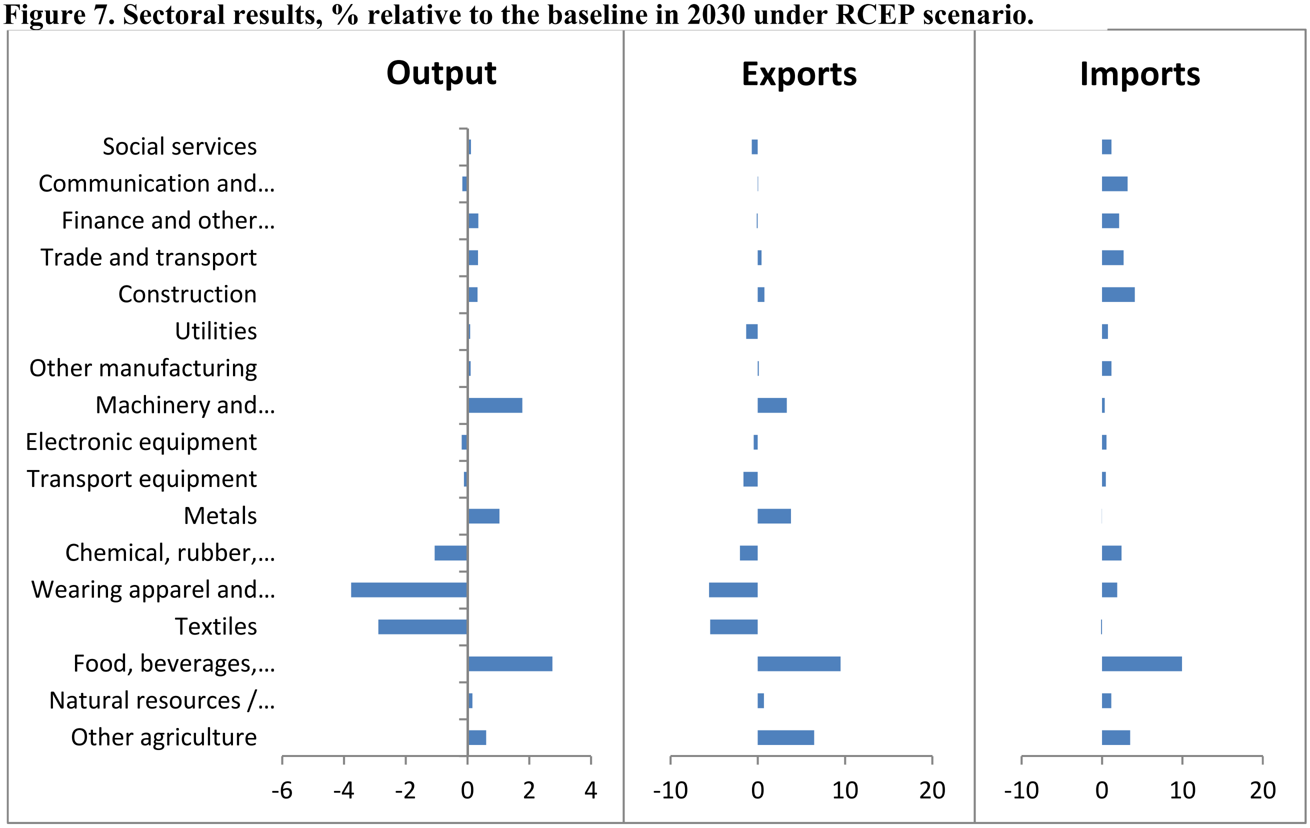


As a result of the low initial level of protection and the assumed less ambitious level of commitments for RCEP vis-à-vis the other agreements, the expected reduction of tariffs and NTMs is relatively small. The highest reduction in the trade-weighted import tariff is expected in India (2.9 percentage points) and China (1.6 percentage points) while the average NTM that Indonesia faces on the RCEP markets falls only by 1.64 percentage points. As illustrated in Figure 6, the highest reduction of trade barriers should occur in services sectors (communication, finance and other business services, construction, trade and transport) as well as in food processing, agriculture, wearing apparel and textiles.

Although the reduction of trade barriers is quite low, RCEP agreement enables a better access to a large number of growing markets and therefore some increase in participation in global value chains. Economic integration with 16 countries of the region induces a boost of Indonesian income by almost 10 billion USD, a GDP increase of 0.18% by 2030 compared to the baseline. Reduction of trade barriers leads to higher exports and imports, which expand by over 1.5% relative to the baseline. However, the agreement induces also some trade diversion with a reduction of Indonesian exports to non-member countries by 2.5%.

The largest expansion of output and exports as a result of relatively high reduction of trade barriers between the RCEP members are expected to occur in food and beverages, machinery and equipment, metals, agriculture as well as in several services sectors like trade and transport, construction, financial and business services (see Figure 7).[15] Output of food products and beverages increases by 2.8% while its exports expand by 9.5% compared to the baseline. The production and exports of other machinery and equipment grow by 1.8% and 3.3%, respectively. Given that those sectors produce with an intensive use of labor, skilled and unskilled workers gain the most among production sectors. However, reallocation of resources to the liberalized sectors and comparative disadvantage of Indonesia in RCEP markets in wearing apparel, textiles, chemicals, transport and electronic equipment lead to lower output and exports in these sectors. Reduction of Indonesian trade barriers is also projected to induce an increase of imports in all sectors (except textiles), with the highest changes in food processing and agriculture, as well as in services (see Figure 7).

Figure 7. Sectoral results, % relative to the baseline in 2030 under RCEP scenario.



[15] Exports of services decline together with an increase of imports. This happens due to higher domestic demand for services which are often used as intermediate inputs and can be used at a lower price after trade liberalization.

The two strongly expanding sectors – food processing and machinery and equipment – benefit from better access to cheaper intermediates after the trade agreement as their share of intermediate inputs amounts to 68% and 63%, respectively. In particular, the initial share of imported food and agricultural products used as intermediate input in food processing accounts for over 17% which also explains a strong increase of imports in these sectors. Moreover, import intensity of output slightly increases in food processing (0.4 percentage points) indicating an increased demand for imported intermediates. Other machinery and equipment has initially the highest overall share of imported intermediates across all sectors (65%) and benefits from better access to e.g. metal (16% of all intermediate inputs) and chemical products (13% of intermediate inputs). Due to the lower import intensity of output in machinery and equipment (-1.9 percentage points), domestic supply of intermediate machinery products increases to provide 33% of all intermediate inputs in this sector. As for services, the output and imports of trade and transport services expand due to the expansion in the production of other sectors which utilize these services as inputs. For instance, these services constitute over 20% of total intermediate inputs in food processing and other machinery and equipment.

In comparison to the EU-IDN CEPA and RCEP, the implementation of the CPTPP (TPP-11) would have negligible impact on Indonesia as the country does not take part into the agreement**.** The expected impact on real GDP and income is negligible (see Figure 2 and Table 2), while in fact exports and imports contract slightly due to the trade diversion away from Indonesia to the CPTPP members (e.g., Indonesian exports to the TPP-11 members contract by almost 3%). A similar picture would arise in case of TPP including the United States (TPP-12), with an even stronger fall of total trade flows.

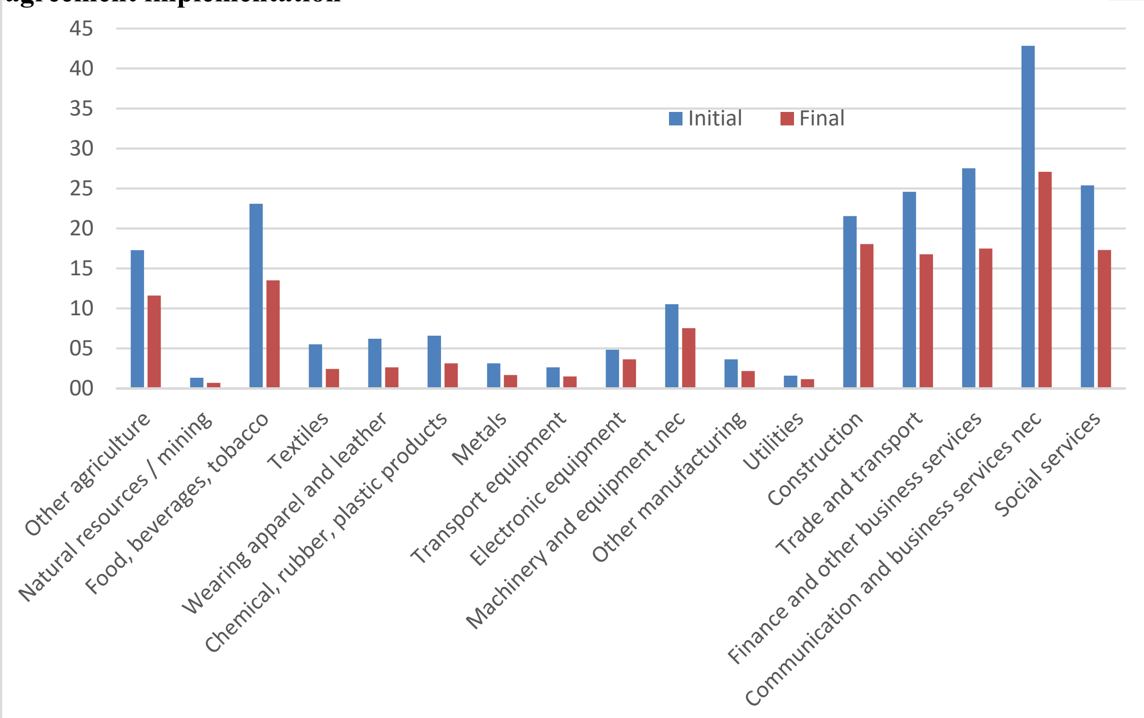
On the other hand, joining an expanded CPTPP (TPP-15) along with Korea and Thailand would increase Indonesian GDP by 0.58%. Reduction of trade barriers leads to higher exports and imports, which expand by over 2% relative to the baseline while exports to the TPP-15 members increase by almost 14%.

The estimated trade weighted average tariff that Indonesia faces in TPP-15 markets is close to zero. Only wearing apparel and leather products face a quite high tariff of 5.9% (see Figure 8). In contrast, the trade-weighted average NTM in TPP-15 markets is equal to 5.53% (see Table 1) while country-specific values range from 3% in Chile up to 16% in the Philippines. The highest barriers have been estimated in communication and business services, financial and business services, trade and transport services, social services and construction (see Figure 8).

Joining the TPP-15 is likely to significantly reduce NTMs faced by Indonesia. On the basis of the original TPP commitments, Petri and Plummer (2016) estimate a potential average reduction of ad valorem equivalent of NTMs of 3.26% (see Table 1). In particular, a strong decline of NTMs is observed for Indonesian food products in Peru of 31 percentage points; in services for communication and business services in Mexico (39 percentage points) as well as for construction in the case of Peru (36 percentage points). The trade weighted ad valorem equivalent of NTMs across sectors are the highest in communication and business services (15.74 percentage points), finance and other business services (10.05 percentage points), trade and transport services (7.83 percentage points), and food processing (9.58 percentage points) (Figure 8).

On the sectoral level, trade liberalization between the TPP-15 members leads to a strong increase of output and exports in sectors such as transport equipment (10.3% and 30.9%), wearing apparel and leather (8.5% and 13.2%), as well as machinery and equipment (6.28% and 13.30, respectively). For services, we observe a slight increase of output (under 1%),[16] that comes together with increased imports and even reduced exports in case of construction, finance and other business services. This illustrates the increased demand for services as inputs for production. The losing sectors that contract their production include only natural resources, food processing and agriculture.

Figure 8. Trade-weighted NTMs faced by Indonesia on TPP markets before and after agreement implementation



Compared to the TPP-15 scenario, the benefits for Indonesia would be even higher in case of FTAAP implementation, which spans a wider regional membership (Figure 1 above). Enlarging the TPP-15 into FTAAP would increase the GDP gain from 0.58% to 0.89% and raise exports and imports by 4.97% and 4.75% compared to the baseline, respectively (Figure 2 and Table 2). Indonesian exports to the FTAAP member countries would increase by almost 12%, while some

[16] Except for communication and business services, where output remains almost unchanged while imports increase the strongest among all services sectors.

trade diversion away from non-member states is expected with a fall of exports by 4.2%. In general, the share of non-member countries in Indonesian exports drops from 41.9% to 38.2%, while the one of FTAAP members increases by 3.7 percentage points (from 58.1% to 61.8%).

These higher benefits of FTAAP are due to improved access to a higher number of markets that account for 56% of global output and over one third of world trade, while its share of intra-RTA trade amounts to 65% of members' total trade (World Bank, 2016a). Moreover, the FTAAP agreement is associated with a lower degree of liberalization of tariffs and NTMs as compared to the TPP, so the potential reductions in trade barriers are higher. In particular, the trade weighted average NTM that Indonesia faces on the FTAAP markets drops by 3.3 percentage points from 6.7% to 3.4%. The Indonesian trade weighted NTM also falls from 4.26% to 2.5% (Table 1). Regarding tariffs, they also decline, even though with a lower magnitude: the trade weighted average tariff that Indonesia faces on the FTAAP markets falls from 1% to 0.1%, while the Indonesian average tariff against other FTAAP countries declines from 0.7% to 0.15%. On the sectoral level, the highest initial tariffs that Indonesia faces on the FTAAP markets is in wearing apparel (11.3%) and textiles (5.2%), while for NTMs the highest values occur in communication and business services (47.2%), construction (42.1%), financial (33.1%), as well as trade and transport services (28.3%). Given the relatively high initial trade barriers in textiles and apparel, these sectors expand their output and exports the most. The increase in production of wearing apparel equals to 21.4%, while its exports rise by 33.1%. For textiles, the respective values are 17.9% and 37.2%. Among the biggest losers, we find the same sectors as in case of TPP-15, namely food processing and agriculture, which reduce their production by 2.2% and 1%.

Export diversion by destination and sector

While aggregate gains in output and trade volumes are important to define the extent of benefits that would come to realization after the implementation of PTAs; changes in the composition and direction of trade are, in contrast, major determinants on the sectoral composition of those gains. Quantifying the extent of gains and losses across and within countries is crucial to define policy-options that compensate losers, and hence reduce resistance and move negotiation agendas in favor of more ambitious and beneficial agreements.

In case of Indonesia and the PTAs analyzed in this paper, the larger aggregate gains would come from the implementation of the EU-IDN, FTAAP, and TPP-15 agreements, depicted in Figure 9 below. As expected, the share of Indonesian exports directed to the European continent would increase from 9.7 percent of total exports in the baseline, to 18.5 percent in the EU-Indonesia FTA; or from \$48 billion to \$98 billion in exports in 2030. FTAAP, in contrast, redirects exports to the United States, \$19 billion more in exports with respect to the baseline, or a shift from 8.7 to 12 percent of total exports. TPP-15 would encourage exports to countries that are part of the TPP-block excluding the United States (Canada, Mexico, Chile, Peru) increasing their export volume in 2030 by $10 billion or increasing from 1.4 to 3.3 percent of total exports.

Figure 9. Destination of Indonesian exports in selected scenarios, 2030

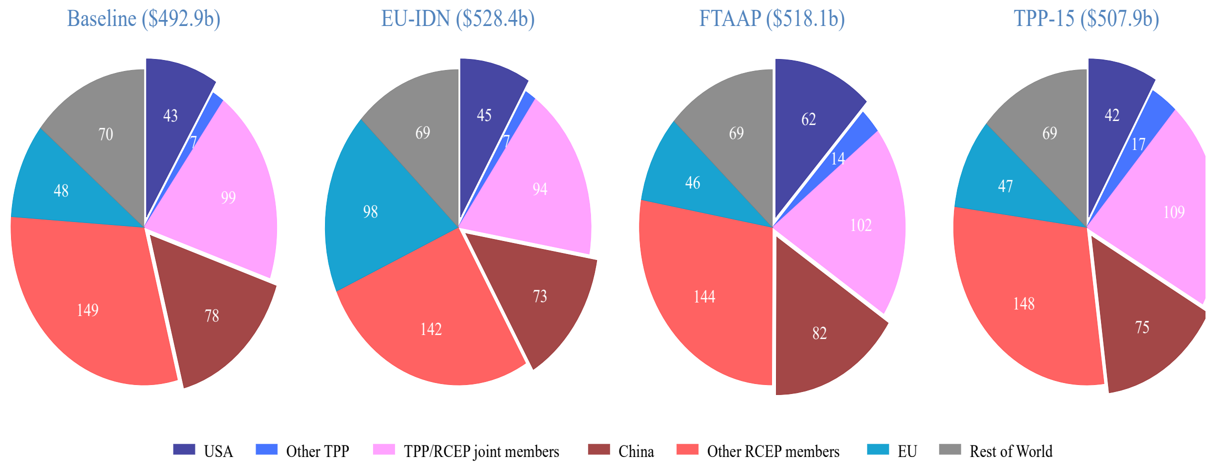
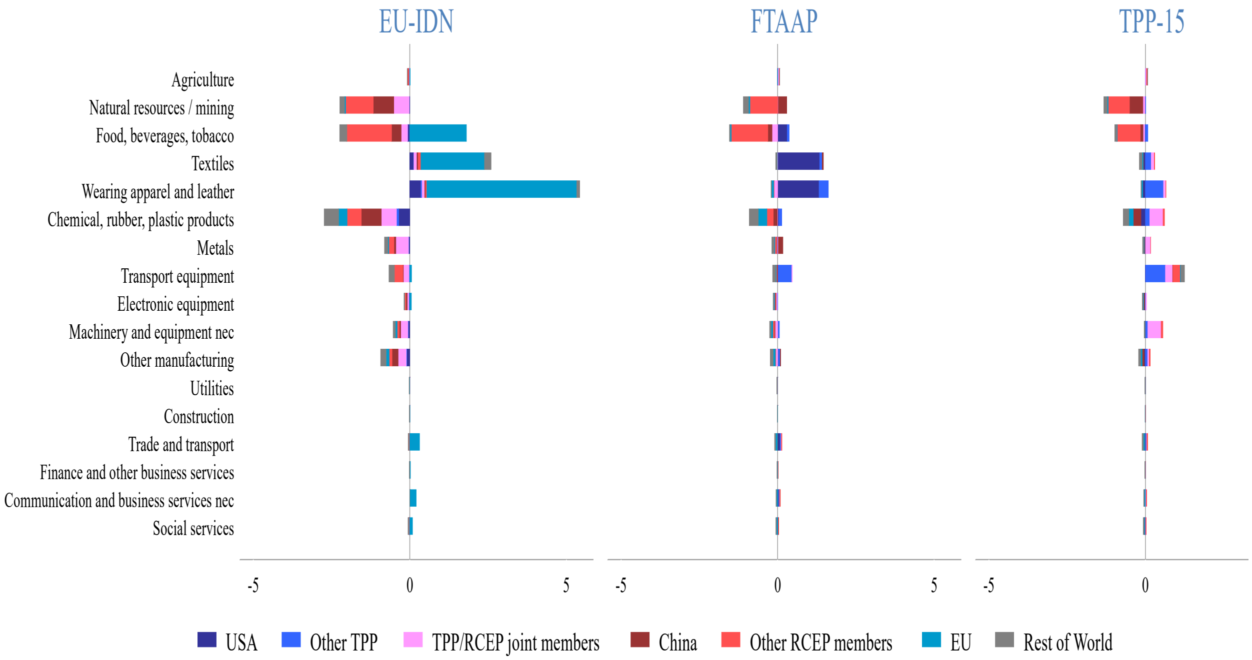


Figure 10 expands on trade diversion under these PTAs by showcasing the sectoral decomposition of exports with respect to baseline in 2030. Percentage point changes of exports by sectors are shown in horizontal bars, the sum of which is equal to zero. It can be seen that most of the sectoral reallocation would shift exports towards wearing apparel, textiles, and to a lesser extent into food, beverages, and tobacco under the EU-IDN CEPA and FTAAP. The former scenario would lead to redirection of exports to the European Union while the latter to the United States. By contrast, TPP-15 offers a more balanced distribution favoring sectoral growth in sectors typically associated with larger value added, such as transport and machinery equipment. Export destinations for these growing sectors would be located within the TPP-RCEP block, excluding the United States, the European Union, and China.

Figure 10. Sectoral decomposition of exports in 2030
(percentage point differences with respect to baseline)



Productivity kick

The results described above do not incorporate gains in productivity due to trade liberalization and increased openness as the analysis only captures the reallocation of production to the most efficient sectors. However, several studies (e.g., Topalova, 2004; Amiti and Konings, 2007; Yu, 2015) show that lower import tariffs for final goods increase firms' productivity by inducing tougher import competition, while cheaper intermediates can improve productivity via learning, variety and quality effects. In particular, Amiti and Konings (2007) find that a 10 percentage point fall in input tariffs leads to a productivity gain of 12 percent for Indonesian manufacturing firms that import their inputs. For Chinese manufacturing firms, Yu (2015) illustrates that a 10 percentage point fall in output (input) tariffs leads to a productivity gain of 9.2% (5.1%). Moreover, the author concludes that import trade liberalization contributes at least 14.5% to economy-wide productivity growth in China.

To illustrate an upper bound of the possible gains from different PTAs, we run the same scenarios with additional productivity gains based on trade-weighted average reduction of tariffs over the FTA members under each scenario (see Table 3 for details). In particular, we follow one of the most conservative empirical estimates of such productivity kick (Topalova, 2004) and assume that a 10% decrease in protection leads to a 0.5 percentage points productivity gain. Table 3 illustrates the calculated trade weighted average reduction of tariffs and corresponding productivity gains in Indonesia for all simulations.

Assuming this productivity kick greatly enhances the positive economic impacts of all of the PTAs (see Figure 2 and Table 2 above). Compared to the standard setup, GDP increase is boosted by 0.22 percentage points in the case of RCEP and up to 7 percentage points in the case of EU-Indonesia FTA. Due to the highest reduction in trade-weighted average tariff in the case of the EU-IDN CEPA (see Table 3), the productivity kick is the highest among all the simulations which leads to the strong increase of gains with the trade flows expanding by more than 13%.

Table 3: Assumptions on productivity increase from import cost reductions in Indonesia

	Aggregate tariff reduction in Indonesia, percentage points	Productivity kick, percent
TPP-15	0.39	0.12
RCEP	0.12	0.04
FTAAP	0.50	0.15
EU-IDN	3.19	0.96

5. Distributional impacts of the PTAs

Next we translate these macro-economic effects into distributional effects using the GIDD micro-simulation model. The key macro-micro results are reported in Table A2 in Annex 2. We first simulate the evolution of the distribution of income up to 2030 to create the baseline and then compare the results of the PTAs to this baseline.

Extreme poverty in Indonesia has steadily declined since the mid-1980s. The percentage of people living with less than PPP$1.90 a day fell from 70.3% in 1984 to 9.3% by 2013.[17] During this period, Indonesia successfully managed to keep the long-term pace of poverty reduction vis-à-vis other developing countries. Recent data show that Indonesia's poverty rate was, nonetheless, 5.8

[17] Data from PovcalNet http://iresearch.worldbank.org/PovcalNet/povDuplicateWB.aspx# Poverty headcount ratio at PPP$1.90 a day in 2014 is 8.3 percent.

percentage points above the East Asia & the Pacific regional average and 7.2 points above the poverty level of upper-middle income countries.

It is projected that close to 39 million will be lifted from poverty by 2030. Under baseline, historical trends on poverty reduction and shared prosperity are projected to continue. Household consumption per capita, the main driver of poverty reduction, would grow at 3.9% per annum. The headcount ratio (%) of extreme poverty using a poverty line adequate for countries with lower-middle income status, at $3.20 a day, is projected to decline from 31.4% in 2016 to 14.5% by 2030.[18] This represents a decline from 81.9 million in 2016 to 43 million living in poverty by 2030. In a similar fashion, poverty using a higher poverty line of PPP$5.50 a day, adequate for countries in upper-middle income status, would decline from 62.8% to 40%; or from 163.6 million to 118.1 million by 2030 (Figure 12a).

Growth in household consumption is expected not to be equally shared by all segments of the population. The macro-micro simulation framework captures dynamic changes in the distribution of income through a series of simulation steps, which include (a) demographic and educational composition of the population, (b) sectoral reallocation of labor, (c) movements in skill-premia and (d) changes in relative prices of consumption goods.

For the baseline, each one of these effects is decomposed in Figure 11 below. With respect to (a) demographic and educational change, modest regressive changes to the distribution of income are generated from the projected expansion of the supply of skilled labor. As expected, intra-group inequality is higher for skilled labor and this group is projected to increase its share in total employment from 36.8% in 2015 to 42.3% by 2030 (Figure 12b). The sectoral reallocation of labor (step (b)) helps offset the regressive effects of step (a) by allowing labor to move away from the low-wage and shrinking agricultural sector to the expanding non-agricultural sectors of the economy. Step (c) modifies skilled wage premia by sector in line with general equilibrium conditions. This step typically generates strong regressive effects in the baseline as the overall structure of the economy shifts away from agriculture towards skill-intensive manufacturing and services as a result of a rapid capital expansion. This shift in the economic structure determines a relative increase in the demand for both skilled labor and capital. Lastly, (d) the effect of consumption prices is slightly regressive considering that under baseline conditions the inflation of non-food items is slower than that of food prices, resulting from general-equilibrium conditions. The combined effect of these mechanisms is regressive under baseline conditions, making the ratio

[18] Global extreme poverty has been measured using an absolute poverty line, currently at PPP (2011) $1.90/day. While this absolute poverty line is adequate for the majority of low-income countries, more adequate definitions are needed to measure the evolution of poverty in middle- and high-income countries. As a matter of fact, as countries reach higher levels of per capita income they either increase the minimum threshold level for poverty or adopt relative poverty lines (Ravallion and Chen (2011)). The World Bank has released a set of additional poverty lines at PPP$3.20 a day for lower-middle income and at PPP$5.50 a day for upper-middle income countries. In the forward-looking context of this paper and considering that Indonesia would reach upper-middle income status under business as usual conditions, we monitor the extent of poverty using these two alternative poverty lines.

of average income of the top-60 to the bottom-40 percent increase from 3.7 to 4.0 percent (Figure 12c) and the Gini coefficient to increase from 40.6 to 44.2 (Figure 12d).

Figure 11. Growth incidence curve after each simulation step under baseline conditions, by 2030

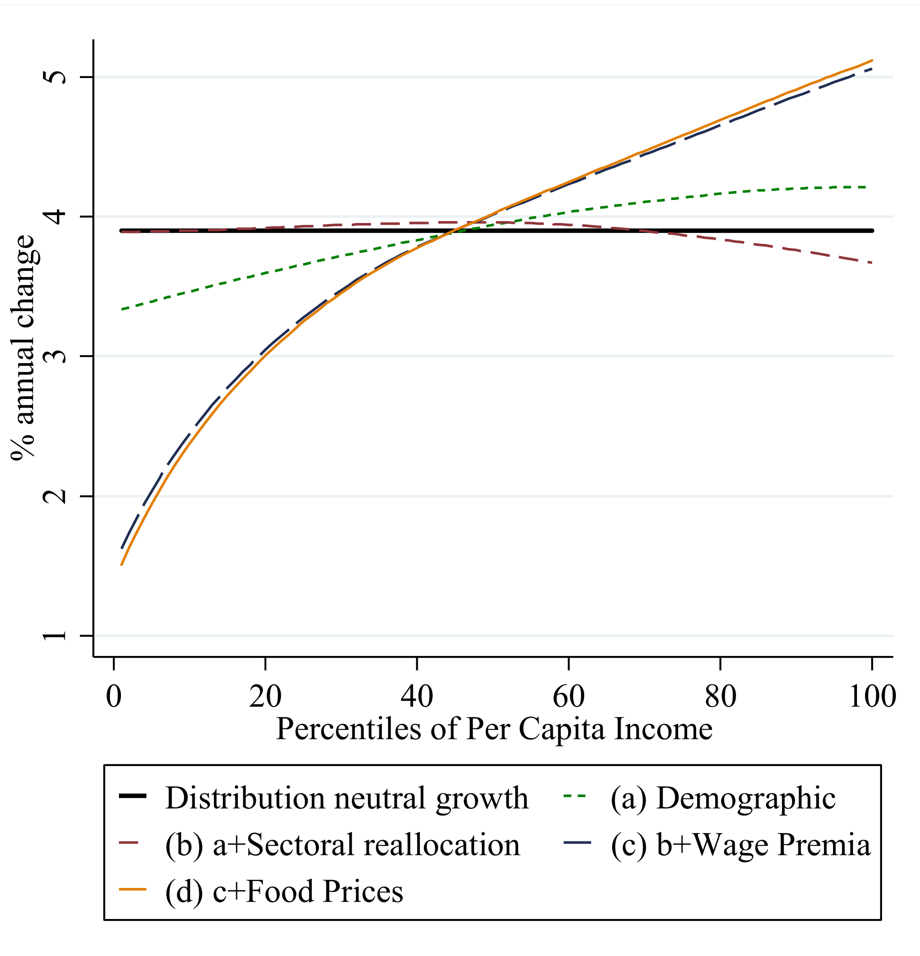
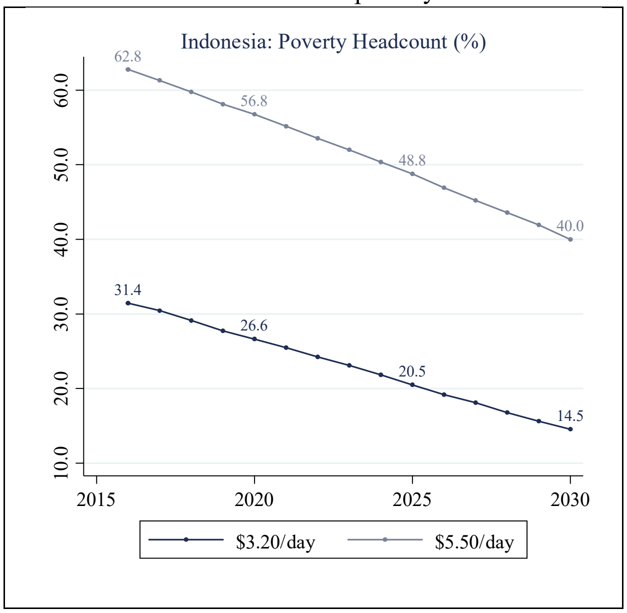
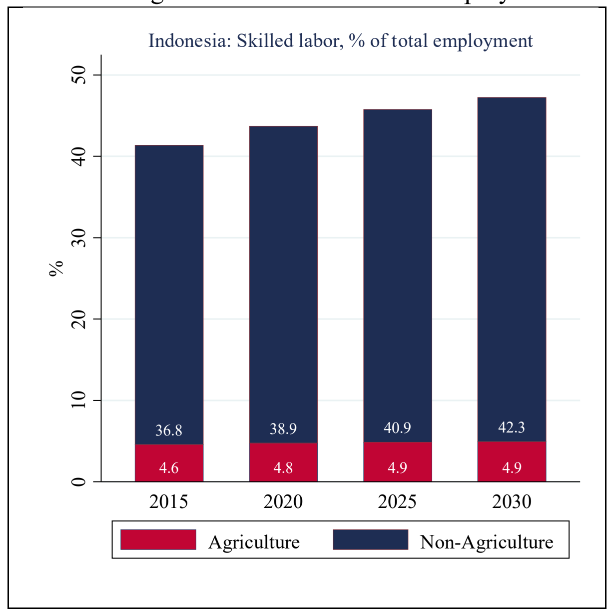


Figure 12. Poverty headcount and shared prosperity in Indonesia in the baseline scenario 2015-2030

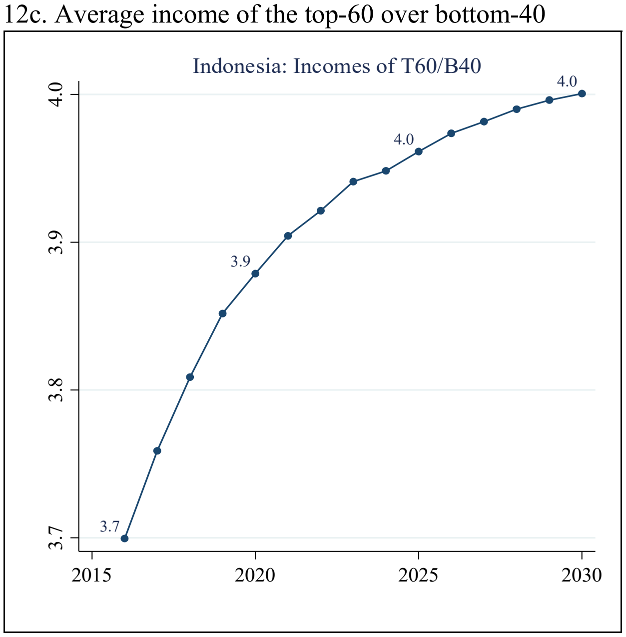
12a. Headcount ratio of extreme poverty



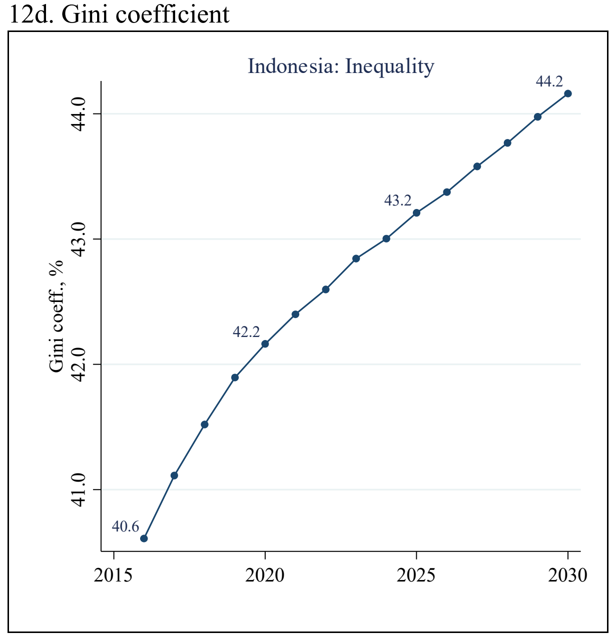
12b. Percentage of skilled labor to total employment



12c. Average income of the top-60 over bottom-40



12d. Gini coefficient

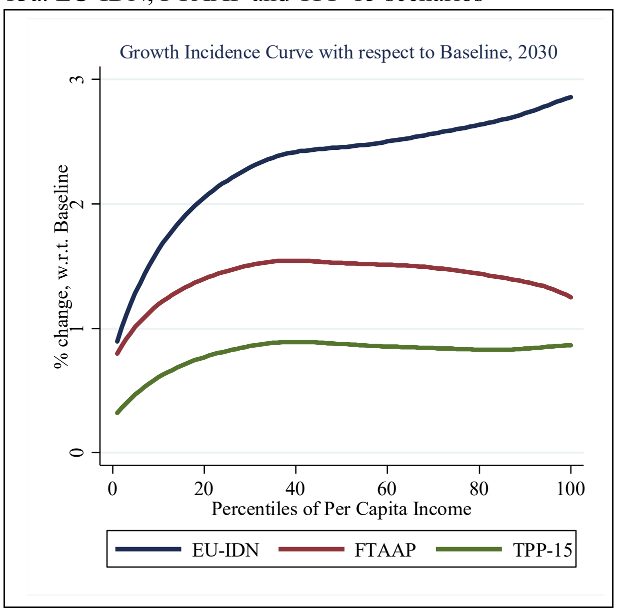


The EU-IDN, FTAAP, and TPP-15 scenarios all lead to further poverty reduction, but also to increased inequality. Figure 13a shows the growth incidence curves for each one of these three scenarios and Figure 14a shows their effects on poverty reduction. The relative size of the macro-economic effects of the different PTAs is in line with that of both overall growth and poverty reduction. The EU-IDN CEPA yield the largest poverty reduction effect for a line of PPP$5.50 a day with 3.3 million lifted above the poverty line, followed by the FTAAP (2.1 million) and TPP-15 (1.3 million). At the same time, the shape of the growth incidence curve also suggest that more ambitious agreements tend to concentrate larger gains in richer segments of the population, particularly in the case of the most ambitious of all, i.e. the EU-IDN CEPA (Figure 13a).

In contrast, RCEP and CPTPP (TPP-11) scenarios offer lower gains in terms of poverty reduction but better distributional outcomes. The RCEP scenario generates a reduction in poor people by 0.3 million for the PPP$3.20 a day line and by 0.8 million for the PPP$3.20 a day line **(**Figure 14b). The growth incidence curve (Figure 13b) shows that CPTPP might have a negative impact on the middle-class, sending more people - 0.3 million -below the poverty at the PPP$5.50 a day.

Figure 13. Growth incidence curves in simulated scenarios in 2030.

13a. EU-IDN, FTAAP and TPP-15 scenarios



13b. RCEP and CPTPP scenarios

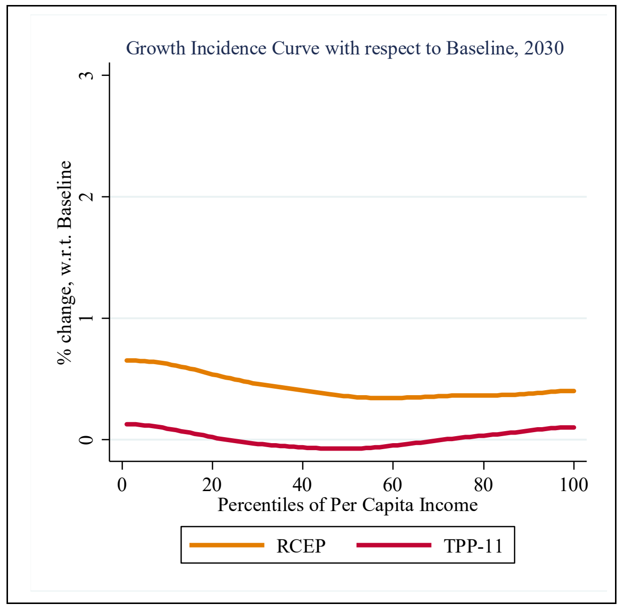
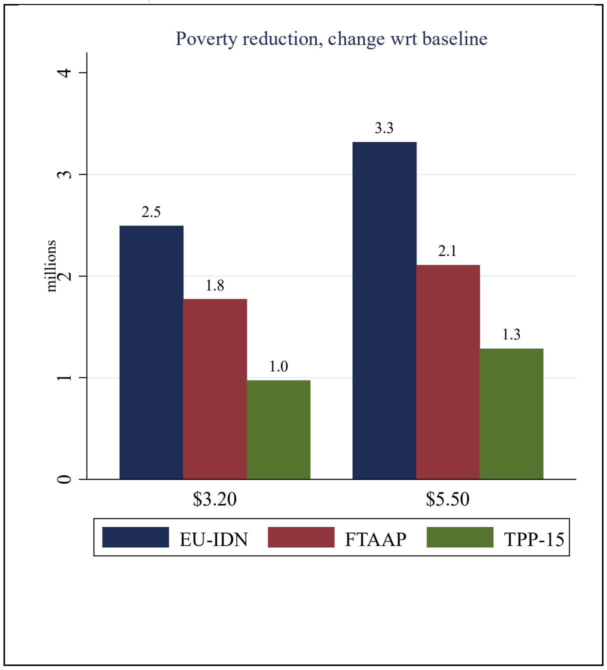
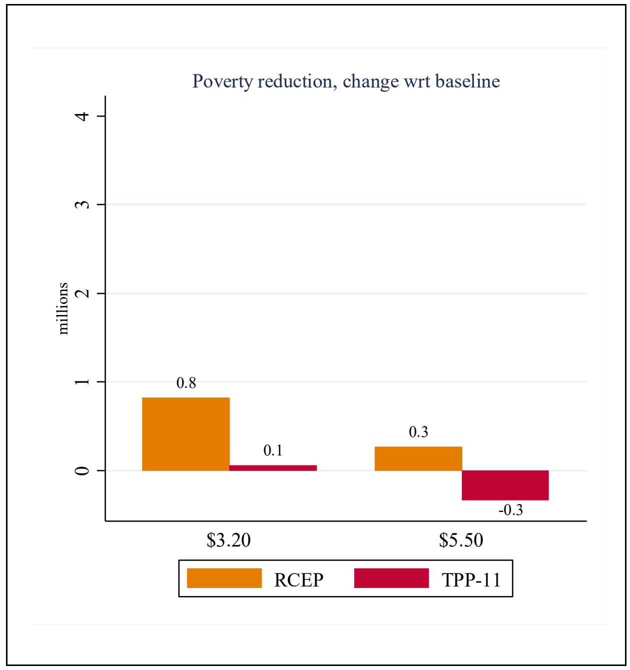


Figure 14. Poverty reduction in simulated scenarios by 2030.

14a. EU-IDN, FTAAP and TPP-15 scenarios



14b. RCEP and TPP-11 scenarios

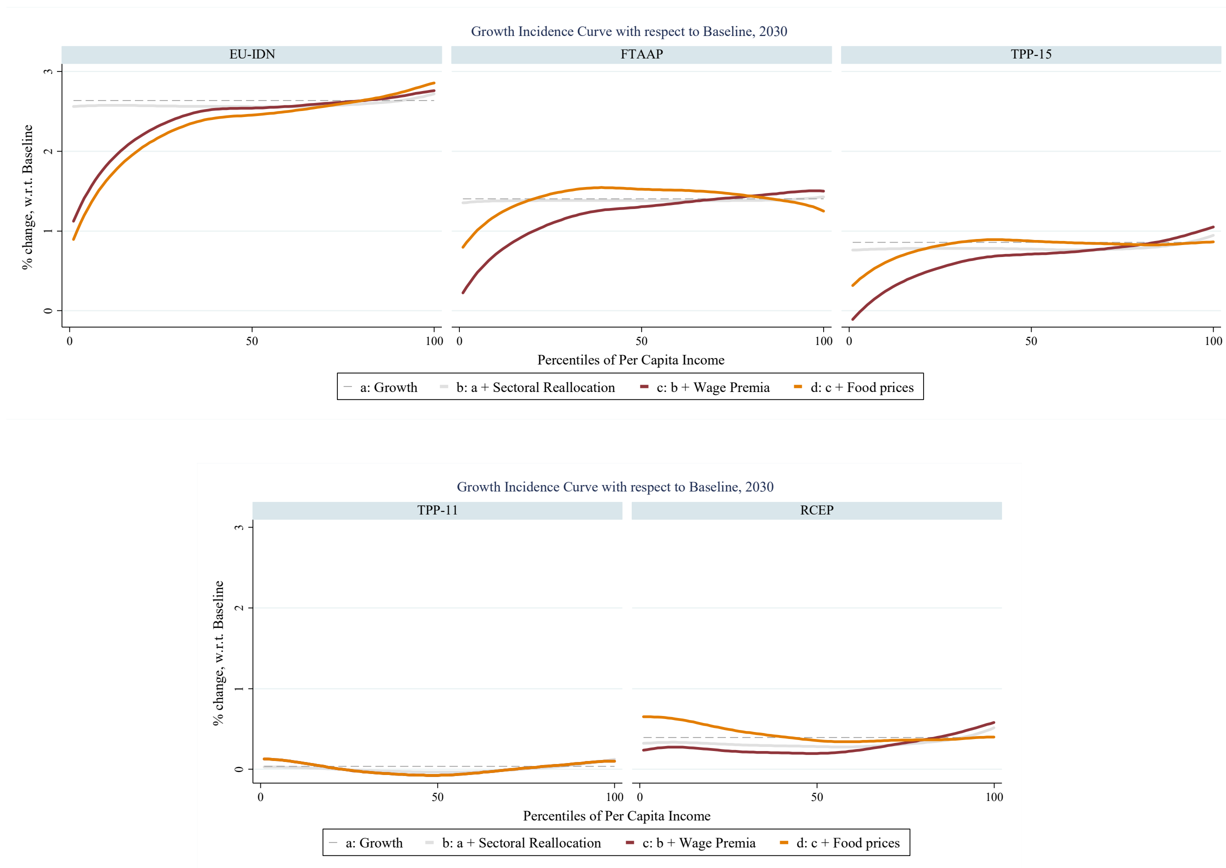


Incidence curves in Figure 15 below depict deviations from baseline conditions that result from each additional simulation step, by scenario. The larger net effects are caused by growth. Indeed, the EU-IDN CEPA yields the highest expected growth of income relative to the other PTAs at every point of the income distribution. The distributional effects are relatively smaller, considering that at most they account for around 1.75 percent deviations in per capita household consumption from baseline conditions, after growth. In all cases, sectoral reallocation of labor contributes only marginally to changes in the income distribution. This follows from the assumption of fixed labor, for instance PTAs are assumed not to change the willingness of people to join the labor force.

The size of the gains grows monotonically with income for the EU-IDN CEPA while the growth incidence curve has a U-shape in the case of RCEP, and a mildly inverted U-shape for the other agreements. The regressive nature of the EU-IDN CEPA is mainly due to the increase in skill wage premia spurred by the additional demand for skill intensive sectors, services in particular. Changes in wage premia are more pronounced when the effect of growth is larger, such as in the EU-IDN FTA and the FTAAP. On the other hand, the progressive effect of food prices tends to dominate in the case of RCEP, thus determining the progressive nature of the gains in the RCEP scenario.[19]

[19] Note that the food price channel is always progressive except in the EU-IDN CEPA where it is slightly regressive.

Figure 15. Incidence curves with respect to baseline, by 2030



6. Conclusions

With the flurry of new, more complex bilateral and regional PTAs, it is become more important to carefully assess their economic impacts. This paper has provided macro- and micro-estimates of the impacts of various important agreements currently negotiated or potentially negotiated by the largest economy in Southeast Asia – Indonesia. To that end, it has employed state-of-the-art simulation methods, including a dynamic multi-country global CGE model and a micro-simulation tool linking the macro-economic results to the household level.

The results suggest that of the PTAs under investigation, the EU- CEPA would yield the largest macro-economic gains for Indonesia in terms of income, output and exports. This large impact is mainly driven by the high expected reductions in trade barriers and the high share of international trade between Indonesia and the EU. Indonesia would gain substantially also if it decides to join the CPTPP and the FTAAP due to the size of the markets and the ambition of the commitments. On the other hand, RCEP is expected to yield lower gains as members have already achieved a relatively high degree of liberalization among themselves and there is little prospect to significantly advance that level.

These macro effects translate into commensurate reductions of poverty. The EU-IDN CEPA yields the highest expected growth of income relative to the other PTAs at every point of the income distribution. However, the size of the gains grows monotonically with income for the EU-IDN CEPA while the growth incidence curve has a U-shape in the case of RCEP, and a mildly inverted U-shape for the other agreements. The regressive gains of the EU-IDN CEPA are mainly due to the increase in skill wage premia spurred by the additional demand for skill intensive sectors, services in particular.

These results could help policy makers evaluate the relative desirability of the various agreements – even when considering them in combination – according to the goals of their policies. They could also help prepare them in devising compensation strategies as well as policies to help a smoother reallocation of resources.

Despite the advances in the modeling, there is still much need to improve on the analyses of these new generation agreements. A key area is the modeling of non-trade-related barriers, such as investment, competition and labor regulation issues, which form an increasingly more important part of these agreements.

Annex 1 Global Income Distribution Dynamics Model

We use the Global Income Distribution Dynamics (GIDD) model, developed by Bussolo, De Hoyos and Medvedev (2010), to estimate distributional effects. GIDD is a "top-down" micro simulation framework that exploits heterogeneity observed in household surveys to distribute macroeconomic shocks. These shocks are aligned with a macroeconomic model such as the CGE model used in this paper. More specifically, we impose consistency between the GIDD and the CGE models in this paper in various ways. First, both use the same United Nations projections in aggregate population and age and education structures. The GIDD then uses estimates from the CGE model as inputs into the household model. In particular, as inputs into the calculation of changes in per capita household income, the GIDD uses CGE model estimates of differentiated wages for skilled, unskilled, agricultural and non-agricultural labor and changes in the prices of agricultural and non-agricultural goods.[20] Finally, all household incomes are adjusted proportionally so that the percentage change in the aggregate of household incomes in the GIDD is consistent with the CGE model's estimate of the percentage change in real income.

GIDD was developed by the World Bank and was inspired by previous efforts involving simulation exercises (Francois Bourguignon, Bussolo, & Pereira da Silva, 2008; François Bourguignon, Ferreira, & Leite, 2008; Davies, 2009). Previous examples of application using CGE outputs and GIDD include the effect of agriculture distortions in the global economy (Bussolo et al., 2010; Dessus, Herrera, & de Hoyos, 2008), the effect of demographic change on Africa (Ahmed, Cruz, Go, Maliszewska, & Osorio Rodarte, 2014) and external and internal shocks in Africa (Devarajan et al., 2015).

The first step in the microsimulation exercise is to implement a set of changes in the household surveys' demographic structure. The population growth adjustment is particularly important in countries with high fertility rates, such as those in Sub-Saharan African. In practical terms, the adjustment for population growth allows the analysis to explicitly take into account changes in the size of the working-age population. We perform population and education projections during the first stage of the micro-simulation model and in creating the Business as Usual scenario for the CGE model. For each country, we construct the demographic profile in two steps. First, the age and gender composition is exogenously determined following medium variant estimates from the World Population Prospects (United Department of Economic and Social Affairs Population Division, 2015). In a second step, following Bourguignon and Bussolo (2013), country-specific educational profiles are constructed using initial educational achievement levels observed in the household surveys with some conservative yet simple assumptions about educational progress.

More specifically, starting with the household surveys, the country-specific demographic profiles are constructed by partitioning each country's total population into: (1) 16 age-groups (0-4, 5-9, 10-14, …, 65-69, 70-74, 75; (2) two gender groups; and (3) three different levels of educational attainment: (i) No-education or primary; (ii) secondary; and (iii) tertiary education. As mentioned earlier, age and gender totals are based on data from the United Nations' (2015) medium variant population projections. In terms of education, we assume that as the population ages, the average educational attainment in a country increases through a pure pipeline effect, as younger and more educated cohorts replace older cohorts. For example, if at time *t* half of the population in the cohort formed by individuals between 25 and 30 years of age have post-secondary education, then after 10 years (at *t*+10), half of the population between 35 and 40 will have post-secondary education. Furthermore, for younger cohorts we imposed the assumption that

[20] The aggregate returns to capital and labor in the CGE model, however, are not aligned with the household data. See Rutherford & Tarr (2008) for a discussion of the impact of reconciliation of the factor returns in the household data with the input-output table.

there is no improvement in enrollment and graduation rates from those observed at time *t*. In other words, the average educational attainment of these young cohorts in the future is equal to the average educational levels of the 20 to 24 cohort of time *t*. This is a conservative assumption given that the 20 to 24 cohort observed at time t may not have the maximum educational level attainable.[21]

The second step is to adjust factor returns by skill and sector in accordance with the results of the CGE model. The GIDD imposes an entirely new vector of earnings on each worker, conditional on that worker being in sector s and having and educational attainment e. The third step adjusts the average income/consumption per capita to guarantee that it changes exactly in line with the CGE results. Lastly, GIDD constructs a household-specific deflator to adjust for changes in relative prices. The price deflator is constructed using initial and final prices indexes of food versus non-food from the macro model and household-specific budget consumption shares for food and non-food observed in micro data.

Beginning with a distribution of earning from labor by sector and skill $[y_{s,e}]$ in the macro data, define a set of wage gaps as follows:

$$g_{s,e} = \frac{y_{s,e}}{y_{1,1}} - 1 \quad (1)$$

and a similar set of wage gaps for the macroeconomic counterfactual scenario:

$$\hat{g}_{s,e} = \frac{\hat{y}_{s,e}}{\hat{y}_{1,1}} - 1 \quad (2)$$

where $y_{1,1}$ is the average earnings from labor of unskilled workers in agriculture and $\hat{y}_{1,1}$ *and* $\hat{y}_{s,e}$ are their predicted values from the CGE model in the counterfactual scenario. All right hand side values in equation 1 are known data in the CGE model benchmark data set, and all right hand side values in equation 2 are known values in the CGE model simulations.

The micro data will have also a set of wage premia which, in general, will differ from the CGE data. Analogous to equations 1 and 2, define:

$$g'_{s,e} = \frac{y'_{s,e}}{y'_{1,1}} - 1 \qquad (3)$$

$$\hat{g}'_{s,e} = \frac{\hat{y}'_{s,e}}{\hat{y}'_{1,1}} - 1 \quad (4)$$

where $g'_{s,e}$ are the wage premia based on averages by skill group and sector in the household data; $y'_{s,e}$ are the average earnings of labor in sector s and skill group e based on the household data; $y'_{1,1}$ are the average earnings of unskilled labor in agriculture based on the household data; and the $\widehat{g'}$ are the predicted values at the household level as a result of the policy change. All right hand side values of equation 3 are known from the initial household data. In order to calculate $\hat{g}'_{s,e}$, we define:

[21] In practical terms, the micro-simulation model recalibrates each household sample weight to match the age, gender, and education projected totals. A new probability distribution can be obtained by solving an optimization problem based on a minimum cross-entropy criterion as in Olivieri et al. (2014). The minimum cross-entropy method assures that the new sets of age, gender and education, deviate as little as possible from the initial distributions. See Wittenberg, (2010) for a technical description and implementation of this method.

$$\hat{g}'_{s,e} = g'_{s,e}\frac{\hat{g}_{s,e}}{g_{s,e}} \quad (5)$$

We may calculate the left hand side of equation 5, since the three values on the right hand side are known from equations 1, 2, and 3. Equation 5 implies that even if initial wages differ between the CGE and micro models, the percentage change in the wage gaps will be consistent across the two models. By passing on percentage changes in wage premia by type of worker, instead of percentage changes in wages, the possibility of wage gaps moving in opposite directions in the macro and household data is eliminated. Within each group of workers, distributional changes occur; but, on average, for any group of workers, the relative wages for each type of worker are constrained to be consistent with the corresponding growth rates from the CGE model.

Given the known values in equations 1-5, and defining average wages for unskilled labor in agriculture as numeraire in the GIDD, so that $y'_{1,1} = \hat{y}'_{1,1}$, it is possible to calculate the percentage changes in average wage income of households in sector *s* and skill level *e* that are consistent with wage gaps expressed in Equation 5:

$$\hat{y}'_{s,e}/y'_{s,e} \quad (6)$$

Note that Equation 6 only operates on labor income. In order to adjust the micro data such that the weighted average percentage change in the per capita income/consumption across all households matches the change in real consumption per capita in the CGE model, a subsequent adjustment is carried out. Define Y as real per capita income calculated from the CGE model in the benchmark and $\hat{Y}$ as its predicted value in the CGE model simulation. Define $\gamma'_h = \sum_{i\in h} y'_{i,h}/n_h$ as the per capita income of household h in the benchmark equilibrium, where $y'_{i,h}$is the income of the ith member of household *h*, and n is equal to the size of household *h*; . similarly, define $\lambda\hat{\gamma}'_h = \sum_{i\in h} \lambda\hat{y}'_{i,h}/n_h$where $\hat{y}'_{i,h}$ and $\lambda\hat{y}'_{i,h}$ are the unadjusted and adjusted values, respectively, of the income of the ith member of household *h* in the counterfactual of the micro-model; the role of λ is explained by equation 14 below. Then define Y'as the weighted average value of real per capita income across all households, i.e.,

$\sum_h \nu_h \gamma'_h = Y'$ (7)

where ν_h is the weight of household *h* in aggregate income in the benchmark. Correspondingly

$\sum_h \omega_h \lambda\hat{\gamma}'_h = \hat{Y}'$ (9) <note – skipped equation 8?>

is the weighted average per capita income value in the policy simulation. Note that $\sum_h \upsilon_h = 1$, $\sum_h \omega_h = 1$ and λ is a scalar. Equations 11 and 12 allow for different household weights since the weights of the households will typically change over time. So that the percentage change in the aggregate value of household income is consistent with the CGE model, we constrain $\hat{Y}'$ by equation 13:

$$\hat{Y}' = Y'\frac{\hat{Y}}{Y} \quad (10)$$

We implement this constraint in a distribution neutral way. That is, we adjust all household income in the counterfactual by a scalar λ such that per capita household income equals $\lambda\hat{\gamma}'_h$: as a result, λ can be defined by:

$$\lambda\sum_h \omega_h \hat{\gamma}'_h = Y'\frac{\hat{Y}}{Y} \quad (11)$$

Despite the fact that the GIDD ignores other forms of income, such as capital income, this transformation guarantees consistency between the weighted average household income assessment and the CGE model assessment. For poor households, which is the main focus of our work, the assumption should be reasonably accurate, since poor households have little capital income. There is more of a margin of error for wealthier households. But for these households, it is skilled labor rather than unskilled labor that tends to be more important and Bussolo et al., (2010) have noted a tendency for skilled wage and returns to capital to be correlated.

Finally, macroeconomic estimates of changes in agricultural and non-agricultural prices are distributed across heterogeneous households using the following method. Let us define the initial per capita monetary income of household h, γ_h', and the purchasing power of household h, γ_h^r, as the ratio of its monetary income divided by a household-specific price index capturing the household's consumption patterns in terms of food and non-food expenditure:

$$\gamma_h^r = \frac{\gamma_h'}{P_h} = \frac{\gamma_h'}{\alpha_h P_f + (1 - \alpha_h) P_{nf}} \qquad (12)$$

where P_f and P_{nf} are food and non-food price indices and α_h is the proportion of household's h budget spent on food.

The α_h parameter in the denominator of the right hand side of Equation 12 can be estimated with household data using the following specification:

$$\alpha_h = \beta_0 + \beta_1 \ln(\gamma_h') + e_h \qquad (13)$$

where e_h is a vector of household-specific errors that are assumed to be distributed with $E(e_h) = 0$ and $V(e_h) = \sigma^2$. Assuming that estimated parameters $\hat{\beta}_0$ and $\hat{\beta}_1$ remain constant, the new budget share spent on food for household h, α_h', at the counterfactual per capita income, $\lambda\hat{\gamma}_h'$, can obtained from:

$$\hat{a}_h' = \hat{\beta}_0 + \hat{\beta}_1 \ln(\lambda\hat{\gamma}_h') + \hat{e}_h \qquad (14)$$

The changes in real per capita incomes brought about by a change in relative prices of food versus non-food can be approximated by the following linear expression:

$$\hat{\gamma}_h^r = \frac{\lambda\hat{\gamma}_h'}{\hat{a}_h' P_f' + (1 - \hat{a}_h') P_{nf}'} \qquad (15)$$

where $\hat{\gamma}_h^r$ in Equation 15 is the real per capita income adjusted for changes in relative prices of food versus non-food. $\hat{\gamma}_h^r$ is the counterfactual measure of real per capita income of household h for the analysis of poverty and shared prosperity.

Table A1. Sectors and countries/regions included in the global CGE model.

Sectors	Countries/Regions
Agriculture	Australia
Natural resources / mining	Brunei Darussalam
Food, beverages, tobacco	Canada
Textiles	Chile
Wearing apparel and leather	Japan
Chemical, rubber, plastic products	Malaysia
Metals	Mexico
Transport equipment	New Zealand
Electronic equipment	Peru
Machinery and equipment	Singapore
Other manufacturing	United States
Utilities	Vietnam
Construction	Brazil
Trade and transport	Russian Federation
Finance and other business services	India
Communication and business services	China
Social services	South Africa
	EU28
	Egypt, Arab Rep.
	Colombia
	Turkey
	Thailand
	Korea, Rep.
	Philippines
	Indonesia
	Bangladesh
	Cambodia
	Lao PDR
	Kenya
	Ethiopia
	Sri Lanka
	Tanzania
	Southeast Asia
	Rest of South African Customs Union
	Rest of the world

Annex 2 Translating macro into micro results

For each scenario, Table A2 shows the magnitude of the LINKAGE aggregate variables that are obtained from the general equilibrium macro model and that are later used in each one step of the microsimulation framework. The table shows annual percentage changes for the baseline scenario and, for each of the alternative scenarios, percentage point deviations with respect to the baseline. Household consumption is expected to grow at an annual rate of 3.9 percent shifting demand towards the non-agricultural sector, which tends to be more skill-intensive. Partly driven by semi-exogenous assumptions on education projections, labor in the non-agricultural sector grows 1.37 percent for the skilled and 1.14 for the unskilled, on an annual basis. With overall shift in final demand towards services and skilled-intensive manufacturing, the general equilibrium effect increases wages for skilled relative to unskilled workers and prices of food relative to non-food prices; with both effects having regressive consequences in the baseline.

Table A2. Macro-micro linkage variables, annual % change 2015-2030 and deviations w.r.t baseline

Macro-micro linkage variable	Baseline	EU-IDN	FTAAP	TPP-15	RCEP	TPP-11
	annual % change	percentage points w.r.t baseline				
(a) Household consumption growth	3.90	0.18	0.10	0.06	0.03	0.00
(b) Labor by sector and skilled						
Unskilled agri	-0.87	-0.05	-0.35	-0.24	0.06	-0.01
Skilled agri	-1.04	0.01	-0.38	-0.26	0.06	-0.02
Unskilled non-agri	1.14	0.01	0.04	0.03	-0.01	0.00
Skilled non-agri	1.37	0.00	0.00	0.00	0.00	0.00
(d) Income from labor						
Unskilled labor	4.87	0.22	0.13	0.10	0.02	-0.01
Skilled labor	6.02	0.22	0.14	0.11	0.03	0.00
(d) Prices						
Food, cpi	0.15	0.04	-0.09	-0.05	-0.07	-0.01
Non-food, cpi	0.04	0.00	0.02	0.03	0.01	-0.01

References

Ahmed, A. S., Cruz, M., Go, D. S., Maliszewska, M., & Osorio Rodarte, I. (2014). *How Significant is Africa's Demographic Dividend for its Future Growth and Poverty Reduction?*

Amiti, M., and Cameron, L. (2012). Trade liberalization and the wage skill premium: Evidence from Indonesia. *Journal of International Economics*, *87*(2), 277-287.

Amiti, M., and J. Konings. (2007). Trade Liberalization, Intermediate Inputs, and Productivity: Evidence from Indonesia. *American Economic Review*, *97*(5), 1611-1638.

Ahmed, S. A., M. Cruz, D. S. Go, Maliszewska, M., and Osorio-Rodarte, I. (2014). *How Significant is Africa's Demographic Dividend for its Future Growth.* World Bank Policy Research Working Paper 7134.

Balistreri, E.J., Tarr, D.G., and Yonezawa, H. (2014). *Reducing Trade Costs in East Africa: Deep Regional and Multilateral Action*. World Bank Policy Research Working Paper 7049.

Balistreti, E. J., Maliszewska, M., Osorio Rodarte, I., Tarr, D. G., & Yonezawa, H. (2016). *Poverty and Shared Prosperity of Deep Integration in Eastern and Southern Africa* (Policy Research Working Paper Series). Retrieved from http://documents.worldbank.org/curated/en/905551468180262500/Poverty-and-shared-prosperity-implications-of-deep-integration-in-Eastern-and-Southern-Africa

Bourguignon, F. and Bussolo, M. (2013). Income Distribution in Computable General Equilibrium Modeling. In P.B. Dixon and D.W. Jorgenson (Eds.), *Handbook of Computable General Equilibrium Modeling.* North Holland: Elsevier B.V. 1B: 1383-1438.

Bourguignon, F., Bussolo, M., and Pereira Da Silva, L. A. (2008). *The Impact of Macroeconomic Policies on Poverty and Income Distribution: Macro-Micro Evaluation Techniques and Tools*. Houndmills, Basingstoke, Hampshire; New York Washington, DC: Palgrave Macmillan; World Bank. Retrieved from http://Www.Loc.Gov/Catdir/Toc/Ecip081/2007040478.Html

Bourguignon, François, Ferreira, F. H. G., & Leite, P. G. (2008). Beyond Oaxaca–Blinder: Accounting for differences in household income distributions. *The Journal of Economic Inequality*, *6*(2), 117–148. https://doi.org/10.1007/s10888-007-9063-y

Bussolo, M., de Hoyos, R. and Medvedev, D. (2010a). Economic Growth and Income Distribution: Linking Macro Economic Models with Household Survey Data at the Global Level. *International Journal of Microsimulation 3*(1), 92-102.

Bussolo, M., de Hoyos, R., and Medvedev, D. (2010b). Global Income Distribution and Poverty in the Absence of Agricultural Distortions. In K. Anderson, J. Cockburn, and W. A. Martin (Eds.), *Agricultural Price Distortions, Inequality and Poverty*. London: Palgrave; Washington, D.C.: World Bank.

Ciuriak, D., and Xiao, J. (2014). *Impact of Taiwan's TPP Accession on the United States*. Ciuriak Consulting Research Report.

Davies, J. B. (2009). Combining Microsimulation with CGE and Macro Modelling for Distributional Analysis in Developing and Transition Countries. *International Journal of Microsimulation*, *2*(1), 49–65.

Dessus, S., Herrera, S., & de Hoyos, R. (2008). *The impact of food inflation on urban poverty and its monetary costs: some back-of-the-envelope calculations* (Policy Research Working Paper No. 4666). Retrieved from http://elibrary.worldbank.org/doi/pdf/10.1596/1813-9450-4666

Devarajan, S., Go, D. S., Maliszewska, M., Osorio-Rodarte, I., and Timmer, H. (2015). Stress-Testing Africa's Recent Growth and Poverty Performance. *Journal of Policy Modeling, 37*(4), 521–547.

Duggan, V., Rahardja, S., and Varela, G. (2013). *Service Sector Reform and Manufacturing Productivity: Evidence from Indonesia*. World Bank Policy Research Working Paper.

Francois, J., M., Manchin, H., Norberg, O., Pindyuk, and Tomberger, P. (2015). *Reducing Transatlantic Barriers to Trade and Investment: an Economic Assessment*. Working Paper 1503, Johannes Kepler Universität Linz

Fontagné, L., Guillin, A., and Mitaritonna, C. (2011). *Estimations of Tariff Equivalents for the Services Sectors*. CEPII Working Paper 2011- 24, December 2011.CEPII.

Hofmann, C., Osnago, A., and Ruta, M. (2018). The Content of Preferential Trade Agreements. *World Trade Review*.

International Trade Centre (ITC), and Market Access Map (MAcMap). (2015). *Tariff Rates for 2014–2031 between TPP Member Countries Absent the TPP Agreement*. Prepared for the Global Economic Partnership Agreement Research Consortium.

Kee, H.L., Nicita, A., and Olarreaga, M. (2008). Import Demand Elasticities and Trade Distortions. *The Review of Economics and Statistics*, *90*(4), 666-682

Kis-Katos, K., and Sparrow, R. (2015). Poverty, labor markets and trade liberalization in Indonesia. *Journal of development Economics*, *117*, 94-106.

Lakatos, C., Maliszewska, M., Osorio-Rodarte, I., & Go, D. S. (2016). *China's slowdown and rebalancing: potential growth and poverty impacts on Sub-Saharan Africa* (Policy Research Working Paper No. 7666). Retrieved from http://documents.worldbank.org/curated/en/2016/05/26362958/chinas-slowdown-rebalancing-potential-growth-poverty-impacts-sub-saharan-africa

Loayza, N., Schmidt-Hebbel, K., and Serven, L. (2000). *What Drives Private Saving Around the World*. World Bank Policy Research Working Paper 2309.

Mahadevan, R., Nugroho, A. and Amir, H. (2017). Do inward looking trade policies affect poverty and income inequality? Evidence from Indonesia's recent wave of rising protectionism. *Economic Modelling* 62; 23-34.

Market Access Map (MAcMap). 2016. *Tariff Rates for 2016–2046 between TPP Member Countries under the TPP Agreement*. Prepared for the Global Economic Partnership Agreement Research Consortium.

Narjoko, D., Anas, T., and Herdiyanto, R. (2018). The Elusive Pursuit of Import Substitution in 21st Century Indonesia. *Asian Economic Papers*, *17*(1): 73-93.

Olivieri, S., Radyakin, S., Kolenikov, S., Lokshin, M., Narayan, A., & Sanchez-Paramo, C. (2014). *Simulating Distributional Impacts of Macro-dynamics: Theory and Practical Applications*. The World Bank. https://doi.org/10.1596/978-1-4648-0384-0

Osorio-Rodarte, I. (2016). *Modeling Distributional Effects of Macroeconomic Shocks: Increasing Female Participation and Human Capital in Turkey*. GTAP Conference Paper. Washington, D.C.

Petri, P. A., Plummer, M. G., and Zhai, F. (2012). *The Trans-Pacific Partnership and Asia-Pacific Integration: A Quantitative Assessment*. Policy Analyses in International Economics 98. Washington: Peterson Institute for International Economics.

Petri, P. A., and Plummer, M. G. (2016). *The Economic Effects of the Trans-Pacific Partnership: New Estimates*. Peterson Institute for International Economics Working Paper No. 16-2.

Ravallion, M., and Chen, S. (2011). Weakly Relative Poverty. *Review of Economics and Statistics*, *93*(4), 1251-1261.

Rutherford, T. F., & Tarr, D. G. (2008). Poverty effects of Russia's WTO accession: Modeling "real" households with endogenous productivity effects. *Journal of International Economics*, *75*(1), 131–150. https://doi.org/10.1016/J.JINTECO.2007.09.004

Topalova, P. (2004). *Trade Liberalization and Firm Productivity: The Case of India*. IMF Working Paper, No. 04/28.

United Department of Economic and Social Affairs Population Division. (2015). World Population Prospects: the 2015 Revision. Retrieved from http://esa.un.org/unpd/wpp/DVD/

van der Mensbrugghe, D. (2011). *LINKAGE Technical Reference Document Version 7.1*. Washington D.C.: World Bank. Retrieved from http://siteresources.worldbank.org/INTPROSPECTS/Resources/334934-1314986341738/TechRef7.1_01Mar2011.pdf

Wignaraja, G., Morgan, P., Plummer, M. G., and Zhai, F. (2015). Economic Implications of Deeper South Asian–Southeast Asian Integration: A CGE Approach. *Asian Economic Papers*, *14*(3), 63-81.

Wittenberg, M. (2010). An introduction to maximum entropy and minimum cross-entropy estimation using Sta. *The Stata Journal*, *10*(3), 315–330

World Bank. (2016a). *Potential Macroeconomic Implications of the Trans-Pacific Partnership*. Chapter 4 of Global Economic Prospects 2016: Spillovers amid Weak Growth. Washington DC: World Bank

World Bank. (2016b). *The Trans-Pacific Partnership and its Potential Economic Implications for Developing East Asia and Pacific*. Chapter II.B. of East Asia and Pacific Economic Update April 2016: Growing Challenges. Washington DC: World Bank

World Bank. (2013). *China 2030: Building a Modern, Harmonious, and Creative Society*. *The World Bank*. Washington, D.C. https://doi.org/10.2139/ssrn.1188022

Yu, M. (2015). Processing Trade, Tariff Reductions and Firm Productivity: Evidence from Chinese Firms. *The Economic Journal, 125*(585), 943–988.