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The Trans-Pacific Partnership and Asia-Pacific Integration: A Quantitative Assessment

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Abstract

Two emerging tracks of trade agreements in the Asia-Pacific—one based on the proposed Trans-Pacific Partnership (TPP) agreement and an Asian track—could consolidate the "noodle bowl" of current smaller agreements and provide pathways to a Free Trade Area of the Asia-Pacific (FTAAP). We examine the benefits and strategic incentives generated by these tracks over 2010-2025. The effects on the world economy would be small initially but by 2025 the annual welfare gains would rise to $104 billion on the TPP track, $303 billion on both tracks, and $862 billion with an FTAAP. The tracks will be competitive but their strategic implications are constructive: each would generate incentives for enlargement. Over time, strong economic incentives would emerge for the United States and China to consolidate the tracks into a region-wide agreement. Each track would bring a different template to such consolidation and can be viewed as defining a "disagreement point" in the Asia-Pacific bargaining game. The study is based on an analysis of 48 actual and proposed Asia-Pacific trade agreements and models impacts on variables including sectoral trade, output, employment and job shifts in 24 world regions.

Keywords: Trans-Pacific Partnership, Asian economic integration, U.S. trade policy, free trade areas, regional economic integration.

JEL codes: F12, F13, F14, F15, F17.

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1. Introduction

Since the conclusion of the Uruguay Round the development of international trade rules has drifted from global to regional and bilateral agreements. The United States has not participated actively in this shift and the Trans-Pacific Partnership (TPP), now in negotiation, could become its first significant regional agreement since the North American Free Trade Agreement (NAFTA). The TPP is also a possible pathway to the larger Free Trade Area of the Asia-Pacific (FTAAP). This study examines the potential benefits and costs of the TPP and its strategic implications for economic integration in the Asia-Pacific.

The few regional initiatives that the United States has recently supported have not been particularly successful. An effort to position the Asia Pacific Economic Cooperation (APEC) forum as a venue for binding agreements ended with the failure of the "Early Voluntary Sectoral Liberalization" initiative in 1998. U.S. proposals for a Free Trade Area of the Americas did not attract enough support. And the FTAAP, although endorsed by APEC leaders, has met with little enthusiasm so far. In these efforts, U.S. expectations for market access have clashed with the sensitivities of diverse partners and domestic politics. Since most U.S. trade partners already have reasonably good access to U.S. markets, they have limited incentives to accommodate stringent U.S. demands. The expiration of "fast track" authority in the United States in 2007 will make reaching trade agreements even more complicated in the future.

Against this challenging background, the United States is working with eight other countries to make the TPP a cutting-edge, "21st century agreement" (USTR 2011). The initiative covers relatively little trade now, but it is ambitious in terms of issues and membership, encompassing advanced, emerging, and low-income countries. It aims to form the core of an Asia-Pacific-wide agreement with important implications for the global trade architecture.

The TPP negotiation is more likely to succeed than prior regional efforts that involved the United States because the participants are like-minded, open economies. Also, since trade measures

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[1] This paper reports initial results. We plan to update the study as further information about the TPP and other agreements becomes available and to make improvements in the scenarios, parameters and other components of the model. This study was conducted with the support of the East-West Center and in cooperation with the Peterson Institute for International Economics. The authors gratefully acknowledge helpful comments by Fred Bergsten, Christopher Findlay, Rachel McCulloch, Charles Morrison and Jeffrey Schott; members of a study group held at the Peterson Institute; participants in a "China Track 1.5 Dialogue" organized by the East West Center and the Carnegie Endowment; and Professors Jagdish Bhagwati and Merit Janow and their students at Columbia University.

usually attract bipartisan support, an agreement seen as beneficial to the United States could be acceptable to Congress despite current political divisions. Still, an agreement will not come easily, especially in the context of slow economic growth. Internationally, U.S. markets are important, but are becoming less so compared to those of other, more rapidly growing economies. Domestically, the politics of trade remains contentious. Thus, the scenarios used in this study to analyze ambitious paths of future agreements—designed to highlight welfare and trade effects— may strike some as unrealistic. But there is no doubt that the TPP is a serious initiative and warrants careful analysis.

An assessment of the TPP must account for three unusual features of a potential agreement. First, the negotiations are emerging in the context of other trade initiatives in Asia. We therefore need to analyze interactions between two parallel efforts—the "Trans-Pacific track" and an "Asian track"—that will evolve and perhaps converge over the next 15 years. Second, the benefits of the TPP depend more on its impact on the future of the Asia-Pacific trading system—the development of a workable, high-quality template for regional integration—than on immediate gains from trade. Accordingly, we need to understand how the agreement will affect incentives for enlargement and the templates used in future negotiations. Third, the TPP involves relatively new issues ranging from services to logistics. Models of the TPP need to capture policies in these channels. This study attempts to address each of these issues.

Briefly, our results suggest that the two tracks are viable and largely complementary pathways to Asia-Pacific integration. Each track should generate substantial gains; each is likely to grow; and each will stimulate progress on the other. The tracks will compete with each other (mainly in the templates adopted) but will generate incentives for consolidation into a region-wide agreement. That outcome would be especially attractive to the region and the world, yielding benefits comparable to those that could have been obtained from a successful Doha Round.

Section 2 reviews the origins of the TPP and the objectives of the United States and other economies. Section 3 analyzes possible provisions of the agreement. Section 4 describes the model, data, and the methodology of the study. Section 5 examines welfare and trade results. Section 6 uses a strategic, game-theoretic perspective to explore why countries might agree on an initial framework and subsequent enlargements. Section 7 views the results from national perspectives, analyzing the role of key economies in the negotiations. Section 8 provides sensitivity results and Section 9 concludes.

2. Why and how the TPP became a priority

The TPP negotiations are emerging amidst great uncertainty about the global trading system. After a decade of work, the Doha Development Agenda is collapsing. A Doha agreement would have been required by 2007 to come under U.S. fast-track negotiating authority, and by mid-2011 to avoid the politics of election cycles in the United States and elsewhere. These and many other deadlines were missed. In 2011, even modest efforts to find "alternative deliverables"— agreements on market access for Least Developed Economies, environmental goods and services, and trade facilitation—appear to be failing.

Meanwhile, a wave of bilateral and regional free trade agreements has swept across the Asia-Pacific (Figure 1). Before 2000, only four major agreements among multiple APEC economies had been signed—the ASEAN Free Trade Area, the Canada-U.S. Free Trade area, the North American Free Trade Area, and the Australia-New Zealand Closer Economic Relations accord. Today there are 39, with others in negotiation. Most link ASEAN countries and Asian partners including China, Japan and Korea; proposals envision expanding this network into an East Asian Free Trade Area (EAFTA, consisting of ASEAN, China, Japan and Korea) or a Comprehensive Economic Partnership for East Asia (CEPEA, EAFTA plus Australia, India and New Zealand).

Some Asian economies have also partnered with the United States, Latin American countries and Europe, but no clear framework has emerged so far to guide Trans-Pacific integration. APEC is committed to achieving "free trade and investment in the Asia Pacific" but it is not a forum for negotiating such an agreement. However, in 2006 four APEC economies—Brunei Darussalam, Chile, New Zealand, and Singapore—established a Trans-Pacific Strategic Economic Partnership

Figure 1. Trends in Asia-Pacific trade agreements
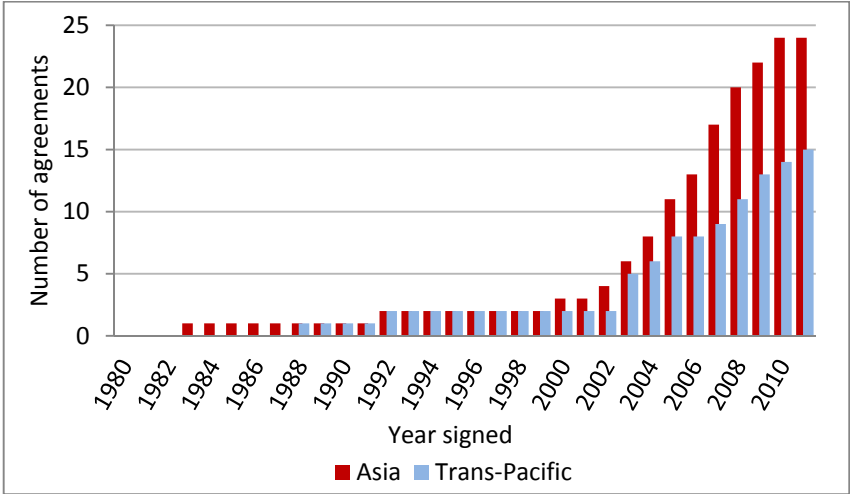
Note: among APEC members.
Source: ESCAP database (see also detail in Table 4). Simdata/t-agree

(also known as the P4) with such objectives in mind (Fergusson and Vaughn 2009, WTO 2008). These are small, open, liberal economies with modest interactions. From early on, they saw the P4 not as an end in itself, but as a pathfinder for an inclusive Trans-Pacific effort (Elms 2009).

The shift from global to regional negotiations is rooted in deep political-economic causes. The world economy is becoming multi-polar; international linkages are increasingly complex; and past agreements have eliminated many of the most tractable trade barriers. Further liberalization now requires incremental steps—among groups of close partners or on narrow sets of issues—in order to simplify the negotiations, reduce adjustment costs (which depend on the rapidity of adjustment), and mitigate political opposition. These factors explain the trend toward bilateral and regional negotiations, but also raise questions about how multiple agreements might be consolidated. This study explores that dynamic for Asia-Pacific agreements.

At the close of the Bush administration in September 2008, United States Trade Representative Susan Schwab announced U.S. interest in joining the TPP. A year after taking office, President Obama took up the initiative and the administration notified Congress of its intention to create a "high-standard, broad-based regional pact." Other new partners included Australia, Peru and Vietnam; Malaysia joined in 2010 to complete the current "TPP9." Nine rounds of intensive negotiations—reportedly including around 400 negotiators in each session—were scheduled between March 2010 and the November 2011 APEC Summit in Honolulu. At that time, negotiators hope to announce a framework agreement.

Transforming the P4 into the TPP would reshape the landscape of Asia-Pacific integration. From the perspective of U.S. economic interests, it would serve four goals. First, the TPP would create a comprehensive, modern template—an alternative to a strong global agreement—for economic partnerships involving the United States. It would cover issues that were absent from the Doha negotiations or could not yield progress there, such as services, investment, competition, and regulatory coherence. These issues are widely seen as crucial for the next wave of economic integration and often involve sectors in which the United States has comparative advantage. Goods liberalization under GATT offers an important example. That effort too was promoted by the United States because it then favored American exports, but in time it generated wide gains.

Second, the TPP would promote deeper integration in the Asia-Pacific; in words attributed to Secretary of State James Baker in 1989, it could prevent "drawing a line in the middle of the Pacific." Whether such deeper integration results from the FTAAP or another similar agreement, it would be the grand prize in Asia-Pacific commercial diplomacy. Integration spanning the Asia-Pacific would deliver much greater benefits to the United States and other key economies, including China, than any narrower effort. One-third of all world trade takes place among APEC economies and our results suggest that a rigorous agreement covering that trade could yield benefits of the same order of magnitude as had been expected from the Doha Round.

Third, the TPP would provide a model for consolidating existing trade agreements (there are fourteen bilateral or regional agreements spanning the countries now negotiating the TPP[2]) and thus chart a way out of the current "noodle bowl" of overlapping rules in the Asia-Pacific and beyond. Inconsistent rules of origin are particularly problematic; they impose costs of compliance and generate incentives to diminish rather than increase productivity.

Finally, the TPP would help to level the playing field for U.S. exports to Asian markets. A substantial number of FTAs by ASEAN, China and Japan now exclude the United States and could divert trade and investment from it. In combination with other U.S. initiatives to strengthen the competitiveness of the U.S. economy, the TPP could help to increase U.S. exports. In this study, we do not find much evidence of trade diversion by current or future Asian trade

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[2] These include: ASEAN FTA (AFTA); ASEAN-Australia/New Zealand FTA; Closer Economic Relations between Australia and New Zealand (CER); US-Australia FTA; US-Singapore FTA; US-Chile FTA; Peru-US FTA; Peru-Singapore FTA; Peru-Chile FTA; Malaysia-New Zealand FTA; New Zealand-Singapore FTA; Singapore-Australia FTA; Chile-Australia FTA; and the P4.

agreements from the United States; if anything, they appear to increase U.S. welfare slightly.[3] But we do find substantial U.S. gains from the TPP even absent injury from Asian agreements.

This study is focused on economic effects but, as most other trade initiatives, the TPP has geopolitical as well as economic objectives. From a U.S. perspective, the agreement would serve strategic objectives by deepening U.S. engagement with Asia. As Secretary of State Hilary Clinton recently put it, "America's future is linked to the future of the Asia-Pacific region; and the future of this region depends on America. The United States has a strong interest in continuing its tradition of economic and strategic leadership, and Asia has a strong interest in the United States remaining a dynamic economic partner and a stabilizing military influence" (Clinton 2010).

Given the serious challenges facing the U.S. and world economies in the aftermath of the Great Recession, it is natural to ask how a TPP agreement might contribute to the recovery. This study examines the direct micro-economic effects of the TPP agreement—on trade, welfare and adjustments—and those begin to take hold only around 2015 and beyond. However, the agreement might affect investment and asset prices in the United States and abroad earlier through investor expectations. For example, investors could interpret a strong agreement as evidence of effective U.S. engagement in the Asia-Pacific and improved prospects for growth in the region. Such potentially positive implications for investor confidence are not examined in this study.

Internationally, APEC leaders have endorsed an FTAAP covering all 21 member economies and recognized the TPP, EAFTA and CEPEA as potential pathways to it (APEC 2010). But opinions differ sharply on the intent and effect of these pathways. Some analysts argue that these agreements could help to unify the noodle bowl (Ravenhill 2010). But others see the TPP instead as an effort to isolate China and warn that it could create an "adversarial political psychology" in the China-U.S. relationship (Drysdale 2011). Some describe the TPP even more dramatically as a "geopolitical and diplomatic power play, and a kind of economic warfare within the Asia Pacific region" (Rowley 2011). In turn, some U.S. observers see Asia-only integration efforts as attempts to minimize the influence of the United States.

Our results argue against these apocalyptic views; the parallel development of the TPP and Asian tracks appears to yield large, mutual benefits to both sides of the Pacific. The tracks may develop for competitive reasons, but should encourage cooperation. They will reduce obstacles to further integration—in part by spreading out adjustments—and amplify the gains specifically to the United States and China from an overall region-wide agreement. But competition will remain a salient feature of the tracks as countries attempt to align rules with their interests. A key policy implication, therefore, is that special efforts should be made to keep the paths consistent with eventual cooperation.

3. Potential structure of the TPP

The challenge of the TPP is to develop rigorous rules on new issues in international economic relations while advancing broad Asia-Pacific integration. There is inherent tension between these

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[3] Some U.S. producers would be disadvantaged by those agreements and can be expected to oppose having the U.S. excluded from them.

objectives. On one hand, high-quality trade agreements involve sophisticated disciplines that constrict policy space; on the other, an inclusive Asia-Pacific framework requires provisions accessible to diverse economies. The effects of the TPP will depend on its details; this section identifies controversial issues that may tilt the balance one way or the other.

Creating a 21st century agreement means addressing many issues, some of which have received little attention in past negotiations. Those mentioned as potentially central to the TPP include industrial goods, services, intellectual property rights, competition policy, safety standards, labor and environment, among others. Negotiators are attempting to address these areas in the context of "cross-cutting" issues such as regulatory coherence, competitiveness and business facilitation, the promotion of the small- and medium-sized enterprise sector, and deeper production and supply chain linkages. The negotiations are further complicated by obligations under existing FTAs; for the time being, a messy, hybrid approach appears to have been adopted, leaving it up to countries whether to retain old FTAs, and whether to make new offers on a bilateral or multilateral basis (Barfield 2011).

At this writing, the structure of the TPP agreement is not known, but reports suggest that it will cover most or all of the 26 issues listed in Table 1. This is not a definitive list and appears to be changing over time. The number of chapters is likely to be somewhat smaller, with some issues combined into chapters, and others appearing in multiple chapters. We separate issues into those with extensive precedents in prior Asia-Pacific accords and those with few.[4] Of course, an issue may have been neglected by past agreements not because it is new, but because it was too sensitive to have been included. For example, agriculture and financial services have been absent from most Asian accords. Services have appeared in many agreements, but often with limited coverage. Substantial coverage of culture and regulatory coherence would be new with the TPP.

If our expectations are correct, a majority of TPP provisions will deal with "behind-the-border" issues. Economic interactions increasingly involve deeper linkages and require coherent national regulations. These issues are bound to generate disagreements among TPP partners and potential future members since they address policies that were traditionally managed domestically, including the regulation of competition, labor, the environment, foreign investment and intellectual property. Emerging economies will be particularly concerned that the new rules will limit their ability to climb the technology ladder. Compromises will be difficult, yet it's hard to envision a deeply integrated global economy without cooperation on these issues.

Table 1 also summarizes potential controversies in the TPP, based on press reports and public commentary. At least four fault lines appear to be emerging, with several involving provisions that reflect U.S. corporate or political objectives.

First, the United States is reportedly proposing more stringent intellectual property rights (IPR) provisions than were included in past agreements, including WTO TRIPS. Since most TPP economies are net IPR importers, some have challenged the need to go beyond TRIPS. The outcome of this debate will affect the division of benefits between IPR exporters and importers,

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[4] We define those with "extensive precedents" as issues that had substantial coverage in at least half of the existing 38 Asia-Pacific trade agreements.

Table 1. The TPP as a 21st century agreement

Issue	Prior coverage (% of accords)	Mostly behind the border?	Possible content	Expected controversies
A. Issues with extensive precedents				
Goods	100	No	Reduce customs duties; specify customs valuation methodology; establish oversight committees; provide for exceptions and special treatment of sensitive products.	There will be difficult negotiations on exclusion lists and time path of liberalization; advanced countries will resist reducing barriers on labor-intensive goods.
Services	91	Yes	Require national and MFN treatment; bar performance requirements; require regulations to be transparent and not unduly burdensome; ensure transfers and payments; address licenses and certifications obtained abroad.	The diversity of services and limited prior multilateral liberalization will make negotiations difficult. Advanced economies seek broad and strict disciplines; emerging economies may want exclusions and slow implementation.
Technical barriers	69	Yes	Require implementation of WTO agreements; encourage mutual acceptance of technical regulations and conformity assessment; establish mechanisms for cooperation.	Advanced economies seek "WTO+" features. Developing economies want to avoid ambitious TBT measures and potential disguised protectionism.
Competition	66	Yes	Require measures against anticompetitive business conduct; ensure competitive neutrality of policy with respect to government enterprises; require national treatment and enforcement authority.	Economies that do not have explicit competition policies and/or have a significant state-owned sector could face significant reform requirements.
Intellectual property rights	77	Yes	Require accession to international treaties; require effective enforcement of criminal and civil penalties in case of knowing violations; require destruction of pirated or counterfeit goods.	Highly controversial; affects especially pharmaceuticals and information technology. Exporters seek provisions beyond TRIPS, such as accession to WIPO treaties. Resistance from importers, competitive producers, national health systems, NGOs. Developing countries may want to regulate bio-prospecting.
Investment	74	Yes	Require national and MFN treatment under international law; bar performance requirements; limit expropriation; require compensation; ensure free and timely transfers; establish procedures for dispute resolution by international tribunals.	High priority for all TPP economies but are differences on sectoral coverage and ownership limits. Some countries seek investor-state arbitration, as provided in bilateral investment treaties; this is opposed by NGOs and some governments.
Government procurement	66	Yes	Require national treatment and nondiscrimination consistent with the WTO agreement; specify rules of origin; establish standards for transparency; provide for supplier challenges.	Only two TPP economies have acceded to WTO accords; three others are observers. Members will push for strong provisions and observers will likely follow, but non-members will seek high *de minimis* rules.
Sanitary and phytosanitary standards	69	Yes	Ensure appropriate protection of human, animal, and plant health; establish committees for ongoing cooperation.	The details of acceptable standards are complicated. Less-advanced economies will seek *de minimis* rules, assurances against hidden protectionism, and technical assistance.

Dispute settlement	91	No	Create procedures for convening dispute settlement panels; authorizes monetary penalties and suspension of benefits when other methods of resolving a dispute fail. May provide for international arbitration.	Relatively uncontroversial.
Rules of origin	94	No	Establish rules for determining when a product originates in the FTA; set *de minimis* standards; list exceptions; provide for verification, documentation and consultation.	Negotiations involve product-by-product detail. Cumulation is an important test of the TPP's ability to consolidate the "noodle bowl."
Trade remedies	66	No	Provide for temporary, bilateral safeguards in the event (or threat) of injury to domestic industry; limit the scale and duration of safeguard actions.	While trade remedies are controversial, the template is less so.
Customs procedures	86	No	Define procedures for customs administration affecting transparency, advance rulings, review and appeal.	High priority for most economies, but emerging economies will be cautious about implementation costs and commitments; technical assistance may be helpful.
Temporary entry	54	No	Provide for short-term entry of business persons on an expedited basis.	Relatively uncontroversial; issues arise on qualifications of service providers.
B. Issues with few precedents				
Institutions	43	No	Provide for mechanisms such as joint committees to supervise implementation.	Relatively uncontroversial.
Financial services	26	Yes	Accord national and MFN treatment; ensure transparency of regulation; limit caps on institutions and transactions; permit cross-border trade; establish consultations and dispute resolution.	Highly controversial; some advanced countries will insist on a "maxi" approach, but the sector is sensitive in some developing economics. The issue is often a stumbling block among diverse economies.
E-commerce		Yes	Ensure free flow of information across borders; prohibit tariffs on e-commerce; facilitate cross-border supply of services; protect confidentiality of information	Issues involving regulation of information flow may be of concern to some economies.
Telecom-munications		Yes	Ensure interconnection and nondiscriminatory access to telecommunications networks; eliminate investment limits; limit require technology neutrality; promote mutual recognition in testing and certification	Principles uncontroversial, but some economies will want to maintain limitations on investment and competition, and on the development of standards.
Agriculture	9	No	Regulate tariff-quotas; bar export subsidies; disciplines on export taxes and restrictions; limit safeguards to applied MFN duties; provide for consultations on improving market access for specific products.	Controversial for a few products such as sugar and dairy. Many TPP economies are net exporters but some want exceptions. The compromise will have implications for future accession by countries such as Canada and Japan.
Labor	9	Yes	Incorporate ILO obligations; require domestic laws to be consistent with international standards; may require enforcement; authorize joint oversight committees.	Highly controversial; developed countries seek labor practices that are difficult to adopt and may impede competitiveness in low-income countries. Compromises will be needed.

Environment	9	Yes	Require laws for environmental protection and effective remedies for violations; ensure public participation; encourage technological cooperation; authorize joint committees.	Developed economies seek higher environmental standards than some developing economies; the latter want safeguards against "environmental protectionism."
Safety standards	3	Yes	Require regulation of products and services to ensure safety.	Advanced economies are pushing for "best practices;" emerging economies seek *de minimis* rules.
Regulatory coherence		Yes	Require regulations to be developed in an open, transparent process; require national treatment.	Objectives are relatively uncontroversial, but implementation has little precedent.
Small and medium size enterprises	3	Yes	Promote joint strategies to support SMEs; facilitate capacity building and the dissemination of information.	Relatively uncontroversial; opportunity to support capacity-building in low-income economies.
Business facilitation	0	Yes	Provide for cooperation in trade and investment promotion, customs clearance, inspections and quarantine; create joint working groups.	Relatively uncontroversial; opportunity to support capacity-building in low-income economies.
Culture	0	Yes	Promote cultural cooperation; regulate limits on imports of movies and other cultural products.	Controversial provisions may affect import restrictions on movies, music and other cultural products.
Science and technology	0	Yes	Provide for joint work and technology transfer in critical industries such information technology and mining.	Relatively uncontroversial.

Source: authors.

and perhaps intra-country income distributions. For example, a strict IPR regime could make health care and entertainment products and services more expensive in some economies. Second, several parties are said to be advocating rules to ensure "competitive neutrality" for state-owned enterprises (SOEs). The objective is to prevent SOEs from receiving support in the form of regulatory and tax advantages, or access to capital and other inputs at below-market prices. Although the proposed rules are not yet public, some observers are concerned that TPP disciplines will be so tough as to preclude future Chinese accession. In any case, the terms will have to be acceptable to Vietnam, which has a large state enterprise sector.

Third, several countries are said to favor "investor-state arbitration" provisions for issues involving foreign investments. Such agreements, which allow companies to challenge government rulings in international tribunals, are included in hundreds of bilateral investment treaties. Nevertheless, some NGOs and governments believe that including the proposal in the TPP would have a "chilling effect" on national regulation of products and services (Productivity Commission 2010).

Fourth, the United States has apparently suggested labor provisions that include enforceable adherence to ILO core labor standards. Standards related to rights of association and collective bargaining may be difficult to reconcile with some political systems. Tough labor provisions will complicate negotiations with Vietnam, but more importantly could make it harder to consolidate the TPP and Asian tracks in the future.

These flash points reflect mainly differences between more- and less-advanced economies. There are ways to bridge gaps and an agreement should be achievable, given high-level political support. Interestingly, the TPP is relatively free of one thorny problem that confronts many negotiations: most TPP9 economies are net agricultural exporters or have little domestic agriculture.[5] Thus, the divisive issue of agricultural protection should play a minor role in the negotiations, except for isolated problems such as U.S. sensitivities on sugar and dairy products. However, strict provisions on agriculture could make future enlargements difficult.

It is impossible to predict how various difficult issues will be resolved, but the TPP is likely to be more comprehensive and deeper than most other regional efforts, comparable to or perhaps exceeding the ambition of past U.S. bilateral agreements. It is likely to have stricter disciplines on goods and especially services trade than agreements on the Asian track, as well as wider provisions to address political concerns in advanced and developing countries. These expectations will be represented in our simulations by deeper cuts in parameters such as tariffs and non-tariff barriers.

Conducting negotiations in a (relatively) congenial setting also has disadvantages. Concentrated pressures from business groups could shape the provisions of the agreement in the absence of pushback from large economies with opposite interests. To alleviate these concerns, the negotiating group has held informal consultations with countries not involved in the negotiations and organized "stakeholders' forums" to give interested parties access to the negotiators. Once a framework agreement is achieved, broader discussions in APEC could also help to influence the shape of the final agreement. Much public debate is sure to follow.

In sum, while the provisions of the TPP are still evolving, its two objectives—a high quality agreement and Pacific-wide integration—tend to work at cross-purposes. The stricter the provisions and the more closely they are tailored to the interests of the negotiators, the more difficult it will be to bring in new members. This is a complicated tradeoff; it is not unusual for commentators to argue simultaneously for a "gold standard" agreement that limits behind-the-border barriers, and for terms that allow many economies to join. Negotiators on the TPP and Asian tracks are under pressure from many directions; they will need to find subtle compromises between undesirable extremes.

4. Baseline and alternative integration scenarios

The core of this study is a quantitative analysis of Trans-Pacific and Asian integration over 2010-2025. We attempt to construct estimates that are as realistic as possible—we incorporate the full range of effects suggested by recent empirical research on international trade; we use detailed and realistic assumptions about the liberalization effects of trade agreements; and we evaluate effects in the context of likely changes in the world economy over time. These factors sometimes work in opposite directions—the broad scope of our model and incorporating economic growth tend to

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[5] The United States, Australia, New Zealand, Chile and Vietnam are net agricultural exporters, and Singapore and Brunei have tiny agricultural sectors and have essentially free trade in agriculture. Perù is a net importer of agricultural goods but only marginally so; in 2007 exports were $2.0 billion and imports $2.3 billion (*FAO Statistical Yearbook).*

magnify estimated effects, while using detailed assumptions about the removal of trade barriers tends to moderate them. (For example, in contrast to most other studies, we assume that the details of negotiations and the implementation process result in much less than the full elimination of bilateral trade barriers.)

We begin by reviewing general assumptions about the evolution of the global economy in that period (the baseline scenario) and then explore alternative integration scenarios. The main variables analyzed include economic welfare, trade, job shifts, and the relative roles of trade creation and trade diversion. Section 6 examines the strategic implications of integration on the different tracks, while Section 7 discusses the choices of key economies.

Approach

The simulations are conducted with an advanced, 18-sector, 24-region (as listed in Annex Tables I-1 and I-2) computable general equilibrium (CGE) model of the world economy. The model was developed by Zhai (2008) and incorporates state-of-the-art trade theory; it tracks not only the usual specialization effects, but also possibilities for increasing varieties of goods and services, and for shifting resources among firms with heterogeneous productivity within each sector. The model has been previously applied to Asia-Pacific economic integration in studies of the ASEAN Economic Community (Petri et al. 2011, Plummer and Yue 2011) and the long-term prospects of ASEAN, China and India. The data are based on a preliminary version of Release 8 of the GTAP dataset, which includes information to 2007. This database is elaborated with aggregate economic data and projections from other sources, and with new data on the structure of protection in Asia-Pacific trade agreements. The model is described in Annex I and key protection parameters are derived in Annex II.

We are not aware of previous quantitative assessments of the TPP, but several studies have modeled the effects of Asian agreements and the FTAAP.[6] Since many of these agreements are still hypothetical, studies tend to use very simple assumptions, such as the full elimination of intra-agreement tariffs and arbitrary (and generally large) cuts in non-tariff barriers. These assumptions are likely to overstate the benefits of "real" agreements that typically include compromises. The Australian Productivity Commission has been especially critical of such efforts, arguing that "the results of modelling in feasibility studies are used to 'oversell' the benefits of agreements, while typically the actual text of agreements is not subject to assessment"[7] (Productivity Commission 2010, p. xxix). The Commission recommended multiple scenarios of agreements, transparency of assumptions, and attention to agreement detail.[8] We adopt these guidelines and develop conservative, data-based assumptions for reductions in barriers. To be sure, since the agreements considered are only in discussion or negotiation, estimates have to be used, but these are based on actual (and hopefully similar) past agreements rather than expectations that are unlikely to be achieved.

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[6] These studies include APEC (2009), Kawai and Wignaraja (2010), Kawasaki (2010), Park (2006), Park et al. (2010), Petri (1997), Scollay and Gilbert (2000).

[7] The United States does conduct a detailed assessment of the texts of proposed agreements by the U.S. International Trade Commission (USITC), such as the assessment of the U.S.-Korea FTA by USITC (2010). The analysis is provided only after an agreement is completed, in preparation for its consideration by Congress.

[8] It also recommended that an independent body oversee feasibility studies of future Australian negotiations.

Most CGE analyses of trade agreements analyze consequences in terms of a single historical data point, typically the most recent year available for the GTAP model (currently 2007). Welfare and trade effects are then calculated in comparative statics terms, that is, by finding an alternative equilibrium that would have prevailed in the base year had the agreement been fully implemented then, along with all relevant structural adjustments. The results are expressed in percentage terms, under the assumption that ratios will remain stable across the economic changes that are likely to occur over the time required to implement an agreement.

This study adopts a more fine-grained approach; we construct a detailed, annual baseline path and simulate agreements by introducing parameter changes in every year of the path. This methodology is more data- and computation-intensive, but makes it possible to examine changes along the path and assess issues such as the sequencing of policies and the adjustment implications of an agreement. The approach also accounts for growth and structural change in the world economy, including changes in the composition of output, employment and trade, as well as trade agreements that are scheduled to take effect but are not yet reflected in the data.

Baseline

The GDP levels of the model's 24 countries and regions are calibrated to IMF projections up through 2015 and then to CEPII (Foure et al. 2011) projections until 2025. CEPII uses growth models estimated on historical labor, capital and energy data and projects these forward with time-series forecasts of productivity growth, savings rates and capital accumulation. Their results are similar to those of other recent projection exercises. Of course, any such long-term path is speculative, and at this writing the initial years of the path look too optimistic. In any case, our main interest is in deviations from the baseline that are generated by alternative simulations. Section 8 reports sensitivity analyses of these deviations by varying assumptions about the structure of the model. Such structural variations are likely to have greater (and less obvious) implications for the results than changes in the GDP path itself.

Baseline results for GDP and exports are shown in Tables 2 and 3, respectively, with economies grouped by whether we expect them to participate (i) only in the Trans-Pacific integration track, (ii) only in the Asian integration track, (iii) in both tracks, and (iv) in neither track except for the FTAAP. We use this reporting format to distinguish among countries that will be differently affected by the Asian and TPP integration scenarios. We also report results for conventional groups including ASEAN+3 and APEC.

The world economy will be substantially larger in 2025 than it is today, with GDP expanding by 75% (Table 2) and world trade growing by 88% (Table 3). Anticipating this transformation, even if imperfectly, provides context for assessing trade agreements that will be implemented over a long period. For example, our projections (as others) point to a rough doubling of the role of China in world output and nearly as much increase in its trade. By 2025, the United States, Europe and China will have roughly similar-sized economies. The baseline also shows the GDP of "Asian track" economies growing fastest at an annual rate of more than 8%. ASEAN+3 will grow more slowly—but still at an impressive rate of nearly 6%—since it includes mature Japan. APEC, with several advanced-economy members, will grow at a 4.2% rate while its share of world GDP will increase from 54% in 2010 to 57% in 2025.

Table 2. Baseline projections of GDP

	GDP (USD2007bill.)				2010-2025	Share of World GDP	
	2010	2015	2020	2025	Growth	2010	2025
TPP track economies	17,840	20,576	23,410	26,550	2.7	30.7	26.0
United States	14,049	16,035	18,088	20,337	2.5	24.1	19.9
Australia	918	1,074	1,242	1,426	3.0	1.6	1.4
Canada	1,421	1,615	1,794	1,982	2.2	2.4	1.9
Chile	159	197	240	289	4.1	0.3	0.3
Mexico	1,024	1,317	1,628	1,999	4.6	1.8	2.0
New Zealand	138	160	182	206	2.7	0.2	0.2
Peru	130	178	237	311	6.0	0.2	0.3
Asian track economies	5,982	9,391	14,045	19,540	8.2	10.3	19.2
China	4,811	7,858	11,999	16,834	8.7	8.3	16.5
Hong Kong	218	269	332	405	4.2	0.4	0.4
Indonesia	538	756	1,067	1,473	6.9	0.9	1.4
Philippines	157	191	241	308	4.6	0.3	0.3
Thailand	258	318	407	520	4.8	0.4	0.5
Two-track economies	5,875	6,656	7,527	8,460	2.5	10.1	8.3
Brunei	13	15	18	22	3.3	0.0	0.0
Japan	4,245	4,627	4,999	5,332	1.5	7.3	5.2
Korea	1,131	1,387	1,695	2,063	4.1	1.9	2.0
Malaysia	200	256	330	422	5.1	0.3	0.4
Singapore	200	253	316	386	4.5	0.3	0.4
Vietnam	86	118	169	235	7.0	0.1	0.2
Others	28,505	33,741	40,011	47,418	3.5	49.0	46.5
Russia	1,323	1,713	2,202	2,790	5.1	2.3	2.7
Chinese Taipei	417	519	651	800	4.4	0.7	0.8
Europe	16,625	18,433	20,320	22,237	2.0	28.6	21.8
India	1,554	2,401	3,608	5,229	8.4	2.7	5.1
Other ASEAN	33	44	60	82	6.2	0.1	0.1
ROW	8,552	10,631	13,168	16,280	4.4	14.7	16.0
WORLD	**58,201**	**70,364**	**84,993**	**101,967**	3.8	100.0	100.0
Memorandum							
TPP9	15,893	18,287	20,821	23,634	2.7	27.3	23.2
ASEAN+3	11,890	16,091	21,632	28,081	5.9	20.4	27.5
APEC	31,436	38,856	47,836	58,140	4.2	54.0	57.0

Source: IMF, CEPII and authors' estimates. GBL 17sep/tables

Table 3. Baseline projections of exports

	Exports (USD2007bill.)				2010-2025	Share of World Exports	
	2010	2015	2020	2025	Growth	2010	2025
TPP track economies	**2,573.2**	**3,214.7**	**3,859.6**	**4,611.8**	4.0	17.6	16.7
United States	1,561.4	1,959.1	2,369.4	2,845.0	4.1	10.7	10.3
Australia	176.5	223.0	272.2	328.4	4.2	1.2	1.2
Canada	425.6	482.9	545.2	613.2	2.5	2.9	2.2
Chile	69.3	97.8	124.4	156.8	5.6	0.5	0.6
Mexico	271.2	357.8	428.8	519.1	4.4	1.9	1.9
New Zealand	33.6	41.1	48.8	57.0	3.6	0.2	0.2
Peru	35.7	52.9	70.8	92.3	6.5	0.2	0.3
Asian track economies	**2,219.3**	**3,260.5**	**4,520.1**	**6,060.1**	6.9	15.1	22.0
China	1,638.5	2,420.2	3,468.4	4,744.0	7.3	11.2	17.2
Hong Kong	135.0	179.0	206.6	235.3	3.8	0.9	0.9
Indonesia	172.4	266.4	362.4	488.4	7.2	1.2	1.8
Philippines	74.5	113.0	128.1	147.7	4.7	0.5	0.5
Thailand	198.8	281.9	354.5	444.7	5.5	1.4	1.6
Two-track economies	**1,673.2**	**2,122.0**	**2,399.8**	**2,698.2**	3.2	11.4	9.8
Brunei	3.8	5.3	6.8	8.9	5.7	0.0	0.0
Japan	818.0	999.3	1,119.0	1,238.5	2.8	5.6	4.5
Korea	386.9	517.6	574.4	627.4	3.3	2.6	2.3
Malaysia	185.9	252.8	287.7	327.9	3.9	1.3	1.2
Singapore	204.8	228.1	231.7	231.8	0.8	1.4	0.8
Vietnam	73.6	119.0	180.2	263.8	8.9	0.5	1.0
Others	**8,190.9**	**10,017.3**	**11,889.3**	**14,203.6**	3.7	55.9	51.5
Russia	369.1	610.3	850.9	1,163.3	8.0	2.5	4.2
Chinese Taipei	278.3	402.8	497.0	606.7	5.3	1.9	2.2
Europe	4,762.7	5,258.8	5,712.8	6,184.0	1.8	32.5	22.4
India	211.2	346.1	559.4	896.4	10.1	1.4	3.3
Other ASEAN	11.6	18.1	24.2	31.8	6.9	0.1	0.1
ROW	2,558.0	3,381.2	4,245.0	5,321.3	5.0	17.5	19.3
WORLD	**14,656.6**	**18,614.6**	**22,668.7**	**27,573.7**	4.3	100.0	100.0
Memorandum							
TPP9	2,345	2,979	3,592	4,312	4.1	16.0	15.6
ASEAN+3	3,904	5,401	6,944	8,790	5.6	26.6	31.9
APEC	7,113	9,610	12,127	15,140	5.2	48.5	54.9

Source: IMF, CEPII and authors' estimates. GBL 17sep/tables

The baseline projection includes the effect of all trade agreements that had been signed by 2010 but were not yet fully implemented in 2007, the year of our database (Table 4). To assess the effect of these anticipated changes, we ran the baseline scenario with and without the implementation of pending trade agreements. The results suggest that agreements in the pipeline will boost the world economy by amounts ranging from $42 billion in 2015 to $93 billion by 2025.[9] (These and all other benefits reported in this study are real annual gains in 2007 U.S. dollars.) The effects will be greatest for the ASEAN Economic Community (AEC) initiative; members can expect gains from one to four percent of GDP (see also Petri et al. 2011). Other significant agreements in progress include the Economic Cooperation Framework Agreement between China and Chinese Taipei and the Korea-U.S. Free Trade Agreement (KORUS).

For the United States, the welfare gains from agreements in progress are around $4 billion in 2025, reflecting the positive effects of KORUS[10] and some trade losses in agreements in which the United States does not participate. For China, welfare gains will be under $2 billion in 2025. Although China benefits somewhat from its agreements-in-progress with ASEAN, it also likely to suffer some modest diversion of exports to the United States in favor of Korea. In sum, the pipeline of existing Asia-Pacific agreements will yield some integration gains mainly to the region's smaller economies (including ASEAN, Korea, and Chinese Taipei), but neither the United States nor China will be important beneficiaries.

Scenarios

We organize prospective trade agreements into Trans-Pacific and Asian tracks, with each progressing through multiple stages of enlargement.[11] While the pace of progress on each track is uncertain, the results suggest that the directions are compelling. The structure of the tracks is supported by the incentives countries face as the paths evolve. The two-track approach avoids a flat comparison of many alternatives, focusing instead on "incentive-consistent" paths.

The tracks are illustrated in Figure 2. Each track assumes ambitious steps; we are attempting to evaluate the implications of aggressive policy changes rather than to predict probable outcomes. We also assume rapid implementation of each agreement in order to capture full effects, including adjustment implications, in a plausible time frame. In other words, the scenarios represent vigorous, "front loaded" progress on each track.

The *Trans-Pacific track* builds on the existing P4 agreement and bilateral agreements connecting several pairs of potential members. The first new step, assumed to be signed in 2012 and implemented by 2015, would be the completion of the current 9-country TPP negotiation (TPP9). The next step would add other NAFTA economies (Canada and Mexico) and Japan and Korea. We assume that this would be agreed in 2015 and implemented by 2020. Thus, by 2020 the track would have a 13-member group that includes several large, trade-oriented economies (TPP13).

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[9] These results are from not included in table from; further detail is available on request from the authors.

[10] This value is close to the welfare gains estimated by USITC (2010).

[11] Economists concerned with enlargement emphasize making agreements open through automatic accession criteria. In practice, accession usually involves some new negotiations and sometimes even the substitution of a new agreement for an old one. This is what happened when the Canada-U.S. FTA was expanded into NAFTA and is also what appears to be happening now with the conversion of the P4 agreement into the TPP.

Table 4. Asia-Pacific trade agreements

	Agreement	Member type	Intra-regional exports		Years	
			2010 2007$bill.	% of 2010 total	Signed	Imple-mented
1	Australia-New Zealand	Asia	15.7	7.5	1983	1983
2	Canada-US	T-P	593.3	29.9	1988	1989
3	AFTA	Asia	171.7	18.5	1992	1993
4	NAFTA	T-P	951.6	42.1	1992	1994
5	New Zealand-Singapore	Asia	1.2	0.5	2000	2001
6	Japan-Singapore	Asia	24.0	2.3	2002	2002
7	China-Hong Kong	Asia	85.4	4.8	2003	2004
8	US-Singapore	T-P	54.8	3.1	2003	2004
9	Australia-Singapore	Asia	7.8	2.1	2003	2003
10	US-Chile	T-P	21.0	1.3	2003	2004
11	Korea-Chile	T-P	5.9	1.3	2003	2004
12	ASEAN-China	Asia	455.0	17.7	2004	2005
13	Australia-US	T-P	53.1	3.1	2004	2005
14	Australia-Thailand	Asia	13.5	3.6	2004	2005
15	P4	T-P	2.5	0.8	2005	2006
16	New Zealand-Thailand	Asia	1.6	0.7	2005	2005
17	Korea-Singapore	Asia	15.6	2.6	2005	2006
18	Japan-Malaysia	Asia	35.2	3.5	2005	2006
19	China-Chile	T-P	25.1	1.5	2005	2006
20	ASEAN-Korea	Asia	245.1	18.7	2006	2007
21	Japan-Philippines	Asia	26.5	3.0	2006	2008
22	Japan-Thailand	Asia	58.3	5.7	2007	2007
23	Japan-Indonesia	Asia	41.1	4.1	2007	2008
24	Japan-Brunei	Asia	0.8	0.1	2007	2008
25	Japan-Chile	T-P	11.7	1.3	2007	2007
26	ASEAN EC	Asia	171.7	18.5	2007	2008
27	ASEAN-Japan	Asia	377.1	21.6	2008	2008
28	New Zealand-China	Asia	8.7	0.5	2008	2008
29	China-Singapore	Asia	1.5	0.1	2008	2009
30	Australia-Chile	T-P	0.7	0.3	2008	2009
31	Singapore-Peru	T-P	0.2	0.1	2008	2009
32	ASEAN-ANZ	Asia	240.3	21.2	2009	2010
33	Malaysia-New Zealand	Asia	1.4	0.6	2009	2010
34	Japan- Mexico	T-P	16.7	1.5	2009	2009
35	China-Peru	T-P	9.3	0.6	2009	2010
36	New Zealand-Hong Kong	Asia	1.2	0.7	2010	2011
37	China-Chinese Taipei	Asia	160.9	8.4	2010	2010
38	Malaysia-Chile	T-P	0.3	0.1	2010	2011
39	KORUS (expected)	T-P	101.9	5.2	2011	2012

Source: ESCAP and authors' estimates. wtf/table

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Figure 2. Schematics of Asian and TPP tracks
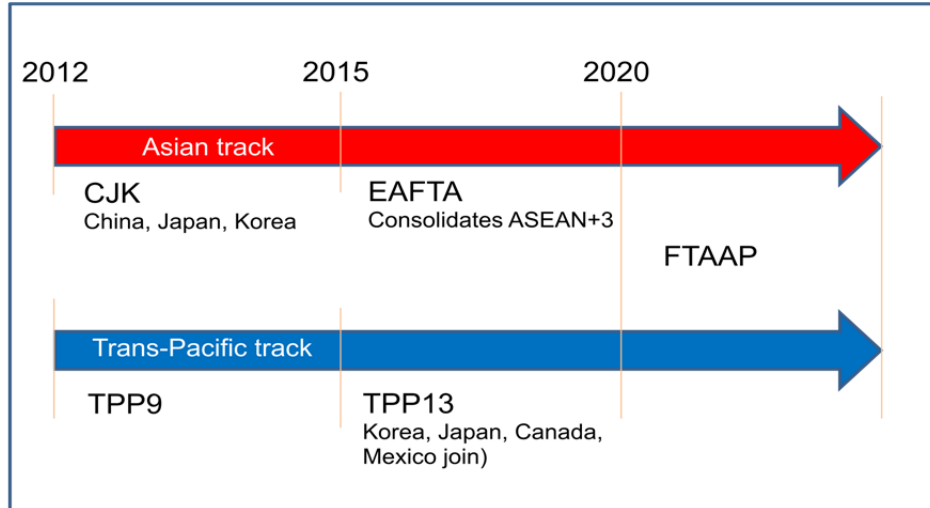
Source: authors.

The *Asian track* builds on ASEAN integration efforts, including the ASEAN Economic Community Blueprint, and bilateral trade agreements with China, Japan and Korea. These agreements cover a large amount of trade, but include fewer areas of agreement and allow wider exceptions than FTAs on the Trans-Pacific track. Moreover, the three largest economies are not connected by any agreement so far, although a potential China-Japan-Korea (CJK) accord is under study. The three countries agreed to accelerate the study in order to start negotiations in 2012.

As the first new step, we assume that a CJK agreement will be signed in 2012 and implemented by 2015. The second step, which we assume will be agreed by 2015 and implemented by 2020, is to integrate the CJK and ASEAN agreements into the EAFTA.[12] Although the EAFTA would not generate significant new bilateral liberalization given the existing web of accords, it would consolidate provisions and allow region-wide cumulation of rules of origin. In our modeling, this would yield additional trade and welfare gains. To be sure, there is much uncertainty about how rapidly progress can be made in the Asian track (Zhiming 2011). Negotiations have not yet started and there are few precedents, such as the established P4, to guide them.

We then examine how the tracks could become *pathways to the FTAAP*. The FTAAP is assumed to include all economies on the two tracks plus Russia and Chinese Taipei.[13] Each track is illustrated in Figure 3, with circles with areas proportional to each group's intra-regional trade in 2010. The Trans-Pacific track starts from a tiny circle (the P4), but expands rapidly with intra-regional trade in the TPP13 reaching 41% of total trade. The Asian track begins with a larger ASEAN, but even with enlargement into the EAFTA it only covers 24% of the total trade in the region; much of the group's exports cross the Pacific, especially to North America.

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[12] It is possible that the track would lead to the CEPEA (ASEAN+6) framework instead. To simplify this discussion, we explore only the EAFTA, but later examine the effects of adding India to the FTAAP.

[13] These two economies are APEC members that are not involved in either TPP or Asian track agreements. It is also convenient to assume that the small "other ASEAN" economies (Cambodia, Lao and Myanmar) will be ultimately included in the FTAAP, although they are not currently members of APEC.

Figure 3. TPP and Asian pathways to the FTAAP

TPP track

Asian track

FTAAP

TPP13

TPP9

P4

FTAAP

EAFTA

AEC, CJK

AEC
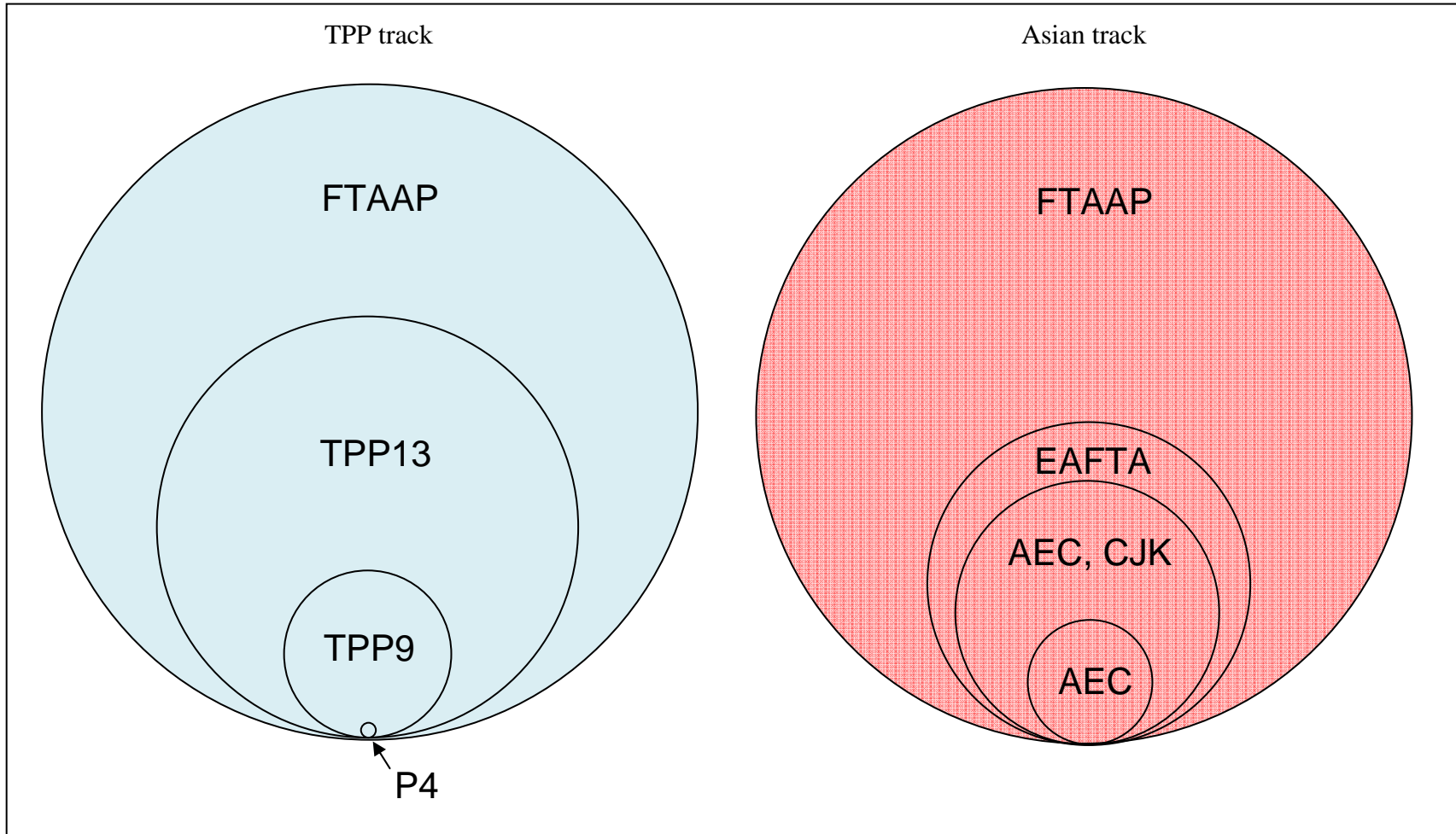
Source: authors.

Even though the Asian track covers less trade than the Trans-Pacific track, and it is likely to apply less rigorous rules, it will turn out to yield larger incremental welfare benefits than the TPP track. This is because much of TPP trade is already free as a result of existing agreements, including the large NAFTA agreement. Moreover, Asian track economies will generally grow faster than those on the TPP track. Of course, all this could also mean that the Asian track will be more difficult to develop and/or will have to converge to weaker disciplines.

The provisions of the FTAAP are assumed to depend on the pathway used to reach it—depending on the agreements that exist when the negotiations begin, its template could be based on the TPP, on the EAFTA, or a combination of the two. The agreement could be also developed from scratch if neither track exists (in this case we assume a template like the one that would have been reached had both tracks existed). This last option—"virgin birth" of the FTAAP—is unlikely, but provides a useful benchmark for analyzing the TPP and Asian pathways. All four pathways are assumed to lead to an agreement in 2020 and full implementation by 2025.

In addition to these scenarios, we examine some variations on each track. For example, we study the implications of Japan joining the TPP in the first round rather than the second and TPP variants that provide for exceptions for sensitive products. The scenarios computed so far are summarized in Table 5.

Parameters

The TPP and Asian tracks are represented in our study by sequences of trade agreements, as illustrated in Figure 2. In these sequences, agreements are modeled with parameter changes that affect four dimensions of the protection structure of participating economies:[14]
- Tariffs
- Utilization rates of tariff preferences
- Non-tariff barriers
- Costs associated with meeting rules of origin

Changes in these key protection parameters are summarized in Table 6. The methodology used to derive the effects of various agreements is explained in Annex II.

For modeling purposes, the tariff reduction applied to trade flows is the product of the first two parameters, the reduction in preferential tariffs and the utilization rate of preferences. Data suggest that utilization rates are well below unity (Kawai and Wignaraja, 2011). Research on the determinants of utilization is in its early stages, but low rates of utilization apparently reflect complicated reporting requirements, low margins of preference over MFN tariffs, and small regions that exclude low-cost suppliers. Based on these findings, we model the utilization rates reported in Table 6 as a function of the size of tariff preferences and the size of agreements. Since the agreements contemplated are large and in some cases affect significant barriers, the projected utilization rates are relatively high (ranging from 53% to 71%). Further detail on the calculations is reported in Annex II.

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[14] Analysis of the agreements also provides information for building scenarios of changes in foreign direct investment flows, but those effects will be analyzed in a future stage of the study.

Non-tariff barriers (NTBs) are introduced as tariff equivalents that result in higher costs for domestic goods and services. These are modeled as "iceberg costs," that is, as reductions in productivity. We also associate productivity losses with the utilization of preferential trade agreements under rules of origin (ROO), since strict ROO provisions may induce the substitution of less efficient domestic or regional inputs for more efficient inputs from partners outside an FTA.

Table 5. Summary of scenarios

No.	Objective	Description	Parameter Changes
0	Baseline	IMF/CEPII growth; implementation of agreed FTAs	Tariff and NTB changes as scheduled
1	TPP track	TPP9 agreement and subsequent enlargement to TPP13	Tariff and NTB changes similar to those of prior agreements among TPP members; greater utilization of prior preferences due to cumulation of ROOs
2	Asian track	CJK agreement and subsequent consolidation of all ASEAN+3 agreements into single EAFTA	Tariff and NTB changes similar to those of prior agreements among CJK members; consolidation of ASEAN-plus-one and CJK agreements generates greater utilization of prior preferences due to cumulation of ROOs
3	FTAAP from TPP track	Enlargement of TPP13 to cover all 21 APEC economies	Tariff and NTB reductions similar to TPP track; greater utilization of prior preferences due to cumulation of ROOs
4	FTAAP from Asian track	Enlargement of EAFTA to cover all 21 APEC economies	Tariff and NTB reductions similar to Asian track; greater utilization of prior preferences due to cumulation of ROOs
5	FTAAP from both tracks	Enlargement of EAFTA to cover all 21 APEC economies	Tariff and NTB reductions at average of TPP and Asian tracks; greater utilization of prior preferences due to cumulation of ROOs
6	FTAAP from baseline	FTA among 21 APEC economies without prior agreements	Tariff and NTB reductions as in FTAAP from both tracks
7	TPP track with Japan accelerated	Japan joins TPP in the first rather than second round	Similar to TPP track; Japan liberalization implemented by 2015
8	TPP track with exceptions	Lower reductions in protection in sensitive industries	Similar to TPP track with early Japanese liberalization; reductions moderated in each country's 3 most sensitive sectors
9	Standstill	Similar to baseline, but no implementation of FTAs	Tariff and NTBs held at 2010 levels

Source: authors.

Table 6. Assumptions about prospective agreements

Agreement	Signed	Imple-mented	Intra-regional exports		Preference utilization rate	Reductions			
			2010 2007$bill.	% of 2010 total		Final tariffs	Goods NTBs	Service NTBs	FDI Barriers
TPP9	2012	2015	311	13.3	0.53	0.93	0.51	0.56	0.59
TPP10	2012	2015	676	21.4	0.61	0.93	0.51	0.56	0.59
TPP13	2015	2020	1,977	46.6	0.63	0.93	0.51	0.56	0.59
CJK	2012	2015	607	21.3	0.63	0.91	0.35	0.33	0.35
EAFTA	2015	2020	1,169	32.5	0.63	0.91	0.35	0.33	0.35
Baseline > FTAAP	2020	2025	4,797	67.3	0.71	0.92	0.43	0.45	0.47
TPP track > FTAAP	2020	2025	4,797	67.3	0.71	0.93	0.51	0.56	0.59
Asia track > FTAAP	2020	2025	4,797	67.3	0.71	0.91	0.35	0.33	0.35
Dual track > FTAAP	2020	2025	4,797	67.3	0.71	0.92	0.43	0.45	0.47
FTAAP with India	2020	2025	5,023	68.5	0.71	0.92	0.43	0.45	0.47

Source: authors' estimates. simdata/T-pol

Given the complex pattern of Asia-Pacific trade agreements, a bilateral trade flow may be covered by multiple FTAs. For example, Japanese trade with Malaysia is already covered in the baseline scenario by a general agreement between Japan and ASEAN as well as a bilateral agreement between Japan and Malaysia. On the Asian track, the same trade flow would be eventually covered by the EAFTA. And it would be also covered on the TPP track when Japan joins. In such cases, the protection level used to model a bilateral flow is the lowest available among applicable agreements.

Although the parameter changes are explained in Annex II, it is useful to summarize the approach. The methodology is straight-forward for tariffs, since agreements typically specify schedules of tariff cuts (although extracting these and converting them into appropriate aggregates required considerable effort). The methodology for changing utilization rates and NTBs is more complex; it relies on "scoring" the content of agreements. The approach is similar to that used by Findlay and Urata (2010) to analyze Asia-Pacific trade agreements and uses some of their results.

We assign quantitative scores to the coverage of past agreements in each issue area. The score is based on whether the coverage of the topic was substantial (a chapter), modest (a section), or minimal (little or no mention), and whether the agreement covered advanced economies, emerging economies, or a mix. We then construct "policy impact coefficients" to map coverage scores into impacts on the protection structure. For example, the ASEAN-Australia-New Zealand Free Trade Agreement had an intermediate degree of coverage of service-related topics (10 of the 24 topics were judged to affect service trade). Applying the scoring formulas, we estimate that the agreement would reduce service NTBs by 41% (out of a maximum of 67% assumed to be accessible to policy). Although the approach incorporates inevitably arbitrary assumptions, it provides a common, transparent way for quantifying the voluminous detail of actual agreements.

This methodology cannot be applied to future agreements, since their coverage is not yet known. We therefore estimate scores for future agreements from the average scores of past agreements in which the same key parties were involved. For example, the scores of the TPP track reflect the

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average scores of 5 past U.S. agreements and the P4 agreement. The CJK agreement, in turn, reflects average scores of past agreements by China, Japan and Korea. Using this approach we estimate, for example, that services will be covered intensively in the TPP9 leading to a 56% reduction in service NTBs, and lightly in the CJK leading to a 33% reduction. These and additional results are also shown in Table 6.

Extending this approach, we assume that each track will carry its protection structure forward into a possible region-wide agreement. For an FTAAP reached from both tracks, we use scores half-way between the two tracks. This process guesses the outcome of future negotiations between the tracks; we assume equal weights, but of course other weights could emerge depending on which track has more leverage at that time.

5. Welfare and trade on alternative tracks

We begin by reviewing broad welfare and trade effects of the scenarios and then drill deeper into selected country- and sector-specific results. One objective is to assess the economic impact of the agreements; another is to understand their effects on the interests of different countries and groups within them. Strategic implications will be further examined in the next section.

Two characteristics of such welfare analysis are worth noting. First, the results reflect incremental changes in policy, so the benefits of liberalizing already open economies (and trade flows already subject to free trade agreements) tend to be small. Second, the largest share of the gains from liberalization, especially for relatively protected economies, accrue to the liberalizing (home) economy rather than its partners; liberalization generally raises the productivity of home resources.

One limitation of this analysis is that it does not address the effects of the tracks on foreign direct (FDI) investment. Various provisions in the agreements are intended to reduce barriers to FDI. Other studies of similar effects have found significant welfare gains (Petri 1997 and Petri et al. 2011). Such estimates are left to future work.

Welfare implications

The contributions of the scenarios to economic welfare take shape slowly but eventually become significant. We measure benefits using the standard "equivalent variations" (EV) approach, which identifies the income required, at fixed prices but without an agreement, to match the real expenditures changes that result from an agreement. We report welfare effects as annual dollar gains, and also as annual percentage gains relative to the baseline GDP in that year.

The real expenditure change measured by the EV approach is due to changes in real output (productivity), the terms of trade (the relative value of output at international prices), and product variety (expanded international alternatives). Over time, the EV measure also incorporates output changes due to changes in the capital stock, as income and investment change along the simulated growth path. In principle, employment levels could be also affected by the simulations, but we

keep them fixed. With slowly implemented, long-term policy changes, we have no reason to assume anything but full employment along each scenario.[15]

Welfare effects on the two tracks are shown in Figure 4 for the world as a whole. Characteristically, benefits start small because the initial agreements are small and implementation is gradual. In 2012, the TPP track generates global benefits of only $2 billion and the Asian track only $7 billion[16] (compared to world GDP of $63 trillion). Over time the benefits rise substantially, to $104 billion on the TPP track and $215 billion on the Asian track. The benefits are largely non-overlapping and total gains from both tracks are $303 billion, close to their sum.

Figure 4. World welfare on alternative tracks ($bill)
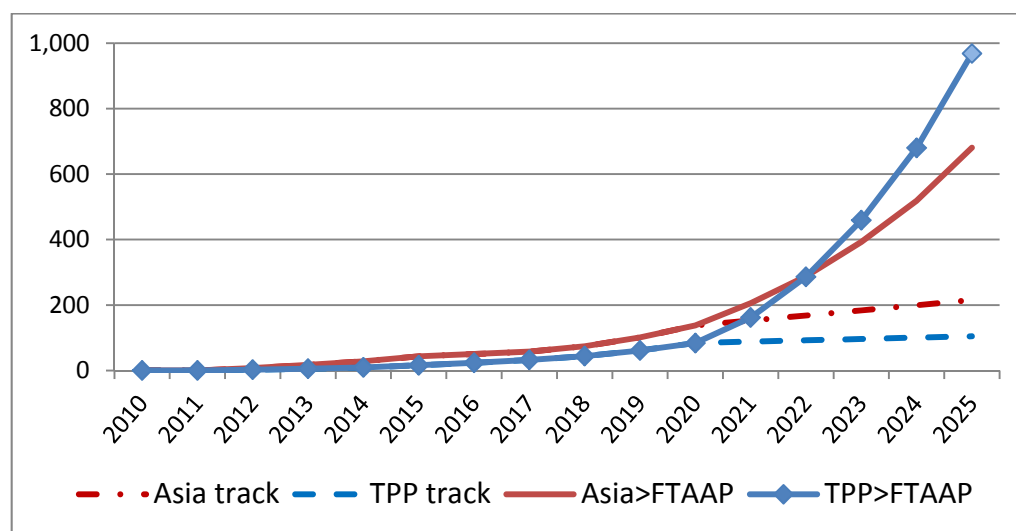
Source: authors' estimates. GBL 17sep/macro

Country and region detail is provided by Table 7. On the TPP track, Vietnam, Japan, Mexico and Korea as well as the United States eventually gain $10 billion or more. Korea benefits despite the fact that KORUS is already in the baseline, mainly due to markets not yet covered by its FTAs, including especially Japan's. As theory suggests, small economies gain the most in relative terms; New Zealand, Peru, Malaysia and Vietnam all show gains near or exceeding one percent of GDP.

On the Asian track, China, Japan and Korea are major beneficiaries. Their initial gains reflect access to each others' markets. Other Asian economies do not directly benefit at this early stage since they already have agreements with China, Japan and Korea. They do achieve new benefits in a second step, when the EAFTA creates region-wide rules of origin and induces greater utilization of preferential access.

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[15] This approach also assumes zero wage elasticities of labor supply. Effects on employment in the short run might be calculated to the extent that future underemployment can be predicted, but little of the impact of liberalization is likely to take effect in a short time frame.
[16] These results do not appear in Table 7, which identifies only the 2025 endpoint of the tracks.

Table 7. Welfare on alternative tracks

	GDP 2025	Welfare gains in 2025 (EV USD2007bill.)				% Baseline GDP			
	Baseline	TPP	Asian track	Two tracks	FTAAP	TPP	Asian track	Two tracks	FTAAP
TPP track economies	**26,550**	**40.8**	**6.7**	**46.6**	**134.8**	**0.15**	**0.03**	**0.18**	**0.51**
United States	20,337	13.9	3.2	16.5	62.9	0.07	0.02	0.08	0.31
Australia	1,426	2.4	0.1	2.6	7.9	0.17	0.01	0.18	0.55
Canada	1,982	2.3	0.4	2.6	7.3	0.12	0.02	0.13	0.37
Chile	289	2.3	0.1	2.4	5.0	0.78	0.04	0.82	1.72
Mexico	1,999	11.7	2.8	14.0	41.3	0.58	0.14	0.70	2.07
New Zealand	206	1.7	0.0	1.8	2.5	0.83	0.02	0.86	1.22
Peru	311	6.6	0.1	6.7	7.9	2.12	0.02	2.16	2.53
Asian track economies	**19,540**	**-19.2**	**120.1**	**103.8**	**387.3**	**-0.10**	**0.61**	**0.53**	**1.98**
China	16,834	-15.7	84.8	71.2	318.7	-0.09	0.50	0.42	1.89
Hong Kong	405	-0.1	15.1	15.0	24.7	-0.02	3.72	3.69	6.10
Indonesia	1,473	-1.5	8.1	7.0	17.3	-0.10	0.55	0.48	1.18
Philippines	308	-0.4	3.8	3.5	8.9	-0.12	1.25	1.15	2.90
Thailand	520	-1.4	8.3	7.1	17.6	-0.28	1.60	1.37	3.38
Two-track economies	**8,460**	**90.3**	**98.3**	**170.1**	**207.5**	**1.07**	**1.16**	**2.01**	**2.45**
Brunei	22	0.1	0.3	0.3	0.4	0.48	1.31	1.50	1.64
Japan	5,332	30.7	42.8	67.3	73.6	0.58	0.80	1.26	1.38
Korea	2,063	15.1	33.5	43.2	48.2	0.73	1.63	2.09	2.34
Malaysia	422	9.4	6.5	15.1	22.2	2.24	1.53	3.59	5.25
Singapore	386	1.4	0.0	0.8	1.6	0.35	-0.01	0.21	0.42
Vietnam	235	33.5	15.2	43.3	61.4	14.27	6.49	18.44	26.14
Others	**47,418**	**-7.7**	**-9.9**	**-17.1**	**132.6**	**-0.02**	**-0.02**	**-0.04**	**0.28**
Russia	2,790	-1.0	-1.3	-2.3	152.3	-0.03	-0.05	-0.08	5.46
Chinese Taipei	800	-1.6	-7.6	-8.4	30.2	-0.20	-0.95	-1.05	3.77
Europe	22,237	1.6	6.2	6.5	-2.3	0.01	0.03	0.03	-0.01
India	5,229	-0.6	-6.3	-6.8	-10.9	-0.01	-0.12	-0.13	-0.21
Other ASEAN	82	-0.2	0.5	0.3	1.7	-0.30	0.64	0.40	2.04
ROW	16,280	-5.9	-1.4	-6.6	-38.3	-0.04	-0.01	-0.04	-0.24
WORLD	**101,967**	**104.3**	**215.3**	**303.3**	**862.2**	**0.10**	**0.21**	**0.30**	**0.85**
Memorandum									
TPP9	23,634	71.3	25.5	89.5	171.7	0.30	0.11	0.38	0.73
ASEAN+3	28,081	70.9	219.0	274.2	596.4	0.25	0.78	0.98	2.12
APEC	58,140	109.4	216.2	309.8	912.0	0.19	0.37	0.53	1.57

Note: FTAAP is assumed to be reached from both tracks.

Source: authors' estimates. GBL 17sep/tables

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Economies that participate on both tracks are generally the biggest winners. The tracks appear to be different enough (due to differences in market access, including the markets of the United States and China; the structure of trade; and the terms of the agreements) to yield benefits that are nearly additive. "Two-track" economies capture 53% of the total benefits generated by the tracks, even though they account for only 16% of the GDP of all participating countries.

An eventual region-wide agreement—the FTAAP—would be much more productive than the tracks taken individually or together. The pathway used to reach the FTAAP matters. Figure 4 shows the effects of the TPP and Asian pathways, respectively. The TPP track initially yields lower benefits than the Asian track, but its more rigorous template would generate greater benefits when transformed into the FTAAP. Around 2022 its welfare effects would overtake those of the Asian track. These little-studied effects are explored in Section 6.

For example, if reached from both tracks, the FTAAP would generate $862 billion in benefits by 2025 (0.85% of world GDP), or $559 billion more than both tracks together. For comparison, estimates of the benefits generated by a Doha Round range from $87 billion to $574 billion in 2015 (Fergusson 2008). While the FTAAP would cover only about half as much trade as the Doha negotiations, it would likely involve more ambitious liberalization, especially in services.

In sum, the results confirm the criticism that the two tracks would have modest impact if stopped in their early stages. Yet over time, both tracks generate large gains, both for large economies and proportionally even more for small economies. Small and intermediate-sized economies may therefore emerge as the early engines of the negotiations, much as ASEAN has helped to create an Asian regional framework. The roles of Japan and Korea are interesting; their benefits are large and their decisions could disproportionately affect the sequence of agreements. Results for key countries will be examined in Section 7.

Trade implications

The two tracks of agreements would make even larger contributions to world trade[17] (Figure 5 and Table 8).   The effects would again start small: in 2012 when world trade is estimated to be $16 trillion, the TPP track generates additional trade of $5 billion and the Asian track $50 billion. But by 2025 the gains would become substantial; the TPP and Asian tracks generate increases of $222 billion and $574 billion in additional trade, respectively, and $742 billion together.

The trade covered by the TPP track is greater than that covered by the Asian track ($1,977 billion vs. $1,169 billion in 2010), yet both welfare and trade results suggest that TPP track would have only half as large an impact as agreements on the Asian track. The reason for this difference is that the TPP economies have relatively low barriers to start, and much of their trade is already covered by free trade agreements, including the large trade flows within North America. The incremental trade effects of the TPP are greatest for Vietnam, Japan, the United States, and Korea. On the Asian track, China gains most, but Japan and Korea also show substantial increases. Two-track economies would do best; when both tracks are implemented, their exports would increase by 14% compared to 6% for all participating economies.

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[17] We report exports only. Given that the scenarios assume fixed capital accounts balances, the effects of scenarios on export and import changes are similar.

Figure 5. World export increases on alternative tracks ($bill.)
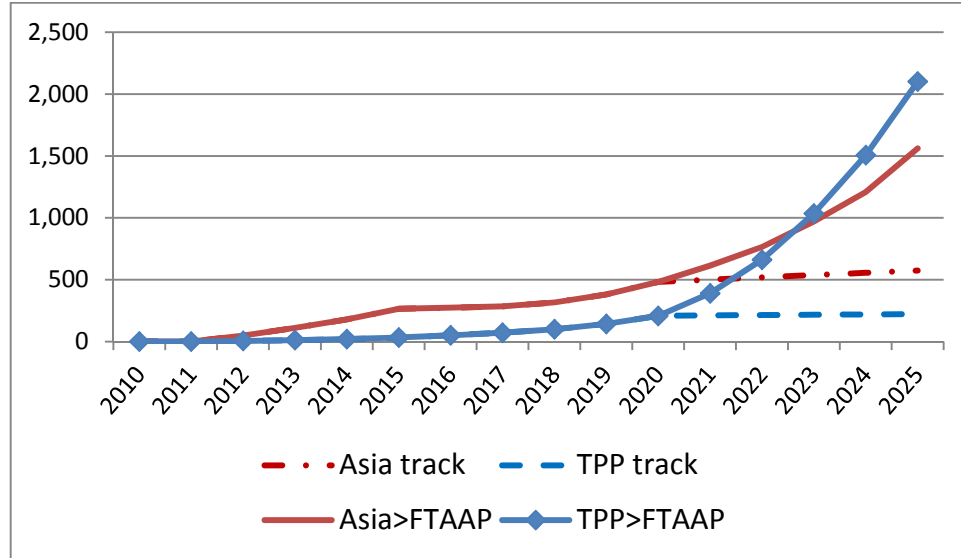
Source: authors estimates. GBL 17sep/macro

Region-wide integration dominates the trade results, with the FTAAP raising world trade by $1,824 billion (6.6%).   These are very large gains—as we already noted, similar in magnitude to those that might have resulted from the Doha Round. Asia-Pacific integration would increase the region's trade by more than twice as much as the TPP and Asian tracks together.

The product composition of trade is described by Table 9. The largest effects—three quarters of the export increase—are in manufacturing.   But services would gain proportionately more; under the FTAAP, for example, services increase by 8.7% compared to 6.9% for manufacturing. Services grow more rapidly than manufacturing under the TPP track, but the Asian track produces the opposite result, reflecting differences in the templates of the two approaches. Food, Textiles, and Apparel are the most rapidly growing manufacturing exports; Construction and Trade and Transport are the fastest growing service exports. Primary products respond sluggishly in all scenarios; since the Asia-Pacific region generally imports these goods, most countries already impose low rates of protection (prominent exceptions include rice in Japan and Korea).

Adjustment effects

Politicians pay close attention to adjustment—an agreement that generates early dislocations may not be acceptable regardless of long-term benefits. We estimate adjustment effects by tracking annual output and employment changes at the sector level under each scenario. As we shall see, while these estimates provide an imperfect measure of adjustment, they suggest that the adjustment implications of both paths are manageable and substantially outweighed by benefits.

Table 8. Exports on alternative tracks

	Exports 2025	ΔExport in 2025 USD2007bill.				% Baseline exports			
		TPP	Asian track	Two tracks	FTAAP	TPP	Asian track	Two tracks	FTAAP
	Baseline								
TPP track economies	**4,612**	**105.4**	**1.9**	**107.3**	**425.4**	**2.3**	**0.0**	**2.3**	**9.2**
United States	2,845	55.7	2.8	58.6	291.7	2.0	0.1	2.1	10.3
Australia	328	9.1	-0.1	9.1	32.6	2.8	0.0	2.8	9.9
Canada	613	6.7	-0.7	6.0	17.0	1.1	-0.1	1.0	2.8
Chile	157	4.6	-0.5	4.2	8.4	3.0	-0.3	2.7	5.3
Mexico	519	15.9	0.6	16.1	57.8	3.1	0.1	3.1	11.1
New Zealand	57	3.2	-0.1	3.2	4.8	5.7	-0.1	5.7	8.5
Peru	92	10.2	-0.2	10.1	13.1	11.0	-0.2	10.9	14.2
Asian track economies	**6,060**	**-31.9**	**371.1**	**343.5**	**999.2**	**-0.5**	**6.1**	**5.7**	**16.5**
China	4,744	-23.7	288.1	267.5	840.0	-0.5	6.1	5.6	17.7
Hong Kong	235	-0.9	22.5	21.5	34.9	-0.4	9.5	9.1	14.8
Indonesia	488	-3.4	29.1	26.4	58.5	-0.7	6.0	5.4	12.0
Philippines	148	-0.9	7.4	6.5	17.7	-0.6	5.0	4.4	12.0
Thailand	445	-3.0	24.1	21.6	48.2	-0.7	5.4	4.8	10.8
Two-track economies	**2,698**	**195.3**	**253.0**	**384.9**	**436.4**	**7.2**	**9.4**	**14.3**	**16.2**
Brunei	9	0.2	0.4	0.4	0.4	1.8	4.2	4.8	4.7
Japan	1,239	61.2	116.1	159.9	180.5	4.9	9.4	12.9	14.6
Korea	627	48.1	91.9	116.8	123.1	7.7	14.6	18.6	19.6
Malaysia	328	16.4	13.2	27.1	28.8	5.0	4.0	8.3	8.8
Singapore	232	1.5	-3.0	-2.6	-9.8	0.6	-1.3	-1.1	-4.2
Vietnam	264	68.0	34.5	83.3	113.4	25.8	13.1	31.6	43.0
Others	**14,204**	**-46.2**	**-51.6**	**-93.7**	**-37.1**	**-0.3**	**-0.4**	**-0.7**	**-0.3**
Russia	1,163	-2.8	-4.5	-7.3	238.5	-0.2	-0.4	-0.6	20.5
Chinese Taipei	607	-4.6	-18.5	-20.8	107.5	-0.8	-3.0	-3.4	17.7
Europe	6,184	-14.9	-12.5	-27.5	-180.1	-0.2	-0.2	-0.4	-2.9
India	896	-3.0	-4.8	-7.5	-26.8	-0.3	-0.5	-0.8	-3.0
Other ASEAN	32	-0.8	1.7	1.0	5.7	-2.4	5.2	3.1	17.8
ROW	5,321	-20.2	-13.0	-31.6	-181.9	-0.4	-0.2	-0.6	-3.4
WORLD	**27,574**	**222.6**	**574.3**	**741.9**	**1,823.9**	**0.8**	**2.1**	**2.7**	**6.6**
Memorandum									
TPP9	4,312	169	47	193	484	3.9	1.1	4.5	11.2
ASEAN+3	8,790	163	626	729	1,441	1.9	7.1	8.3	16.4
APEC	15,140	261	603	808	2,207	1.7	4.0	5.3	14.6

Source: authors' estimates. GBL 17sep/tables

Table 9. Effects on the composition of world exports

| | Exports 2025 | ΔExports in 2025 (USD2007bill.) | | | | % Baseline exports | | | |
| | | TPP | Asian track | Two tracks | FTAAP | TPP | Asian track | Two tracks | FTAAP |
	Baseline								
Primary products	**2,550**	**0.0**	**9.2**	**8.4**	**23.7**	**0.0**	**0.4**	**0.3**	**0.9**
Rice	20	0.3	0.4	0.6	0.6	1.5	1.8	3.0	3.1
Wheat	51	-0.2	0.1	-0.1	-1.0	-0.4	0.1	-0.1	-2.0
Other agriculture	664	0.1	3.3	3.5	14.5	0.0	0.5	0.5	2.2
Mining	1,815	-0.2	5.4	4.4	9.7	0.0	0.3	0.2	0.5
Manufactures	**20,602**	**174.0**	**474.3**	**601.9**	**1,413.4**	**0.8**	**2.3**	**2.9**	**6.9**
Food, beverages	2,228	34.2	47.6	79.1	290.5	7.8	2.1	3.6	13.0
Textiles	781	22.4	42.9	56.3	99.9	4.4	5.5	7.2	12.8
Apparel, footwear	808	37.8	43.0	68.9	130.1	2.8	5.3	8.5	16.1
Chemicals	3,647	17.7	82.0	93.8	267.5	1.0	2.2	2.6	7.3
Metals	2,718	10.6	53.1	59.7	150.0	0.7	2.0	2.2	5.5
Electrical equipment	2,259	8.6	52.3	57.7	86.7	0.5	2.3	2.6	3.8
Machinery	3,906	14.9	91.7	101.5	175.4	0.2	2.3	2.6	4.5
Transport equipment	2,627	15.9	31.2	44.9	94.3	0.6	1.2	1.7	3.6
Other manufactures	1,629	11.8	30.5	40.1	119.2	0.9	1.9	2.5	7.3
Services	**4,421**	**48.6**	**90.8**	**131.6**	**386.8**	**1.1**	**2.1**	**3.0**	**8.7**
Utilities	77	0.0	0.2	0.1	0.0	20.6	0.2	0.2	0.0
Construction	140	1.2	2.4	3.6	18.0	8.4	1.7	2.6	12.8
Trade, transport, comm.	1,710	23.6	59.0	78.0	194.1	0.0	3.4	4.6	11.3
Private services	2,023	22.3	26.8	46.3	160.2	0.1	1.3	2.3	7.9
Public services	471	1.6	2.4	3.6	14.5	5.0	0.5	0.8	3.1
Total	**27,574**	**222.6**	**574.3**	**741.9**	**1,823.9**	**0.8**	**2.1**	**2.7**	**6.6**

Source: authors' estimates. GBL 17sep/tables

We measure adjustment as the sum of *reductions* in employment across all sectors of the economy in a given year. For example, adjustment on the baseline path is estimated as:

(1) $A^b_{jt} = -\sum_i max(0, L^b_{ij,t} - L^b_{ij,t-1})$

where A^b_{jt} = adjustment at time t in country j on the baseline
        L^b_{jt} = employment at time t in sector i in country j on the baseline

The model constrains total employment to be the same across scenarios—if a scenario indicates employment losses compared to the baseline, it will also indicate corresponding employment gains in other sectors. In other words, adjustment means job *shifts*, not job losses.

Job shifts are of interest because they generate private and social costs. A job shift may require workers to learn new skills or to move to new locations. Workers may become unemployed while searching for a new job, and older workers may even drop out of the labor force. These are real costs that must be compared to the benefits generated by trade policies. The benefits of associated with trade liberalization typically outweigh these losses, but those who gain and those who bear

the costs are typically different people—in terms of age, geography and educational background. Ideally government adjustment policies will need to transfer some of the benefits from winners to losers to ensure that everyone gains—that is, to achieve what economics calls "Pareto optimal" gains.

It is important to recognize that in some countries significant job shifts are projected even on the baseline. Employment will shrink in every sector where labor productivity growth is projected to outpace the demand for output. (In most mature economies, the evidence suggests that the majority of job shifts is due to technological change rather than trade.) In countries with high labor force growth rates, few sectors, even those with declining demand and high productivity change, experience employment declines. At the other extreme of slow or negative labor force growth, even small sectoral departures from average demand and productivity growth can yield contracting employment. Figure 6 shows a scatter of annual baseline adjustments in 2025 (as a percent of the total labor force) against labor force growth rates. The left-most points show annual adjustment burdens in the 2% range and labor force growth rates in the -1% range, describing aging economies such as Korea, Chinese Taipei and Russia.

Figure 6. Adjustment and employment growth
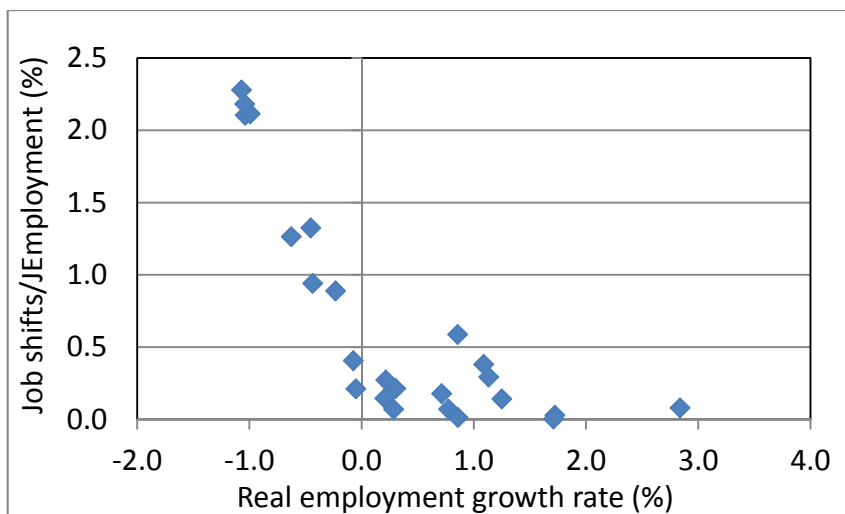
Source: authors' estimates. GBL 17sep/adjust25

The incremental adjustment burden of each scenario can be estimated by calculating adjustments as above, and subtracting adjustments on the baseline:[18]

(2) $\quad \Delta A^s_{jt} = - \sum_i max(0, L^s_{ij,t} - L^s_{ij,t-1}) - A^b_{jt}$

where ΔA^s_{jt} = adjustment effect of scenario s in country j at time t

An important caveat must be added. Our measure of job shifts accounts for inter-sectoral job shifts, but not those within each model sector. It is therefore sensitive to sector detail; a model

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[18] The baseline adjustment estimate subtracted in this equation may involve different jobs from the scenario adjustment estimate.

with 200 sectors would show more adjustment than one with 20. Yet job shifts between large sectors—such as those in our study—are the most costly and disruptive, because skill and location differences are smaller between subsectors than across industries. Indeed, if sectors were defined finely enough, transitions would occur within firms without any significant dislocations. But given the aggregation of our model, the adjustment estimates may understate the extent of costly job shifts.

This caveat notwithstanding, the model provides information for comparing adjustment to the benefits of integration. Consider, for example, the results for the FTAAP, the most disruptive of all of the scenarios modeled, in the year when the maximum disruptions occur (2025). For that year, Figure 7 plots job shifts (on the vertical axis as a percent of employment) against benefits (on the horizontal axis as equivalent variations relative to GDP) for the 24 regions. The figure shows correlation between job shifts and welfare benefits; it suggests that 5% of GDP in welfare benefits are associated with around 2% of the labor force shifting jobs. (The implications for the United States will be discussed in more detail below.) In later years, adjustments diminish and benefits rise. Thus, even when dislocations are at their maximum, the annual benefits generated by trade agreements could provide very generous adjustment assistance to affected workers.

Figure 7. Adjustment and welfare: FTAAP scenario in 2025
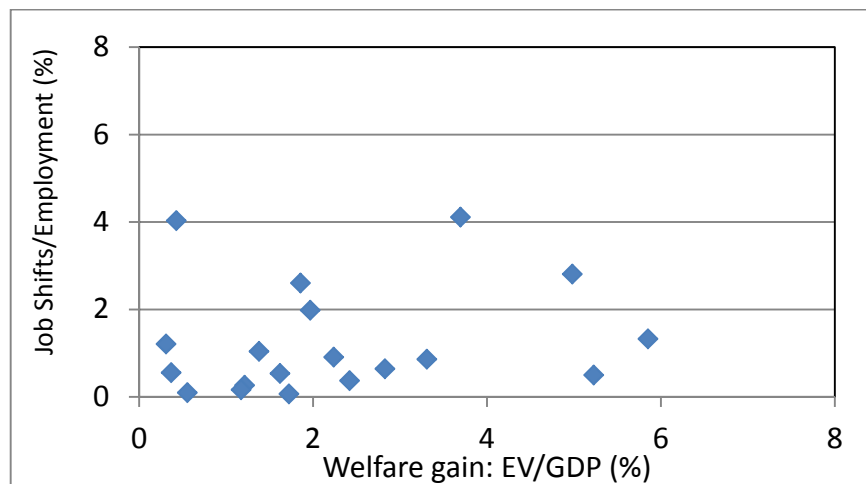
Source: authors' estimates. GBL 17sep/adjust25

The sectoral implications of each agreement depend on its structure. Broadly, agreements that link emerging and advanced economies and help to liberalize service sectors, such as the TPP and a TPP-based FTAAP, will tend to shift jobs from manufacturing to services in advanced economies, and from services to manufacturing in emerging economies. These patterns are illustrated in Figure 8 for the United States, China and Japan. Agreements among mainly emerging economy members (such as the EAFTA) generate more idiosyncratic results, with changes depending on each country's endowments and technological advantages.

Figure 8. Changes in value added in 2025: U.S., China and Japan ($bill.)

a. United States	b. China	c. Japan
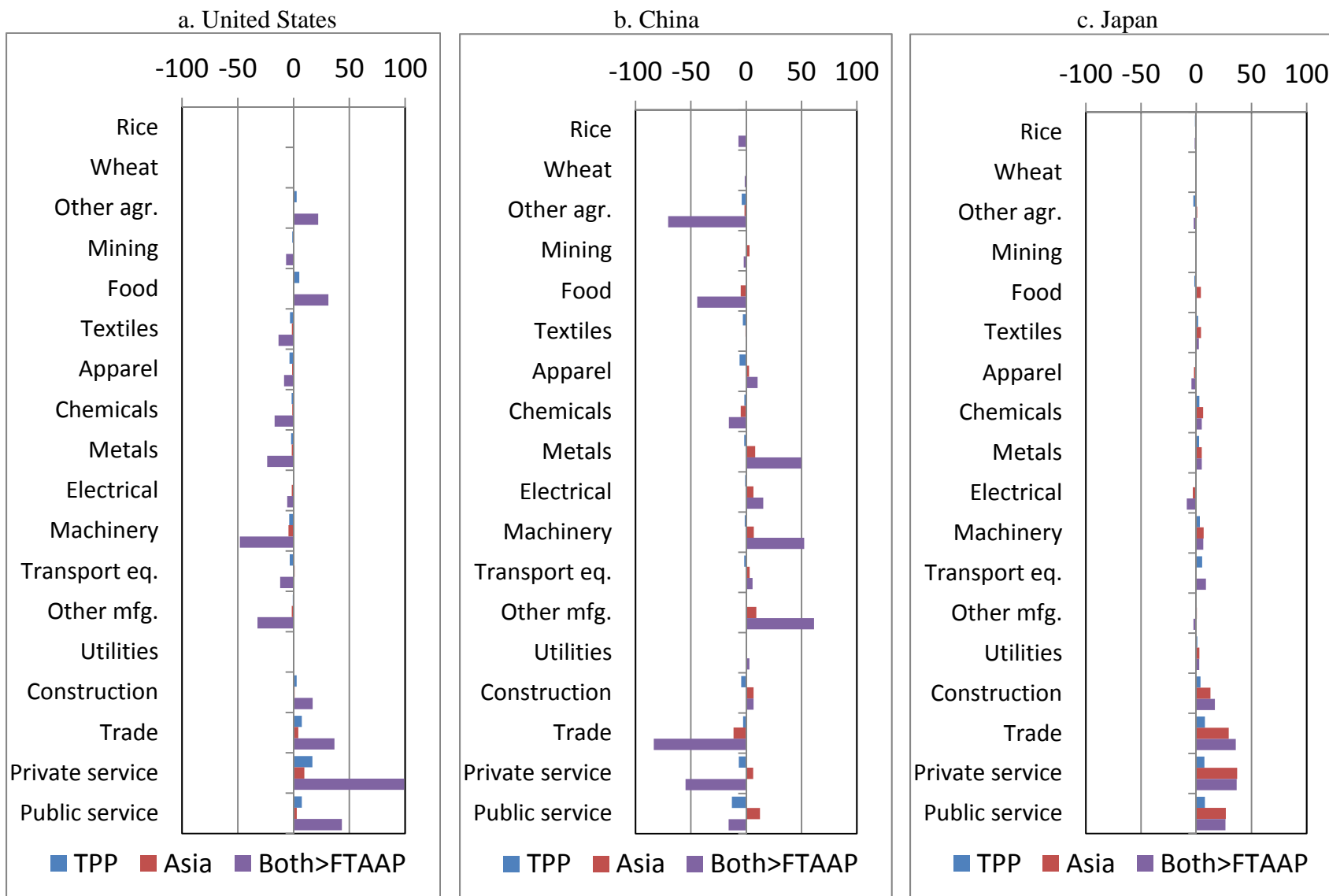
Source: authors' estimates. GBL 17sep/va

Figure 9. Japanese output changes in 2025: percentage and value added

a. Percentage measure

b. Value added measure ($bill).

Legend: TPP, Asia, Both>FTAAP

Categories (top to bottom): Rice, Wheat, Other agr., Mining, Food, Textiles, Apparel, Chemicals, Metals, Electrical, Machinery, Transport eq., Other mfg., Utilities, Construction, Trade, Private service, Public service

Axis scale: -75 -50 -25 0 25 50 75

Source: authors' estimates. GBL 17sep/va

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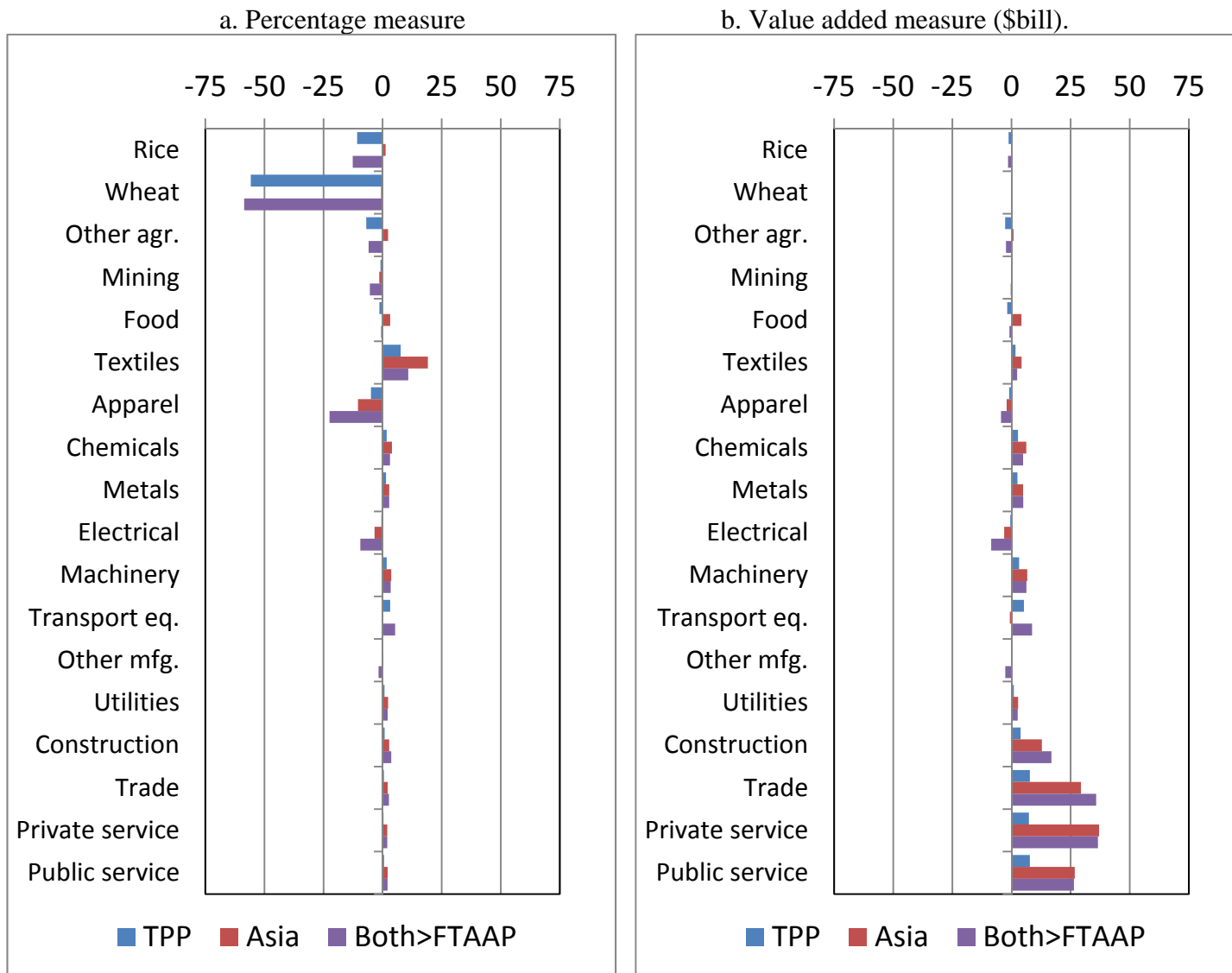
In reviewing such sectoral effects, it is important to note that impressions of the size and pattern of adjustment effects depend on how the results are presented. Figure 9 contrasts results for Japanese production changes measured in percentage terms and in value added terms. The percentage measure on the left draws attention to large declines in small agricultural sectors, while the value-added measure on the right draws attention to gains in services.

Impacts on non-members

The global effects of all scenarios are overwhelmingly positive, but Table 8 projects that that export changes will be negative for some countries in some scenarios. This mostly reflects trade diversion under preferential trade agreements: a shift from an efficient, non-participating exporter to participating countries that receive preferences. Trade diversion harms the importer, which now buys costlier regional products, and the exporter, which suffers deterioration in terms of trade (Lloyd and Maclaren 2004). These effects explain welfare losses in Table 7 in "Asian track" countries under the TPP scenario, and in "other" countries under most scenarios.

The trade diversion effects of the TPP fall mainly on China, although they are small (0.09%) compared to the Chinese economy. The effect mirrors the benefits of TPP members such as Vietnam, which compete with China for U.S. markets. Although the results show trade diversion also for several "TPP-track" economies under Asian initiatives, the welfare spillovers are slightly positive. The productivity gains associated with economic integration in Asia appear to be so vigorous that they improve the terms of trade even for non-participating countries such as the United States. These small effects allow outsiders to capture a little of the benefits of Asian integration.

Both tracks, as well as a consolidated region-wide agreement, would divert trade and welfare from countries not participating in them. For example, Russia would experience slight losses under both tracks until the FTAAP (in which it is assumed to participate). Then it would enjoy the second- largest gains behind China. The losses of India and the rest-of-the-world are more consistent; they compete with economies on both tracks and sustain losses around ¼ percent of GDP.

The striking, dominant result is that trade-creation benefits vastly exceed trade-diversion losses. Under the FTAAP (approached from both tracks), for example, member regions would gain $914 billion, while excluded regions would lose $51 billion; trade diversion losses account for only 6% of the benefits. Comparable ratios for the TPP and Asian tracks are 21% and 4%, respectively. The reason for these results is that both tracks are "natural blocs," in the sense that member economies already trade intensively with each other and include globally efficient producers for many traded products (Frankel et al. 1995). Thus, liberalization mainly encourages exchange among already efficient producers and results in trade creation. The large ratio of gains to losses also implies that the participants that benefit from these agreements will have ample resources to blunt their negative impact on excluded partners such as India.

6. Strategic implications of alternative tracks

The rules of the Asia-Pacific economic system are the results of a "game"—that is, interdependent decisions by several countries. This section examines how the implications of the agreements would affect decisions on each track, and how these decisions in turn would affect progress along the tracks and interactions between them.

The prize of Asia-Pacific integration is the estimated $862 billion gain generated by the FTAAP in 2025 (see Table 7). The large a surplus invites competition for shares. To maximize their shares, countries will try to control the pattern of regional integration. Indeed, if competing interests—among and within countries—are intense enough, it is difficult to reach an agreement at all. This is why region-wide integration is likely to proceed initially with agreements among countries with compatible interests. Baldwin (1995, 2006) and McCulloch and Petri (1997) provide formal models to explain this process. The TPP and Asian tracks represent such relatively compatible interests. Our results suggest that both processes are also dynamically viable, in the sense that they encourage enlargement and eventually even consolidation.

At the same time, strategic interactions among different countries appear to be milder than is often presumed in policy discussions. Policies by one country affect others, but the spillovers are smaller than effects at home.[19] This is consistent with the theoretical prediction of many models that the benefits of liberalization accrue mainly to the liberalizing (home) economy by enabling it to use its resources more efficiently. These benefits appear to be even more important in modern models of trade, which recognize productivity benefits from economies of scale and resource shifts from less- to more-efficient firms. In turn, spillovers to foreign producers are limited because firms abroad have multiple options for adjusting to policy changes. These adjustments could include changes in input requirements and sources, and in output mix and markets. Such changes may take time, but gradual policy transitions make them even more manageable. (Section 7 will report empirical results on the adjustment process.)

The economics notwithstanding, international spillovers appear to matter for trade politics. The political magnification of small economic effects may be due to the structure of the adjustments induced by trade policy. For example, international spillovers, even if small, may systematically impact small groups of economic agents—those exposed to a particular set of international transactions—whose welfare is then disproportionately affected. Various theories help to explain why such groups will be effective in projecting their interests into national decision making. Thus, it is useful to analyze even modest strategic interactions for clues on the politics of alternative policy choices.

Trans-Pacific track

On the TPP track, global benefits grow from $16 billion in 2015 to $84 billion in 2020 and $104 billion in 2025 (Table 10). In the early stages (which involve the implementation of the TPP9 by 2015), the main attraction is preferential access to large U.S. markets. U.S. MFN barriers are

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[19] This conclusion depends on the model used to represent the economy. CGE models assume adjustments in markets and price signals. The effects of changes in the coefficients that govern the flexibility of these adjustments are explored in sensitivity analyses.

low, but special pockets of protection, for example in Apparel, make concessions attractive to producers with comparative advantage in those areas. Those producers, in turn, undertake

Table 10. Welfare on the TPP track

	Welfare gains (EV USD2007bill.)			% Baseline GDP		
	2015	2020	2025	2015	2020	2025
TPP track economies	**8.6**	**30.4**	**40.8**	**0.04**	**0.13**	**0.15**
United States	4.9	10.4	13.9	0.03	0.06	0.07
Australia	0.4	1.8	2.4	0.03	0.15	0.17
Canada	-0.1	2.0	2.3	0.00	0.11	0.12
Chile	0.6	1.6	2.3	0.28	0.68	0.78
Mexico	0.2	8.1	11.7	0.01	0.50	0.58
New Zealand	0.3	1.2	1.7	0.21	0.67	0.83
Peru	2.4	5.2	6.6	1.36	2.19	2.12
Asian track economies	**-2.8**	**-11.9**	**-19.2**	**-0.03**	**-0.08**	**-0.10**
China	-2.2	-9.6	-15.7	-0.03	-0.08	-0.09
Hong Kong	0.0	-0.1	-0.1	-0.01	-0.02	-0.02
Indonesia	-0.2	-1.0	-1.5	-0.03	-0.09	-0.10
Philippines	-0.1	-0.3	-0.4	-0.06	-0.13	-0.12
Thailand	-0.2	-1.0	-1.4	-0.06	-0.24	-0.28
Two-track economies	**10.9**	**70.5**	**90.3**	**0.16**	**0.94**	**1.07**
Brunei	0.0	0.1	0.1	0.14	0.48	0.48
Japan	-0.3	26.8	30.7	-0.01	0.54	0.58
Korea	-0.2	12.0	15.1	-0.02	0.71	0.73
Malaysia	3.7	7.3	9.4	1.43	2.21	2.24
Singapore	0.2	0.9	1.4	0.07	0.28	0.35
Vietnam	7.5	23.5	33.5	6.37	13.89	14.27
Others	**-0.9**	**-4.9**	**-7.7**	**0.00**	**-0.01**	**-0.02**
Russia	0.0	-0.5	-1.0	0.00	-0.02	-0.03
Chinese Taipei	-0.1	-1.0	-1.6	-0.02	-0.15	-0.20
Europe	0.1	0.9	1.6	0.00	0.00	0.01
India	0.0	-0.4	-0.6	0.00	-0.01	-0.01
Other ASEAN	0.0	-0.2	-0.2	-0.11	-0.28	-0.30
ROW	-0.9	-3.8	-5.9	-0.01	-0.03	-0.04
WORLD	**15.9**	**84.1**	**104.3**	**0.02**	**0.10**	**0.10**
Memorandum						
TPP9	20.0	52.1	71.3	0.11	0.25	0.30
ASEAN+3	8.1	58.5	70.9	0.05	0.27	0.25
APEC	16.7	87.6	109.4	0.04	0.18	0.19

Source: authors' estimates. GBL 17sep/tables

liberalization measures that also improve the productivity of their own resources. Thus, the first stage of the TPP generates large proportional gains for small economies that compete with China and other major suppliers of the U.S. market—Vietnam, Malaysia and Peru, and to a lesser extent New Zealand and Chile. These countries have strong incentives to make sure that the TPP gets off the ground.

In the second stage, the TPP is assumed to absorb Canada, Japan, Korea and Mexico. Since several of these economies do not have free trade agreements with each other, an important attraction of TPP13 is expanded access beyond the U.S. market, to the markets of newcomers. For example, Australia's welfare gains as a percentage of its GDP would nearly quadruple from the TPP9 to TPP13 since the latter agreement would provide access to the Japanese and Korean markets. (Preferential access to the U.S. market does not count as a TPP benefit to Australia, since it already had a bilateral FTA with the United States before the TPP.) Overall, the second stage adds important new "cylinders" to drive TPP benefits and provides greater incentives for members to support enlargement.

After the second stage, the gains taper off rapidly—from a five-fold increase in 2015-2020 to a 24% increase in 2020-2025.   Assuming similar patterns on the Asian track (discussed below), the next opportunity will require merging the tracks into the FTAAP, as discussed below.

Asian track

On the Asian track, world benefits rise to $44 billion in 2015, $138 billion in 2020 and $215 billion in 2025 (Table 11). This path is also usefully decomposed into three stages.   In the first stage, the CJK agreement is implemented by 2015. This would mainly affects Japan, Korea and China, with benefits relatively equally shared among them. Since these benefits are significant, they provide incentives for the CJK stage, politics willing. Other countries would experience small, mostly negative spillovers. For example, in 2015 several ASEAN economies would suffer welfare losses in the range of 0.1 to 0.4 percent of GDP, although these losses are smaller than the welfare gains derived from implementing ASEAN+1 agreements that are already incorporated in the baseline scenario. In effect, the CJK would erode part of the preferential gains from ASEAN's earlier FTAs with China.

The second stage would involve the consolidation of the CJK and ASEAN+1 agreements into a comprehensive EAFTA by 2020. All Asian economies would gain substantially with the exception of Singapore. (The reason is that Singapore's baseline gains from a large initial portfolio of FTAs would be now neutralized by preferences that become available to all Asian economies.) Although the EAFTA does not result in any new reductions in barriers, the cumulation of rules of origin across a larger economic zone should generate much higher rates of utilization of preferences. This reduces the effective protection of regional trade and hence leads to the deeper integration of Asian economies. ASEAN economies would experience gains of around one percent of GDP. If the first step of the Asian track is driven by large economies, the second stage generates region-wide benefits and hence incentives for many countries to promote the agreement.

Given rapid Asian growth, benefits would continue to expand after the second stage, adding $215 to world GDP in 2025 ($77 billion more than 2020). But as on the TPP track, the growth of benefits would slow, and making the consolidation of the TPP and Asian tracks the next logical step. We turn to options for achieving that goal.

Table 11. Welfare on the Asian track

	Welfare gains (EV USD2007bill.)			% Baseline GDP		
	2015	2020	2025	2015	2020	2025
TPP track economies	**2.4**	**4.5**	**6.7**	**0.01**	**0.02**	**0.03**
United States	0.9	1.9	3.2	0.01	0.01	0.02
Australia	0.1	0.0	0.1	0.01	0.00	0.01
Canada	0.2	0.3	0.4	0.01	0.01	0.02
Chile	0.0	0.1	0.1	0.02	0.03	0.04
Mexico	1.2	2.2	2.8	0.09	0.13	0.14
New Zealand	0.0	0.0	0.0	0.01	0.00	0.02
Peru	0.0	0.0	0.1	0.01	0.01	0.02
Asian track economies	**6.9**	**69.7**	**120.1**	**0.07**	**0.50**	**0.61**
China	8.5	50.7	84.8	0.11	0.42	0.50
Hong Kong	-0.2	9.8	15.1	-0.06	2.94	3.72
Indonesia	-0.4	3.3	8.1	-0.05	0.31	0.55
Philippines	-0.3	2.0	3.8	-0.15	0.81	1.25
Thailand	-0.8	4.0	8.3	-0.24	0.97	1.60
Two-track economies	**35.0**	**69.8**	**98.3**	**0.53**	**0.93**	**1.16**
Brunei	0.0	0.1	0.3	0.04	0.76	1.31
Japan	20.2	31.9	42.8	0.44	0.64	0.80
Korea	16.1	25.7	33.5	1.16	1.52	1.63
Malaysia	-0.5	3.6	6.5	-0.19	1.10	1.53
Singapore	-0.3	-0.3	0.0	-0.12	-0.08	-0.01
Vietnam	-0.5	8.8	15.2	-0.42	5.20	6.49
Others	**-0.8**	**-6.3**	**-9.9**	**0.00**	**-0.02**	**-0.02**
Russia	-0.3	-0.7	-1.3	-0.02	-0.03	-0.05
Chinese Taipei	-2.2	-5.1	-7.6	-0.42	-0.79	-0.95
Europe	1.9	3.7	6.2	0.01	0.02	0.03
India	-0.2	-3.1	-6.3	-0.01	-0.09	-0.12
Other ASEAN	0.0	0.3	0.5	-0.01	0.45	0.64
ROW	0.0	-1.4	-1.4	0.00	-0.01	-0.01
WORLD	**43.5**	**137.6**	**215.3**	**0.06**	**0.16**	**0.21**
Memorandum						
TPP9	-0.2	14.3	25.5	0.00	0.07	0.11
ASEAN+3	41.9	139.8	219.0	0.26	0.65	0.78
APEC	41.9	138.1	216.2	0.11	0.29	0.37

Source: authors' estimates. GBL 17sep/tables

Pathways to the FTAAP

A consistent theme of the simulations is that future Asia-Pacific integration—as represented by the FTAAP—could generate very large benefits. We estimate a range of $681-$969 billion, nearly one percent of world GDP (Table 12). These alternative values represent the results of reaching the FTAAP on different pathways, including the TPP and the Asian tracks.

The pathways could affect the benefits of the FTAAP in three ways. First, the agreements that precede the FTAAP may change the probability of moving to the FTAAP. Second, prior

agreements may affect the structure of each economy on the eve of the FTAAP, and hence the further adjustments required. Third, they may influence the liberalization effects of the FTAAP itself by shaping the template used to set it up.

Our model has relatively little to say about the probability of moving to the FTAAP. One difference between the tracks is that the TPP and APEC explicitly recognize the FTAAP as an ultimate goal, while Asian integration efforts have so far focused on Asian economies. In the end, much will depend on political interest in Trans-Pacific integration. Economic issues could work in either direction. The net gains from the FTAAP would be greatest if no prior agreements were in place, and smallest if both tracks were implemented. But the latter configuration would also make it easiest to move to the FTAAP, because it reduces adjustment costs and gives countries greater confidence in liberalization.

A more important and predictable effect involves the template used to reach the FTAAP—as we already noted, the TPP and Asian tracks could be seen as efforts by the United States and China to influence that template. Templates developed on each track presumably favor the countries that draft them; when a template is carried into a wider integration project, it can be expected to benefit its "authors."

We examine four ways of getting to the FTAAP, based on templates similar to those assumed for the TPP and Asian tracks. The details differ in several dimensions, but generally the TPP template assumes larger reductions in behind-the-border barriers and greater improvements in market access for services and IPR-intensive goods. These provisions, in turn, would stimulate exports by advanced countries, although they would also yield productivity gains in all countries. Such assumptions about distant future agreements are inherently speculative, but they permit more nuanced analysis of the pathways to the FTAAP than simply assuming general, complete liberalization.

Results are summarized in Table 12. Given its deeper liberalization measures, the TPP pathway shows the largest benefits, $969 billion. The Asian pathway would yield gains of $681 billion; the two-track approach is assumed to fall in between. As expected, the United States would get a slightly larger share of total benefits on the TPP track than on the Asian track, and the reverse would be true for China. But these differences are small—the depth of liberalization, more than its structure, dominates the gains of the United States, China and other participants. Thus, China too would gain more on the TPP track than the Asian track, even with slightly smaller shares.

Indeed, the most important contribution of the TPP to Asia-Pacific integration is likely to be a rigorous template for future liberalization efforts. If that template is adopted in an Asia-Pacific agreement, it would generate $288 billion (42%) more in world welfare gains than the template from the Asian track. Moreover, these benefits would be widely shared. Much of the global increment ($176 billion, or 61%) would accrue to Asian-track economies. In fact, the indirect impact of the TPP—in raising the value of the FTAAP—would be greater than its direct impact ($104 billion). The same comparison is true for individual countries; the United States, for example, would gain $22 billion more from an FTAAP based on the TPP rather than the Asian template, compared to $14 billion in direct gains from the TPP itself.

Table 12. Pathways to the FTAAP

	GDP 2025	Welfare gains in 2025 (EV USD2007bill.)				% Baseline GDP			
	Baseline	Via baseline	Via TPP	Via Asia	Via both	Via baseline	Via TPP	Via Asia	Via both
TPP track economies	**26,550**	**123.6**	**150.1**	**101.7**	**134.8**	**0.47**	**0.57**	**0.38**	**0.51**
United States	20,337	58.7	70.8	49.0	62.9	0.29	0.35	0.24	0.31
Australia	1,426	6.9	9.0	5.6	7.9	0.48	0.63	0.39	0.55
Canada	1,982	8.8	8.0	6.5	7.3	0.44	0.40	0.33	0.37
Chile	289	4.2	5.6	3.2	5.0	1.47	1.94	1.09	1.72
Mexico	1,999	36.3	45.6	30.9	41.3	1.82	2.28	1.55	2.07
New Zealand	206	2.2	2.8	1.6	2.5	1.05	1.35	0.77	1.22
Peru	311	6.6	8.2	5.0	7.9	2.11	2.65	1.60	2.53
Asian track economies	**19,540**	**373.8**	**443.4**	**311.4**	**387.3**	**1.91**	**2.27**	**1.59**	**1.98**
China	16,834	300.1	360.0	259.0	318.7	1.78	2.14	1.54	1.89
Hong Kong	405	21.9	30.5	17.1	24.7	5.40	7.53	4.23	6.10
Indonesia	1,473	19.3	21.2	13.6	17.3	1.31	1.44	0.93	1.18
Philippines	308	9.4	10.8	7.0	8.9	3.07	3.51	2.28	2.90
Thailand	520	23.1	20.9	14.6	17.6	4.44	4.02	2.80	3.38
Two-track economies	**8,460**	**178.3**	**207.4**	**162.9**	**207.5**	**2.11**	**2.45**	**1.93**	**2.45**
Brunei	22	0.5	0.4	0.3	0.4	2.10	1.79	1.29	1.64
Japan	5,332	61.2	68.2	63.7	73.6	1.15	1.28	1.19	1.38
Korea	2,063	41.7	45.3	41.4	48.2	2.02	2.20	2.01	2.34
Malaysia	422	18.5	24.1	14.4	22.2	4.39	5.70	3.41	5.25
Singapore	386	2.1	3.0	1.0	1.6	0.56	0.77	0.26	0.42
Vietnam	235	54.2	66.5	42.1	61.4	23.04	28.29	17.93	26.14
Others	**47,418**	**137.2**	**167.5**	**104.9**	**132.6**	**0.29**	**0.35**	**0.22**	**0.28**
Russia	2,790	152.5	185.6	122.8	152.3	5.47	6.65	4.40	5.46
Chinese Taipei	800	34.4	37.8	25.4	30.2	4.30	4.73	3.18	3.77
Europe	22,237	-3.4	-3.1	-2.8	-2.3	-0.02	-0.01	-0.01	-0.01
India	5,229	-10.2	-11.8	-9.1	-10.9	-0.19	-0.23	-0.17	-0.21
Other ASEAN	82	2.3	2.0	1.4	1.7	2.86	2.45	1.76	2.04
ROW	16,280	-38.4	-43.0	-32.8	-38.3	-0.24	-0.26	-0.20	-0.24
WORLD	**101,967**	**812.9**	**968.5**	**680.9**	**862.2**	**0.80**	**0.95**	**0.67**	**0.85**
Memorandum									
TPP9	23,634	153.8	190.3	122.1	171.7	0.65	0.81	0.52	0.73
ASEAN+3	28,081	554.4	652.8	475.7	596.4	1.97	2.32	1.69	2.12
APEC	58,140	862.6	1,024.4	724.2	912.0	1.48	1.76	1.25	1.57

Source: authors' estimates. GBL 17sep/tables

Shifting leadership

The analysis of the tracks suggests shifting national interests and probable leadership over time. In line with our earlier discussion of progress along each track, these shifts are likely to occur in three stages.

In the first stage, the markets of the United States, China and Japan would drive integration, attracting smaller economies to each track. These large countries will need to open their markets in order to lead the tracks, despite small direct benefits. They are likely to do so for long-term reasons: progress toward region-wide integration, a framework that benefits their economies, and regional political influence. Early TPP and Asian agreements would have important implications for subsequent integration.

In the second stage the tracks are likely to expand by adding large economies such as Japan and Korea; benefits will grow. The Chinese and Japanese hubs, for example, may be connected. This would make the gains attractive to many countries. Those involved in both tracks would have gained preferential access to Chinese and U.S. markets, and also to each other's. In particular, ASEAN, Japan, Korea and Mexico would enjoy large benefits as the tracks expand and could drive the second phase of Asia-Pacific integration—much as ASEAN appears to be doing already. Smaller economies that participate in both tracks—such as Malaysia and Vietnam—would do even better in percentage terms. Other emerging economies, such as the Philippines and Thailand, may emulate them and request accession to the TPP.

In the third stage, it would be up to China and the United States to complete the Trans-Pacific integration process. Economies that had earlier joined both tracks will have little to gain from further integration. Japan and Korea, for example, would have achieved 91% and 90%, respectively, of the total possible gains from a region-wide FTAAP by joining both the TPP and Asian tracks (see Table 7). However, the environment for Chinese and U.S. decisions will have dramatically changed. The United States and China will have opened their markets to most Asia-Pacific countries—but not to each other. Moving to an FTAAP would dramatically increase their gains, multiplying U.S. benefits four-fold and Chinese benefits six-fold. China and the United States will have strong incentives to consolidate the tracks.

That China and United States must ultimately lead Trans-Pacific integration is hardly surprising. Indeed, that eventual negotiation may explain their current interest in the TPP and Asian tracks. From an analytical viewpoint, the tracks define what bargaining theory calls the "disagreement point" of a region-wide negotiation. This point represents payoffs in the absence of an agreement and shapes the bargaining outcome. In this case, the TPP and Asian agreements establish fallback positions if the FTAAP fails. Theory suggests that the stronger a country's disagreement point, the larger will be its share of the surplus from a successful deal. Thus, China and the United States can be expected to make substantial investments in their respective tracks, while also signaling commitment to a Pacific-wide framework.

In sum, both tracks create incentives for their parallel progress and eventual consolidation. Leadership in the early stages has to come from the largest economies, the United States and China, since their markets act as magnets. In intermediate stages, energetic support should come from middle powers, including ASEAN, Japan, Korea and Mexico. Once the tracks reach an advanced stage, China and the United States will again have to lead. But by then the two tracks will have resulted in large benefits for most Asia-Pacific producers, except for China and the United States. They will have amplified incentives to cooperate.

7. National economic interests

To explore policy choices in key countries, we now view the results through national lenses. We focus on the three largest economies (the United States, China and Japan) and on selected other countries that represent interesting effects of the tracks. We continue to conduct the analysis primarily from the viewpoint of economics, recognizing that policy will be influenced—and perhaps even dominated—by geopolitical considerations.

United States

After a half century of stewardship for global trade policy, the United States is stepping back from leadership in the world trading system. In the two decades since NAFTA and Uruguay Round negotiations, the United States has signed few new trade agreements and provided only limited support to the Doha Round. Trade policy has become controversial in its domestic politics, as demonstrated by the torturous approval of the Colombia, Korea and Panama FTAs. The United States appears to be falling behind other countries in pursuing integration, including notably East Asia and Europe (Bergsten and Schott 2010). In the TPP scenario we assumed a far more active U.S. policy, leading to the TTP9 and its rapid enlargement leading to the FTAAP.

This strategy will have to be crafted in the midst of an historic geopolitical transition, the revival of China as a major Pacific and global power. There are two extreme views of how the United States will deal with this transition: one envisions collaboration with a dynamic Asia; another anticipates a tense contest for dominance. Interestingly, both views are consistent with active U.S. trade policy. Those who hope for a cooperative future argue that the TPP could prevent a "line drawn down the middle of the Pacific" (Bergsten and Schott 2010). Those who perceive the politics as less benign see the TPP as an effort to draw that line (Drysdale 2011).

Although these views are shaped in part by non-economic considerations, they recall an interesting puzzle in the analysis of free trade areas—the so-called "Krugman vs. Krugman debate." In one theoretical article, Paul Krugman (1991a) argued that proliferating FTAs would lead to three protectionist blocs, but in another he "proved" that they would coalesce into a global agreement (Krugman 1991b). Of course, this is not an issue that can be settled by theory; much depends on the characteristics of FTAs and the political setting. The TPP too might promote or inhibit Asia-Pacific integration depending on whether it allows enlargement over time, and on the political context of future U.S.-China relations.

With the negotiations far from complete, it is too early to judge whether or not the TPP will be enlargement-friendly. Its wide coverage of issues, selective membership, and commitment to standards exceeding those of previous FTAs suggest that the TPP will be a difficult agreement to join. But the terms may become softer by the time an agreement is reached. More importantly, they can be modified in future enlargements, much as the P4 is transitioning into the TPP. Thus, strict disciplines need not be interpreted as efforts to impede enlargement; they may simply set a high "disagreement point" that allows members to achieve better terms under enlargement. Since benefits increase with the size of an agreement, economics argues for provisions that facilitate enlargement. Ideally, provisions will be negotiated with this long-term perspective.

What is clear is that U.S. gains from the TPP depend on progress beyond the early stages of the agreement, and specifically on the establishment of the eventual FTAAP. By following the TPP path, the United States can help draft a template that supports broad liberalization and serves its interests in larger future agreements. As Figure 10 shows, if a TPP-based FTAAP is adopted in 2025, it would increase U.S. benefits seven-fold from 2020 to $71 billion. It would also expand U.S. exports by $327 billion (12%) above the baseline.[20] Of this increase, agriculture and mining would account for $15 billion, manufacturing for $118 billion, and services for $194 billion, the last increasing by 23% relative to the baseline. The FTAAP would reinforce all U.S. exports, but especially those associated with sophisticated goods and services.

Figure 10. U.S. welfare gains on alternative tracks ($bill.)
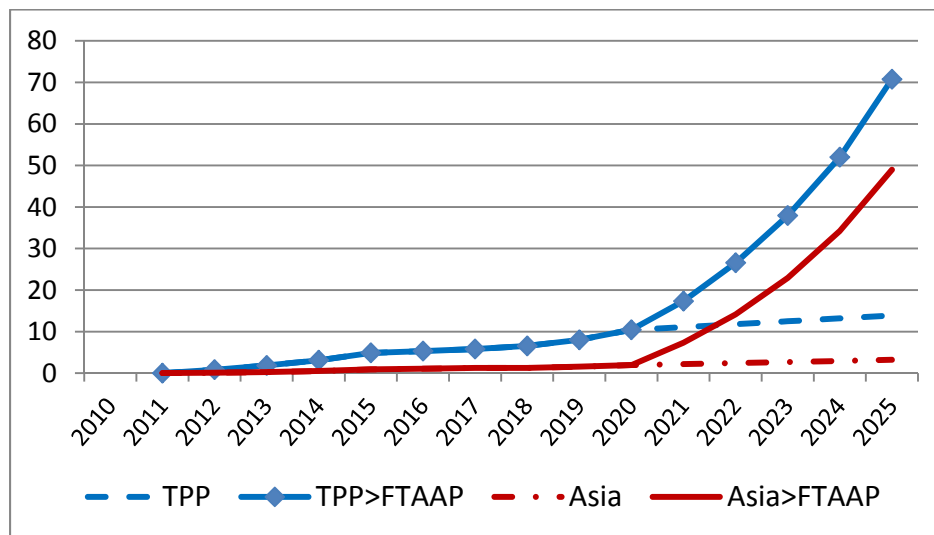
Source: authors' estimates. GBL 17sep/Lusa

From the viewpoint of politics, adjustment implications are of particular interest. Adjustments would be modest on the TPP track, at least until the FTAAP kicks in.   The simulations suggest annual job shifts—in the limited sense defined in Section 5—rising barely above normal background levels in the first stage of implementation to 2015 (Figure 11). Benefits in this period would be in the range of $500,000-$1,000,000 per job shift—many times the approximate annual compensation of $50,000 per worker. Adjustments would rise to 15,000-30,000 jobs in the 2015-2020 time frame, compared to a U.S. labor force of 161-164 million workers.

The job shifts induced by the TPP would affect roughly 1-2 workers in every 10,000. In this period of transition the economy would benefit by about $300,000 for each job shift, or about six years of compensation per affected worker. Interestingly, jobs shifts would be almost as large even if the TPP is not realized but the Asian track moves forward (see Figure 11). Those shifts would result from the increased productivity and competitiveness of Asian products, but would not generate much smaller benefits to the U.S. economy than the TPP. Adjustments will be

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[20] Both exports and imports would grow since the trade balance is assumed to be constant across trade initiatives. This follows standard theory in linking the current account balance to macroeconomic rather than trade determinants.

inevitable in a changing global economy, whether or not the United States participates in new trade agreements.

Adjustment requirements would grow with the implementation of the FTAAP in the 2020-2025 period with inter-sectoral job shifts rising to around 300,000 annually, affecting about 2 workers in every 1,000 (Figure 11). The ratio of benefits to shifts would remain high—around $200,000 per job shift, covering annual compensation four-fold (Figure 12). After 2025, when implementation is complete, adjustments would fall sharply, but benefits would continue to increase (with the ratio of benefits to adjustment costs approaching infinity). Figure 12 also shows that benefits per job shift would be higher if the FTAAP is approached from the TPP pathway (dashed line) than if it were adopted from scratch (solid line). Gradual implementation reduces the required job changes; a longer adjustment period allows firms to anticipate and minimize cutbacks, if required, by slowing earlier employment growth. The TPP would spread out and partly eliminate job shifts associated with trade adjustments in the future.
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Figure 11. U.S. adjustment on alternative tracks (000 job shifts)
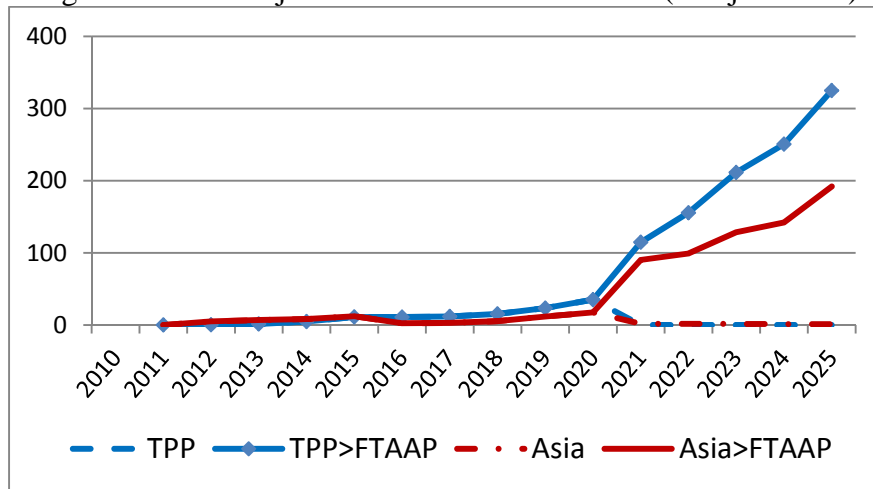
Source: authors' estimates. GBL 17sep/Lusa

Figure 12. U.S. welfare gains per job shift ($000)
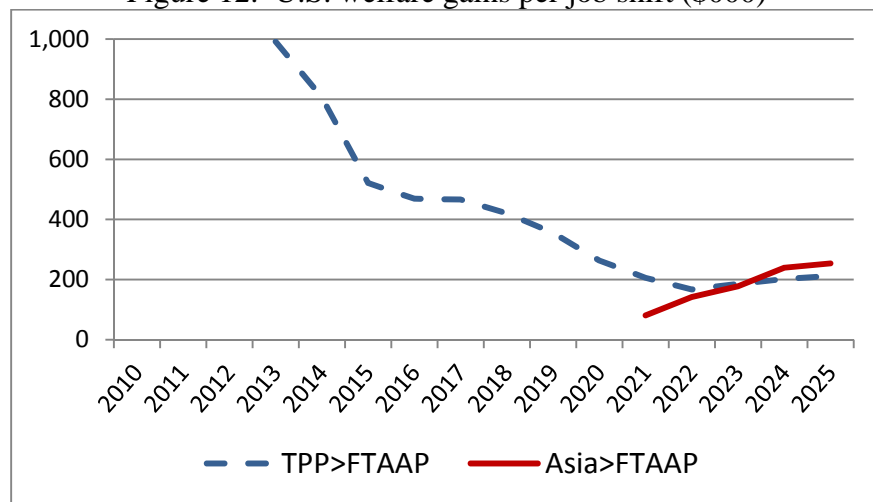
Source: authors' estimates. GBL 17sep/Lusa

In sum, the U.S. will benefit from pursuing the TPP from the outset, but its initial gains will be small. The prize for the United States—and as we will show also for China—is a Trans-Pacific or wider agreement. In the run-up to that agreement, competition between the tracks will force the United States and China to grant preferential access to their markets to most other important trading partners—but not each other. Eventually, they will have the most to gain from a deal.

The long-term interests of the United States suggest an active, subtle TPP policy. The United States needs to craft an agreement that is politically acceptable at home, ensuring market access for high technology industries and services. But the ultimate value of an agreement to the United States lies in the enlargement of the TPP and its consolidation with the Asian track. The TPP template must set ambitious targets for liberalization, but ones that other economies, including Japan and China, will eventually find acceptable—if not now, then five or ten years from now. This argues for early, informal consultations to minimize misunderstandings and tensions.

China

China is not likely to join the TPP track until an FTAAP, partly because it is unlikely to accept some of its provisions at this time, and partly because its membership would complicate the politics of an agreement in the United States and other countries. But China is the second-largest trading economy of the Asia-Pacific and has been a key protagonist of the Asian track since it launched negotiations with ASEAN in 2002. Following China's lead, Japan and Korea also concluded agreements with ASEAN. Consistent with recent policy announcements, we assume that China will now pursue a CJK agreement and an eventual EAFTA or wider agreement.

China's scale and development model require trade with many partners. Rebalancing China's economy calls for deeper interdependence with Asian economies, but the United States and Europe accounted for 49% of China's exports in 2010 and, according to our projections, will still account for 42% in 2025. Thus, both Asian and Trans-Pacific initiatives will have to remain on the "front burner" of Chinese policy.

Political interests should reinforce these economic objectives. China aims to avoid giving the impression of regional hegemony; its prospects are reinforced by economic development in its neighborhood; and it needs to devote attention to major internal economic and political challenges. These considerations support multi-track partnerships. China has repeatedly said that it regards regional integration as important to its "peaceful rise," and that it is committed to open regional efforts open that may include non-Asian partners (State Council 2011).

In retrospect, this multi-track strategy explains China's surprising initiative to conclude an FTA with ASEAN in 2002. China's trade with Southeast Asia was modest and its interests in production networks and raw materials are complementary with many Southeast Asian countries. The second step, which now involves an agreement with Japan and Korea, will be much more complicated. These large economies are more competitive with Chinese high technology industries and historical tensions with Japan add further complexity. The third step, involving deeper integration with the United States, will be even more difficult. But the study suggests that China and the United States share an economic stake in completing Trans-Pacific integration. The TPP and Asian tracks are setting bargaining positions for that prospect. In the meantime, China is likely to compete to attract TPP partners to its own regional grouping, and will lobby to

avoid a TPP that is incompatible with its positions on issues such as intellectual property rights, government procurement, labor, environment and state-owned enterprises. But China's concerns with these provisions may ease as its economy continues to develop and move toward a more market-oriented framework.

The time-path of China's gains on the Asian track are shown in Figure 13 (see also Table 11). They rise from $4 billion to $51 billion with the implementation of EAFTA in 2020, and further to $85 billion by 2025. These grow to around ½ percent of Chinese GDP. Some countries not participating in the Asian track (in particular the United States and Europe) would also benefit due to increased competition, more varieties and lower prices offered by the three. The TPP track shows trade diversion, resulting in negative welfare effects for China until the track leads to an FTAAP in 2020. In themselves, the two independent tracks cannot be seen as an attractive final objective for Chinese commercial policy.

Figure 13. China's welfare gains on alternative tracks ($bill.)
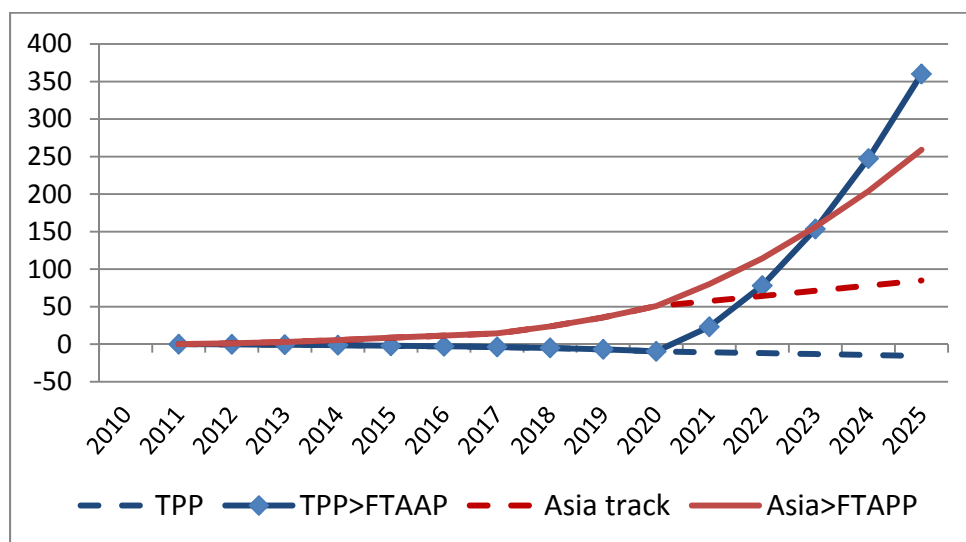
Source: authors' estimates. GBL 17sep/Lchn

China's largest gains will depend on a comprehensive Asia-Pacific bargain, perhaps reached by consolidating the Asian and TPP tracks. We estimate Chinese gains from the FTAAP reached from Asian track at $260 billion, or around 1½ percent of Chinese GDP. The gains would be still higher if the FTAAP agreement were reached from the more rigorous TPP track ($360 billion), and would fall between these levels if both tracks already exist. In all of these cases, China would be the largest beneficiary of the FTAAP, capturing 1/3 of total gains.

China will face modest adjustments on the Asian track, but job shifts would increase markedly with the FTAAP, and would be much larger than were estimated for the United States. China's adjustment results must be understood in the context of the transformation of its economy even under the baseline scenario; our model projects steady employment shifts from agriculture and labor-intensive industry to manufacturing and services. Moreover, by the end of the period, the Chinese labor force is projected to be declining. Around 4 million workers, or ½ percent of the

Chinese labor force, will need to change jobs each year. Rather than adding to this adjustment problem, the Asian track would reduce it in its early years, by providing markets for declining industries. Thus, it would complement rebalancing the Chinese economy away from exports to the West. The FTAAP would then restore longer-term trends; it would increase adjustment by ½ million jobs per year as it accelerates the shift from labor-intensive to technology-intensive and service sectors. These adjustments are generally consistent with Chinese development policy.

In sum, China would benefit from Asian regional integration because it delivers welfare gains, supports progress on political objectives, and facilitates rebalancing. But as the United States, China will benefit most from an Asia-Pacific or wider agreement. The two countries may be politically and economically competitive, but share powerful common economic interests.

With this in mind, some Chinese commentators have proposed a pro-active Chinese stance toward the TPP, involving active research and study, and perhaps even joining the negotiations early to influence its terms. This would be an important and interesting initiative, well supported by economic analysis, as developed in this study. For political reasons, it may be resisted by U.S. negotiators—given current economic and political circumstances in the United States, Chinese membership would make the ratification of an agreement difficult. In any case, China could encourage a cooperative outcome by shaping an open Asian track and by engaging TPP members informally—perhaps in the APEC context—before formal the negotiations become viable.

Japan

Japan faces large benefits and complicated choices, in the context of economic and political uncertainty. The Japanese labor force will likely decline by 12 percent over the next fifteen years; concerns run high about adjustment and unemployment. Given stable or declining markets, employment in several sectors will have to shrink. Background adjustment under the baseline scenario is high; around one percent of the labor force will need to shift jobs every year. Some employment cutbacks may involve retiring workers, but there is no necessary correspondence between structural shifts and retirement patterns. (We have no information on the age distribution of employment by sector to model such effects.)

Against this background, Japan is falling behind competitors such as Korea in developing new trade agreements. Japan has concluded an agreement with ASEAN, but not with the United States or Europe. Its business community is actively promoting trade negotiations both with Asian partners and with the United States. But the Tohoku tragedy has further unsettled politics, making commercial diplomacy even more difficult.

As for other countries, we explore an active trade policy for Japan: implementation of a CJK agreement by 2015 and EAFTA by 2020. We also assume that Japan will fully implement the TPP13 by 2020. These two tracks would generate Japanese gains of $27 billion and $32 billion, respectively (the lower dashed lines in Figure 14). Because Japan is assumed to join the Asian track before the TPP, its gains from the Asian track exceed those on the TPP track substantially in the early years. Implementing both tracks produces gains of $54 billion in 2020, close to the sum of gains on the two separate tracks (high dashed line).[21] After 2020, the transition to the

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[21] The most important overlap is that both provide preferential access to Korean markets.

FTAAP adds only modest additional benefits.

Figure 14. Japan's welfare gains on alternative tracks ($bill.)
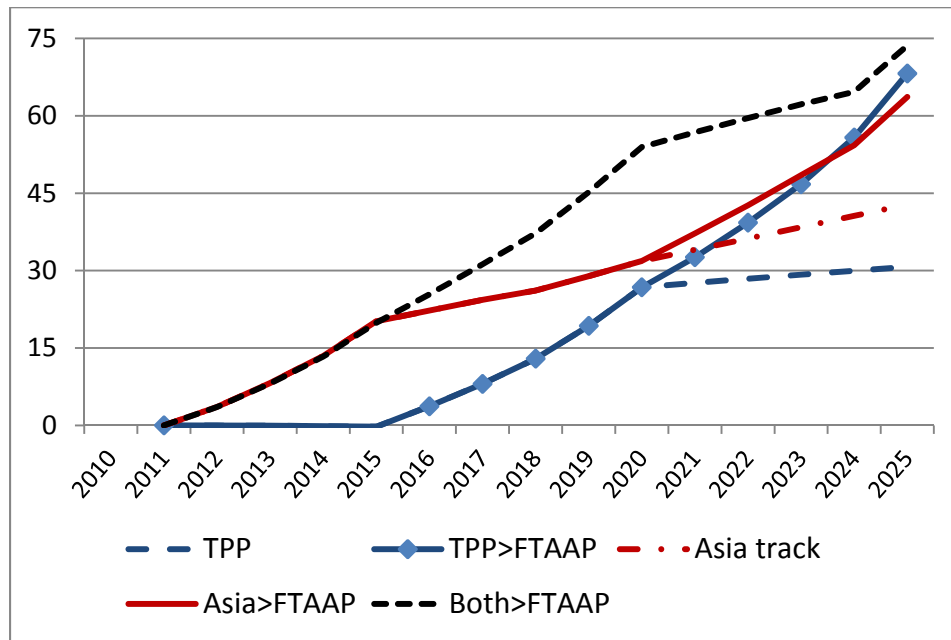
Source: authors' estimates. GBL 17sep/Ljpn

The gains from the two tracks involve political costs. The TPP would require concessions on agriculture and other areas of economic governance, perhaps including the postal savings system. Some observers assume that Japan will find it useful to avoid these costs by first joining the Asian track. But that decision carries its own costs, ranging from security tensions with China to differences on investment and intellectual property rights. It is unclear to what extent the two tracks, each of which would benefit from Japanese membership, will offer enticements.

To better understand the sensitive products issue, we constructed a scenario in which Japan joins the TPP earlier (leading to a "TPP10" agreement by 2012 and implementation by 2015), perhaps because exceptions from tariff cuts are granted for sensitive products.   In the "exceptions" scenario we reduced potential tariff cuts by 2/3 in each member's three most sensitive sectors. In the case of Japan, these were Rice, Wheat and Other Agriculture; in the case of the United States they were Apparel and Footwear, Textiles, and Other Agriculture. Results are in Table 13.

Consider first the effects of accelerating Japan's membership without any exceptions (reported in the first group of columns of Table 13). This case would add $26 billion to world welfare in 2015, including gains to Japan, Vietnam and the United States ($22 billion, $4 billion and $3 billion, respectively).   The benefits would be smaller in later years, since by 2020 Japan would have joined the TPP track also under the standard TPP scenario.

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Table 13.   Effect of exceptions for sensitive products in the TPP

	Japan joins TPP in 2015 Welfare gains (EV 2007$bill.)			Effect of exceptions Welfare gains (EV 2007$bill.)		
	2015	2020	2025	2015	2020	2025
TPP track economies	**2.9**	**1.6**	**1.6**	**-2.0**	**-5.0**	**-5.7**
United States	2.8	1.2	1.2	-1.4	-3.1	-3.6
Australia	0.6	0.3	0.3	0.0	-0.4	-0.5
Canada	-0.5	-0.1	-0.1	0.0	-0.3	-0.4
Chile	0.1	0.1	0.1	-0.1	-0.3	-0.4
Mexico	-0.5	-0.2	-0.2	-0.1	-0.3	-0.2
New Zealand	0.2	0.1	0.1	0.0	-0.1	-0.2
Peru	0.3	0.1	0.2	-0.4	-0.5	-0.4
Asian track economies	**-2.6**	**-2.2**	**-2.7**	**1.4**	**2.8**	**4.4**
China	-2.0	-1.8	-2.2	1.2	2.3	3.5
Hong Kong	0.0	0.0	0.0	0.0	0.0	0.0
Indonesia	-0.3	-0.2	-0.2	0.2	0.5	0.8
Philippines	-0.1	0.0	0.0	0.1	0.1	0.2
Thailand	-0.3	-0.2	-0.2	0.0	-0.1	-0.1
Two-track economies	**26.7**	**7.0**	**7.7**	**-11.2**	**-25.6**	**-31.8**
Brunei	0.0	0.0	0.0	0.0	-0.1	-0.1
Japan	22.1	3.7	3.7	-5.7	-7.4	-8.1
Korea	-0.5	-0.2	-0.2	0.1	-3.7	-4.1
Malaysia	1.0	0.8	1.0	-0.6	-1.4	-2.0
Singapore	0.1	0.1	0.2	-0.1	-0.4	-0.7
Vietnam	3.9	2.5	3.0	-4.8	-12.5	-16.9
Others	**-1.4**	**-0.7**	**-0.8**	**0.1**	**0.1**	**0.9**
Russia	0.0	-0.1	-0.1	-0.1	-0.1	-0.1
Chinese Taipei	-0.3	-0.2	-0.2	0.1	0.4	0.9
Europe	-0.2	0.0	0.0	-0.5	-1.8	-2.3
India	-0.1	0.0	0.0	0.0	0.0	-0.1
Other ASEAN	0.0	0.0	0.0	0.1	0.1	0.2
ROW	-0.8	-0.4	-0.5	0.5	1.4	2.3
WORLD	**25.6**	**5.7**	**5.9**	**-11.8**	**-27.7**	**-32.2**

Source: authors' estimates. GBL 17sep/tables

If exceptions for sensitive products need to be granted to secure Japan's early entry, the picture changes. In 2015 the exceptions would reduce world gains by $12 billion, to a net $14 billion. In later years, the negative welfare effects of the exceptions, which persist indefinitely, outweigh the positive effects of accelerated Japanese membership (-$28 billion vs. $6 billion in 2020, and -$32 billion vs. $6 billion in 2025), including for Japan itself.

World welfare gains in 2025 would be $104 billion on the standard TPP track, $110 billion if Japan's entry was accelerated, and $78 billion if the acceleration required exceptions for sensitive products. These comparisons suggest that the acceleration would benefit Japan and the world, but not if it required concessions in the quality of the agreement. However, if membership by Japan or other key countries *hinges* on such exceptions—if progress on the TPP cannot be made without greater flexibility—then the cost of significant exceptions is still

moderate compared to the potential gains (29% in this case). Of course, once a strategy of exceptions is admitted, it invites rent-seeking and becomes difficult to contain.

In sum, Japan would benefit substantially from both the Asian and TPP tracks; the case for more aggressive Japanese commercial policy is compelling. Of course, this will require overcoming political obstacles. For what it's worth, an agreement that allows Japan to make more modest or gradual adjustments in sensitive sectors would not be very costly to its partners. Japan's case also calls attention to the effects of a declining labor force; adjustment in that context becomes more difficult, which provides an additional argument for early trade policy actions.

Other economies

We develop results for 24 world regions. We briefly discuss five that illustrate important common patterns.

Vietnam is the largest beneficiary on TPP track. Five factors explain this somewhat surprising result: strong trade with the United States; high protection abroad against Vietnam's principal exports; strong competitive positions in industries, such as apparel and footwear, where China's comparative advantage is fading; high initial domestic protection; and powerful scale effects in its principal production clusters. The first three factors combine to boost Vietnamese exports and terms of trade under the TPP. The last two amplify these benefits by stimulating productivity gains. To be sure, Vietnam would face significant challenges in implementing an agreement that requires stringent disciplines in areas such as labor and government procurement. Vietnam's participation in the agreement is constructive and well founded, but it will need support for its capacity building and adjustment efforts.

Korea would also gain significantly from all tracks due to the importance of trade in its economy. But since many of its key markets are already covered by FTAs, the new gains will depend on improved access to Chinese and Japanese markets. The Asian track would provide a direct route to this goal, generating benefits of $43 billion by 2025 (see Table 7). This suggests that even if the CJK agreement does not materialize, Korea would probably still pursue an agreement with China. Once both the TPP and Asian tracks are implemented, Korea's additional gains from the FTAAP would be only $5 billion. From Korea's viewpoint, 90% of the benefits of region-wide integration could be achieved via the TPP and Asian agreements. After KORUS is approved and an agreement with China is reached, Korea's interests are likely to shift to global issues.

Thailand, which is not assumed to participate on the TPP track, would see large benefits from the FTAAP, estimated at 3.4% of GDP. These benefits would be more than twice as large as those on the Asian track alone. These policies would improve Thai productivity and increase exports of vehicles and electrical equipment. All this suggests that if the TPP track shows momentum, Thailand might well lobby to join it early. Thailand's position is similar to that of China—unless a region-wide agreement is concluded, it would be at a disadvantage compared to many competitors with preferential access to U.S. markets. Unlike China, it has greater freedom to pursue negotiations on both tracks.

Russia is not part of either track, but as a member of APEC it would be a candidate for the FTAAP. Until such an agreement is reached (2020 in our scenarios), Russia would suffer slight

trade diversion, leading to losses of around 0.1% of GDP. But as a member of the FTAAP, Russia's gains would rise to 5.5% of GDP, one of the largest rates among all participants. Its exports would rise by 16% relative to baseline. In effect, the FTAAP would offer Russia a dramatic entry into Trans-Pacific markets, while imposing policy changes that boost competitiveness. In turn, Russia would bring substantial assets through its mineral resources. Thus, Russia could emerge as the surprise champion of region-wide integration.

India was not assumed to participate in the agreements we examined. Since India competes with Asian economies, it experienced small trade diversion losses (around 0.2% of GDP in the case of the FTAAP). Moreover, it would also miss out on the domestic productivity benefits associated with liberalization. Thus, political pressures are likely to develop to include India in regional agreements, for example, by shifting the focus from EAFTA to CEPEA in the Asian track. India's policies may not be fully compatible with Asian or Trans-Pacific integration now, but domestic policy changes could make a big difference in the 15-year timeframe of this study.

In sum, the detailed results suggest interesting variations among countries. This means, on one hand, that the negotiations will have to bridge complex interests. Yet it also suggests many sources of support and possible champions for various initiatives.

8. Model sensitivity

A CGE model contains many assumptions and estimated parameters; potential sources of error include base year data, the specification of the model, and the specification of scenarios. Sensitivity analysis can identify the parameters that matter most to key results—especially trade and welfare effects—and provide a bracket for likely estimates. Our work on such sensitivity results is at an early stage. We report some results, mainly from other similar studies, and outline issues to be addressed in future work.

Assessing CGE errors is complicated by the fact that even if there is information available on errors in individual parameters (say, based on econometric studies), there is seldom evidence on covariances among their errors. This would be needed to judge whether errors in different parts of the model will cumulate or cancel in affecting aggregate results. To the extent that the assumptions and estimates of the model combine information from multiple, unrelated sources, it is not unreasonable to expect significant canceling.

Errors in basic economic data are likely to be small compared to other errors that arise in the simulations. GTAP's data system incorporates recent information from major, commonly used statistical sources. Much of this information—on national income and trade—is now reported fairly accurately for many countries. The "social accounting matrix" methodology of GTAP also imposes consistency checks and forces adjustments that are likely to improve the estimates.

Errors in scenario specification are addressed by simulating multiple scenarios. In addition to the scenarios already reported, several assumptions used to quantify the liberalization scenarios could be changed to gain insight into the effects of varying scenario assumptions (as described in Annex II). This will be an important part of future work.

Errors in model specification can be tested by changing structural parameters. Three sets of parameters are particularly important to the results: elasticities of substitution of different varieties of goods, parameters that describe the distribution of productivity across firms, and assumptions about the role of fixed costs associated with international trade.

Zhai (2008) reports sensitivity results for these parameters using a model that is structurally similar to the one applied in this study. In each case, he examines how parameter changes will affect predictions for the effects of trade liberalization—in those experiments, a 50% cut in MFN tariffs by all world regions. He examines the effects of this policy scenario with a base model and then with models based on alternative parameters.

First, he increases (reduces) the elasticity of substitution among varieties by 1/3—a magnitude similar to the standard error estimated in econometric studies. This parameter change reduces (increases) the welfare gains estimated to result from liberalization by about 10% and reduces (increases) the trade gains by about 7.5%.[22] Second, he reduces by 1/3 a parameter that determines heterogeneity in firm productivity (in effect, he makes firms more homogeneous). This reduces the estimated welfare and trade effects of liberalization by about 1/3.[23] Third, he changes parameters that determine the division of trade costs between fixed and variable costs in calibrating the model. In this case, he finds negligible effects on the welfare and trade predictions. In sum, Zhai (2008) finds that reasonable changes in parameters can lead to estimated results that differ by as much as 1/3 from the standard model.

For comparison, the USITC's (2010) general equilibrium study of the KORUS agreement uses a somewhat different model (a single-period GTAP model with more conventional trade structure) and conducts sensitivity analysis by changing substitution elasticities by one standard deviation. (In that model these elasticities apply to domestic and imported varieties.) The results change estimated welfare and trade effects by roughly plus-or-minus 7.5% from those computed with their standard model.

The current model has a larger error range than the GTAP model because it takes more channels of trade effects into account. But there is no easy way to judge the specification errors that might be involved in adopting the simpler basic GTAP model, in comparison to the comprehensive model used in this study. To be sure, a growing body of empirical research suggests that firm-heterogeneity effects such as those incorporated in the present model are important in driving gains from trade.

9. Conclusions

This study examines how two emerging tracks of agreements—the TPP and Asian tracks—might consolidate the "noodle bowl" of Asia-Pacific trade agreements and provide pathways to region-wide free trade. A speculative, but compelling story has emerges. Each track is likely to generate substantial gains as well as incentives for enlargement. Each track is also likely to

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[22] In the Melitz framework, a variety-loving (low substitution elasticity) economy benefits more trade from liberalization than a variety-shunning economy, because liberalization improves access to foreign varieties.
[23] The logic is that inter-firm shifts caused by trade liberalization have more limited productivity benefits.

stimulate progress on the other. Although many outcomes are possible, from the perspective of economics the most plausible scenario is that the tracks will evolve in parallel and eventually consolidate. That end point—a region-wide agreement such as the FTAAP—would be very attractive, yielding benefits comparable to those that could have been obtained from a successful Doha Round.

The simulations provide insight on how such tracks might progress. Initially, the giant economies of the United States and China would be the magnets for market integration, attracting smaller economies to each track. From the viewpoint of these large countries, the short-term benefits would be modest, but the tracks would create templates that influence their gains from wider regional integration in the future. To small countries the agreements would offer significant immediate benefits, especially if they can join both tracks.

As larger economies such as Japan and Korea join one or both tracks, the value of membership in the tracks would grow. This dynamic would stimulate enlargement, expanding gains on both tracks. The tracks would offer substantial non-overlapping benefits to members. The tracks are likely to compete with each other for members in order to amplify their scale and momentum. (For example, stepped-up interest in the CJK agreement may be already due to the TPP negotiations.) They are also likely to have different templates. These competitive interactions can lay the foundations for region-wide agreements, but can also raise the risks of hardening, incompatible approaches to integration.

Along a two-track trajectory, many economies are likely to join both tracks and gain preferential access to virtually all Asia-Pacific markets. For them, the two tracks would provide benefits almost as great as a region-wide or even global agreement. That would leave the United States and China among the relatively few countries that do *not* have preferential access to each other's markets. For them, the lion's share of the benefits from regional integration would still lie ahead, in the consolidation of the Asian and TPP tracks.

The eventual consolidation of the tracks, say a decade or so from now, should generate greater gains at lower costs for the United States and China than such an agreement would today. By then, given its present pace of development, China will be more likely to benefit from provisions that the United States advocates today. The two countries will have gained experience with regional trade agreements, and will have already completed some of the economic adjustments that will be required by a region-wide agreement. Much will still depend on their political relationship, but under reasonable conditions a single, region-wide free trade area should be attractive to both. In turn, successful Asia-Pacific integration should have positive domino effects across the world.

From a policy perspective, the more that can be done to increase the chances for and to hasten eventual consolidation—e.g. avoiding hard positions on fundamentally incompatible templates— the better. Efforts can be made on both tracks to make provisions as complementary as possible. It would be especially useful to develop interactions between the tracks through informal channels—perhaps joint studies and non-binding forums such as APEC—that minimize misunderstandings and guide the technical development of each toward convergence.

Beyond this dynamic, the findings highlight several important features of Asia-Pacific integration. First, the simulations show that each track will benefit all members, but indicate that the benefits will be relatively small until the agreements expand. The early stages of the TPP would favor smaller, low-income economies such as Vietnam; the middle stages larger countries such as Japan and Korea; and the final stages the United States and China. Throughout, the gains would involve primarily trade-creation, since the various groups of Asia-Pacific economies included in the scenarios have the characteristics of "natural" trading blocs that are based on efficient specialization.

Second, the findings illustrate how different pathways might shape the template for region-wide integration. A template based on the TPP track, for example, should generate more rigorous disciplines, particularly in service-oriented sectors important to advanced countries, than the Asian-track. The TPP track is also likely to feature provisions on social issues that help to attract political support for intensive integration between emerging and advanced economies. Since the TPP track would require deeper liberalization than the Asian track, it would generate greater benefits for all countries. The tracks will define a "disagreement point" in the game in which an ultimate Asia-Pacific agreement is determined. The stronger a track when those negotiations start, the more impact it is likely to have on the template of the consolidated agreement.

Third, the study suggests that adjustment costs should be manageable, even in the short run when economies experience the greatest impact from integration. (We computed adjustment explicitly as the sum of inter-sectoral job shifts.) In the peak adjustment period, most trade agreements produce benefits equivalent to several years of compensation for each job shifted from one sector to another. Adjustment is not unique to trade liberalization; technological and other structural changes generate adjustment even along the baseline, especially in economies with a slowly growing or declining labor force. In most cases the adjustments induced by trade policy are small compared to those background adjustments. In some cases policy even reduces adjustment by providing new markets for products with insufficient or declining baseline demand.

Taken together, the results are encouraging: the two integration tracks promise steady gains that eventually become large, dynamic effects that stimulate enlargement, and incentives for the United States and China to cooperate. Whether the political environment will support such an optimistic trajectory remains to be seen. Economic interests are not the whole story, but they matter. Economics favors Asia-Pacific economic integration and the TPP and Asian tracks appear to provide complementary (if also competitive) pathways toward it.

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Appendix I: The CGE model

Data and dimensions

The model is based on the preliminary GTAP 8 dataset for 2007. It consists of 24 regions (Table I-1) and 18 sectors (Table I-2).

Table I-1. Model regions

No	Region
1	Australia
2	New Zealand
3	China
4	Hong Kong
5	Japan
6	Korea
7	Chinese Taipei
8	Indonesia
9	Malaysia
10	Philippines
11	Singapore
12	Thailand
13	Vietnam
14	Brunei
15	India
16	Canada
17	United States
18	Mexico
19	Chile
20	Peru
21	Russia
22	Europe*
23	Other ASEAN**
24	ROW

*   Europe 25, Iceland, Switzerland.
**   Cambodia, Lao, Myanmar.

Source: authors. Simdata/sectors

Table I-2. Model sectors

No	Sector
1	Rice
2	Wheat
3	Other agriculture
4	Mining
5	Food, beverages
6	Textiles
7	Apparel, footwear
8	Chemicals
9	Metals
10	Electrical equipment
11	Machinery
12	Transport equipment
13	Other manufacturing
14	Utilities
15	Construction
16	Trade, transport, communications
17	Private services
18	Government services

Source: authors. Simdata/sectors

Production and trade

Agriculture, mining and government services sectors are assumed to exhibit perfect competition. In each of these sectors, a representative firm operates under constant returns to scale technology. Trade is modeled using the Armington assumption for import demand. Manufacturing and private services are characterized by monopolistic competition, and their structure of production and trade follows Melitz (2003). Each sector with monopolistic competition consists of a continuum of firms that are differentiated by the varieties they produce and their productivity. Firms face fixed production costs, resulting in increasing returns to scale. There are also fixed costs and variable costs associated with exporting activities. On the demand side, agents have Dixit-Stiglitz preference over the continuum of varieties. As each firm is a monopolist for the variety it produces, it sets the price of its product at a constant markup over marginal cost. A firm enters domestic or export markets if and only if the net profit generated from such sales is sufficient to cover fixed cost. This zero cutoff profit condition defines the productivity thresholds for firm's entering domestic and exports markets, and in turn determines the equilibrium distribution of non-exporting firms and exporting firms, as well as their average productivities. Usually, the combination of a fixed export cost and a variable (iceberg) export cost ensures that the exporting productivity threshold is higher than that for production for domestic market, so that only a fraction of firms with high productivity export. These firms supply for both domestic and export markets. The number of firms in the monopolistic sectors is assumed to be fixed.

Production technology in each sector is modeled using nested constant elasticity of substitution (CES) functions. At the top level, the output is produced as a combination of aggregate intermediate demand and value added. At the second level, aggregate intermediate demand is split into each commodity according to Leontief technology. Value added is produced by a capital-land bundle and aggregate labor. Finally, at the bottom level, aggregate labor is decomposed into unskilled and skill labor and the capital-land bundle is decomposed into capital and land (for the agriculture sector) or natural resources (for the mining sector). At each level of production, there is a unit cost function that is dual to the CES aggregator function and demand functions for corresponding inputs. The top-level unit cost function defines the marginal cost of sectoral output.

Income distribution, demand and factor markets

Incomes generated from production accrue to a single representative household in each region. A household maximizes utility using Extended Linear Expenditure System (ELES), which is derived from maximizing the Stone-Geary utility function. The consumption/ savings decision is completely static. Savings enter the utility function as a "good" and its price is set as equal to the average price of consumer goods. Investment demand and government consumption are specified as a Leontief function. In each sector a composite good defined by the Dixit-Stiglitz aggregator over domestic and imported varieties is used for final and intermediate demand.

All commodity and factor markets are assumed to clear through price adjustment. There are five primary factors of production. Capital, agricultural land and two types of labor (skilled and unskilled) are fully mobile across sectors within a region. In natural resource sectors of forestry, fishing and mining, a sector-specific factor is introduced into the production function to reflect the resource constraints. For all primary factors, their stocks are fixed.

Macro closure

There are three macro closures in the model: the net government balance, the trade balance, and the investment and savings balance. We assume that government consumption and saving are exogenous in real terms. Any changes in the government budget are automatically compensated by changes in income tax rates on households.

The second closure concerns the current account balance. In each region, the foreign savings are set exogenously. With the price index of OECD manufacturing exports being chosen as the numéraire of the model, the equilibrium of foreign account is achieved by changing the relative price across regions, i.e. the real exchange rate.

Domestic investment is the endogenous sum of household savings, government savings and foreign savings. As government and foreign savings are exogenous, changes in investment are determined by changes in the levels of household saving. This closure rule corresponds to the "neoclassical" macroeconomic closure in the CGE literature.

Appendix II: Quantifying the effects of agreements

We estimate the effects of 48 trade agreements, consisting of 38 agreements already concluded but not necessarily fully implemented, and 10 prospective agreements. Existing agreements are listed in text Table 1 and prospective agreements in text Table 6. The effects of each agreement are simulated by adjusting annual baseline values of the following four sets of parameters:

1. Tariffs
2. Utilization rates of tariff preferences
3. Non-tariff barriers
4. Costs associated with meeting rules of origin

We discuss each adjustment below. Broadly, our methodology is similar to that of Findlay and Urata (2010) and involves assigning "scores" to issues covered in the agreements and then mapping the scores into quantitative effects on model parameters using a "policy coefficient" matrix. These operations are inherently subjective. Accordingly, we adopt a methodology that easily handles alternative assumptions, and attempt to present the assumptions that we do use as clearly as possible. The framework is designed to make it possible to improve the simulations as new information becomes available on the structure of prospective agreements or on scores that capture their effects, and to test the implications of alternative assumptions for the results.
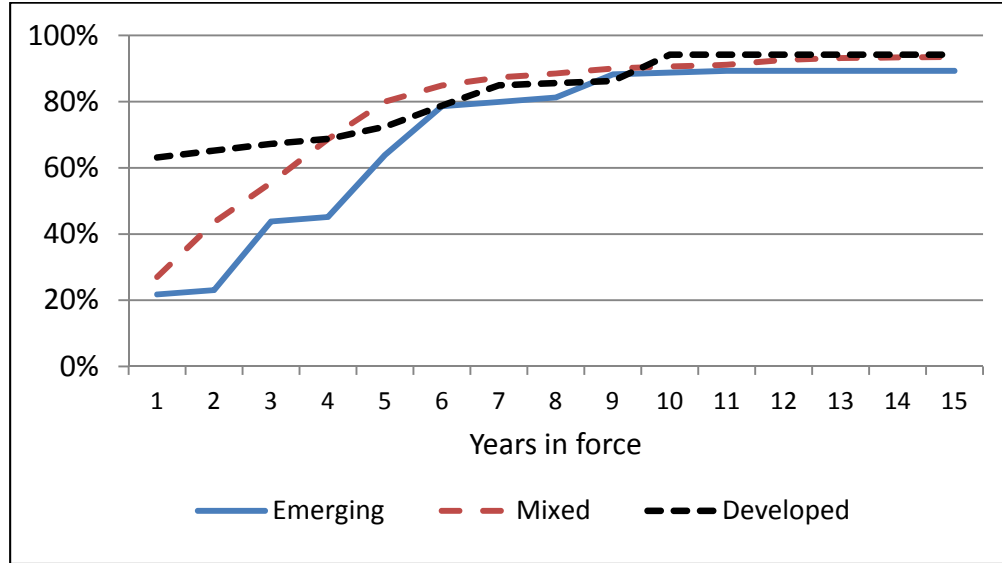
Tariffs

Regional and bilateral trade agreements typically specify preferential tariff schedules in great detail, often at the 8-digit tariff line level. But this information is often available only in the form of legal document and is very difficult to use. In many cases, the schedules do not even specify the base tariff rate to which the reductions will apply. The schedules are not usually presented in a format that would facilitate machine-based access and analysis[24] and we did not have the resources to translate this large body of information into such formats.

We used detailed textual information on the tariff schedules of several important agreements to develop time-profiles of reduction paths over their implementation periods. For example, in analyzing such an agreement we might have determined that 40% tariff lines were initially zero, 40% were to be reduced immediately to zero, 5% were to be cut by 20% every year over the first five years, and so on. We aggregated these tariff groups into an overall tariff reduction path for each agreement. The resulting reduction paths are shown in Figure II-1. We assumed that the reduction paths for other agreements followed the paths derived from actual agreements for the same or similar countries.

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[24] There are several sources of information on regional trade agreements, including WTO, ESCAP, ADB-ARIC and APEC, but these sources generally compile the documents involved in the agreements without further analysis or standardization. An APEC effort to compile information on regional trade agreements represents a welcome step in this direction, but so far it has not resulted in a machine-accessible database.

Figure II-1. Tariff reductions in agreements among different economies

Source: authors' estimates. Simdata/tariff models

In the simulations, the tariff reduction paths (such as those shown in Figure II-1) were applied to base tariff rates derived from the GTAP dataset. The complication is that the GTAP data show applied tariffs, while the agreements specify reductions in MFN rates, which may be higher than applied tariffs because of reductions are already being applied under existing bilateral or regional agreements. We therefore imputed the MFN rate from the applied tariff rate data taking into account information on preferential reductions that were already in effect at that time. For example, if a bilateral trade flow had an applied tariff of 15% in 2007 and benefited from a 25% preference reduction in that year (based on our analysis of regional and bilateral agreements in force), then we imputed the MFN rate to be 20% (=15/0.75).[25]

At times more than one agreement covers trade between a pair of countries. In these cases, we assume that the tariff rate applied is the lowest of applicable rates.

Utilization of tariff preferences

The applied tariff rate is determined by three factors: the MFN rate, the preferential reduction available under the agreements in force, and the extent to which preferential rates are utilized. There is considerable evidence indicating that FTAs are underutilized. Kawai and Wignaraja (2011) find that incomplete utilization of FTAs is explained by the administrative costs of utilization, the size of the reduction offered by the agreement, and the severity of the rules of origin (ROOs).

We model the utilization rate for a given agreement in terms of three elements of the agreement:

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[25] This example assumes that preferences are fully utilized. In practice these calculations require additional assumptions about the utilization rate of preferences as described below.

- Size of the preferential tariff reduction
- Restrictiveness of the ROO
- Size of the agreement (with larger agreements leading to higher utilization)

A score of 1-5 is assigned to each factor and the factors are averaged to create a composite. This score is then transformed into a utilization rate using the formula:

(II-1) $\mu = 0.8 * (s/5)$

where μ = utilization rate
       s = utilization score (1-5)

The rate has a maximum value 80% and a minimum value of 16%. The values assigned to different agreements are shown in text Table 6.

We are not aware of other studies that use such an approach to incorporate utilization rate changes into a CGE analysis of preferential agreements. One result of this approach is that the applied tariff rate may change for a bilateral trade flow even if the preferential tariff reduction is not changed, if some factor results in a higher utilization rate. For example, if an existing bilateral agreement is included in a new, larger agreement such as the TPP (or later FTAAP), the new agreement may generate higher utilization rates due to its larger size which permits cumulation of inputs across more countries.[26] This will result in lower applied tariffs and more trade among the partners.

Non-tariff barriers

Non-tariff barriers are represented in the model as "iceberg costs," that is, factors that reduce the productivity of protected activities relative to imports from efficient partners.[27] Tariff equivalents for non-tariff barriers for goods are based on work by the World Bank (Kee et al. 2009) and Helble et al. (2007) reported in Table II-1, and for services on regressions models developed by Wang, Mohan and Rosen at the Peterson Institute for International Economics for services (Table II-2).[28]

The estimated NTBs are assumed to represent barriers that were applied to all trade partners *prior* to any of the bilateral or regional agreements simulated in this analysis. They are reduced thereafter in amounts described below. In 2007, therefore, the NTBs that apply to a particular bilateral trade flow are assumed to be the base NTBs, reduced when appropriate by the effect of existing bilateral or regional agreements.[29]

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[26] This assumes that each FTA allows full cumulation, e.g. the ROO counts inputs from any member as originating in the FTA.

[27] Some studies break the effects of NTBs into productivity losses such as those used here, and rents. From a modeling standpoint, both approaches generate similar increases in trade, but the elimination barriers leads to improvements in productivity only to the extent that it eliminates inefficient production rather than rents.

[28] Other studies of interest include Bora et al. (2002) and Feridhanusetyawan (2005).

[29] Some analysts have suggested that a portion of NTB reductions achieved in bilateral or regional agreements, particularly in services, would generate MFN benefits, and hence would also improve access for trade partners outside the agreement. That effect is not modeled in this study.

Table II-1. Estimated non-tariff barriers for goods

	World Bank OTRI		Transparency index		Total index	
	Agriculture	Manu-factures	Agriculture	Manu-factures	Agriculture	Manu-factures
Australia	0.159	0.039	-	-	0.159	0.039
Brunei[5]	0.103	0.024	0.448	0.104	0.551	0.128
Canada	0.080	0.013	-	-	0.080	0.013
Chile	0.093	0.032	-	-	0.093	0.032
China	0.102	0.051	0.232	0.116	0.334	0.167
Chinese Taipei[1]	*0.247*	*0.031*	-	-	0.247	0.031
Hong Kong, China	0.049	0.002	-	-	0.049	0.002
India	0.109	0.020	0.491	0.090	0.600	0.110
Indonesia	0.147	0.083	0.150	0.085	0.297	0.168
Japan	0.247	0.031	-	-	0.247	0.031
Korea[1]	*0.247*	*0.031*	0.006	0.001	0.253	0.032
Malaysia	0.349	0.149	0.106	0.045	0.455	0.194
Mexico	0.229	0.109	0.147	0.070	0.376	0.179
New Zealand	0.206	0.069	-	-	0.206	0.069
Peru	0.127	0.048	0.291	0.110	0.418	0.158
Philippines	0.343	0.152	0.409	0.181	0.752	0.333
Singapore[2]	*0.049*	*0.002*	-	-	0.049	0.002
Thailand	0.058	0.011	0.467	0.089	0.525	0.100
United States	0.110	0.037	-	-	0.110	0.037
Vietnam	0.283	0.183	0.500	0.324	0.783	0.507
Other ASEAN[3]	*0.152*	*0.127*	0.217	0.181	0.369	0.308
Russia	0.172	0.105	0.711	0.434	0.883	0.539
European Union	0.257	0.042	-	-	0.257	0.042
Rest of World[4]	*0.124*	*0.057*	0.172	0.079	0.296	0.136

Sources: Kee (2009) and Wilson (2008). Italics denote estimates by authors.
Notes: (1) based on Japan; (2) based on Hong Kong, China; (3) based on Lao only;
(4) based on world average; (5) based on ASEAN average. NTB Barriers apr11/data

Table II-2. Estimated non-tariff barriers for services

	Utilities	Construction	Trade, transport, comm.	Private services	Public services
Australia	0.145	0.123	0.123	0.124	0.159
Brunei	0.268	0.245	0.244	0.245	0.284
Canada	0.139	0.117	0.117	0.118	0.153
Chile	0.223	0.200	0.199	0.200	0.238
China	0.781	0.748	0.747	0.749	0.803
Chinese Taipei	0.191	0.168	0.168	0.169	0.205
Hong Kong, China	0.030	0.030	0.030	0.030	0.030
India	0.958	0.921	0.920	0.922	0.982
Indonesia	0.958	0.921	0.920	0.922	0.982
Japan	0.151	0.129	0.129	0.130	0.165
Korea	0.232	0.209	0.208	0.210	0.247
Malaysia	0.268	0.245	0.244	0.245	0.284
Mexico	0.420	0.394	0.393	0.394	0.438
New Zealand	0.028	0.016	0.022	0.009	0.040
Peru	0.337	0.312	0.311	0.313	0.353
Philippines	0.529	0.500	0.499	0.501	0.548
Singapore	0.030	0.030	0.030	0.030	0.030
Thailand	0.420	0.394	0.393	0.394	0.438
United States	0.045	0.031	0.036	0.026	0.058
Vietnam	0.574	0.544	0.544	0.545	0.593
Other ASEAN	0.469	0.442	0.441	0.442	0.487
Russia	0.489	0.461	0.461	0.462	0.508
European Union	0.051	0.037	0.041	0.032	0.064
Rest of World	0.218	0.199	0.199	0.198	0.231

Source: based on gravity model regression studies of service trade flows conducted by Wang, Mohan and Rosen at the Peterson Institute for International Economics. These estimates report the sum of country and sector dummy variables estimated by the regressions. Some missing cells were filled in with data from similar economies.   Service barriers apr11/table

Reductions in NTBs are calculated as a product of three factors: (i) scores of each agreement in 24 issue areas[30], (ii) policy coefficients that translate scores into reductions in different NTBs, and (iii) maximum reduction rates for each type of NTB. These factors are multiplied together to yield NTB reduction factors:

(II-2) $r = \lambda * P * S$

where r = NTB reduction factors ($N_i \ x \ N_a$)
      λ = maximum NTB reduction rates (diagonal matrix $N_i \ x \ N_i$)
      P = policy coefficients that map issues scores into NTB reductions ($N_i \ x \ N_p$)
      S = scores (0-1) matrix that measures issue coverage of agreements ($N_p \ x \ N_a$)
      N_i = number of NTB categories = 2 (goods and services)
      N_p = number of policy issues areas = 24
      N_a = number of agreements = 49

The scores matrix S consists of values assigned to agreements in each of 24 issue areas ranging from 0 to 1. These scores reflect subjective assessments of the coverage of the issue in the agreement, typically based on the extent of the discussion. Useful data for this kind of analysis is available from individual trade agreements and APEC (2008). Since this task was completed, the WTO (2011) has reported similar scores that could prove valuable for future work.

The policy coefficient matrix P has rows that sum to 1; its non-zero entries represent policy weights for various issues (that is, FTA provisions) in reducing a particular NTB. At this time, we distinguish only between goods and service NTBs; further distinctions could be made in future work. Most but not all such policy coefficients are positive. A large, positive coefficient means that an issue will have a significant impact in reducing the barrier (for example, the investment issue area has a large role in determining service NTBs). A few coefficients are negative, indicating that high scores on some rules will tend to increase rather than reduce barriers to trade.

To see how this formula works, consider an agreement with perfect scores of 1.0 in all issue areas (the agreement's column of the S matrix consists of 1's). Then the product $P * S$ will yield a matrix of ones. If we further assume that NTBs can be fully eliminated by policy ($\lambda = I$) then equation (2) yields 100% reduction (full elimination) of all NTBs. If only 50% of NTBs are assumed to consist of barriers that can be eliminated by trade policy changes ($\lambda = 0.5I$) then the reduction associated with perfect scores will be 50%. And if we assume that an agreement is only half-perfect (its column in the S matrix has 0.5 values) then the NTB reductions associated with it will be only 25%.

The P and S matrixes used in the simulations are presented in Tables II-3. The λ factor indicating the maximum potential reduction of NTBs through policies was set at 0.67. The results calculated using Equation (II-1) and Equation (II-2) and applied in the simulations—the utilization rates μ and the r matrix—were reported in the text in Table 6.

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[30] This list of issues was constructed from early press reports of the TPP negotiations. Based on later reports, the list was been expanded to the 26 issues reported in Table 1. The quantitative results reported in this paper are still based on an initial 24 issues; the two issues added later will be incorporated in future updates.

Table II-3. Policy weights and scores for trade agreements

	Issue Area	Policy weights (*P'*)			Average scores (*S*)	
		Goods NTBs	Service NTBs	FDI barriers	Prior U.S. agreements	Prior CJK agreements
1	Goods	0.15	0.00	0.00	0.96	0.78
2	Agriculture	0.08	0.00	0.00	0.60	0.02
3	Trade in services	0.00	0.17	0.14	0.96	0.78
4	Safety standards	0.00	0.00	0.00	0.10	0.02
5	Technical barriers to trade	0.04	0.00	0.05	0.80	0.39
6	Competition	0.04	0.08	0.09	0.96	0.42
7	Intellectual property	0.04	0.04	0.14	0.96	0.52
8	Financial services	0.00	0.12	0.09	0.80	0.23
9	Investment	0.00	0.17	0.18	0.96	0.65
10	Labor	-0.08	0.00	0.00	0.80	0.02
11	Environment	-0.08	0.00	0.00	0.80	0.04
12	Government procurement	0.15	0.12	0.09	0.96	0.42
13	Sanitary and phytosanitary measures	0.04	0.00	0.00	0.76	0.39
14	Dispute settlement	0.08	0.08	0.09	0.96	0.72
15	Rules of Origin	0.08	0.00	0.00	0.96	0.74
16	Trade Remedies	0.04	0.00	0.00	0.96	0.52
17	Customs administration	0.15	0.00	0.00	0.96	0.60
18	Logistics (inspection)	0.12	0.00	0.00	0.30	0.04
19	Movement of natural persons	0.04	0.08	0.09	0.56	0.47
20	Institutional arrangements	0.04	0.08	0.05	0.66	0.22
21	Primary industry	0.00	0.00	0.00	0.20	0.00
22	Culture	0.00	0.04	0.00	0.00	0.04
23	Science and technology	0.00	0.00	0.00	0.08	0.28
24	Small and medium size enterprises	0.08	0.00	0.00	0.00	0.28
	Total / Average	1.00	1.00	1.00	0.67	0.36

Source: authors' estimates.   Simdata/t-iss

Note: These are the *P* matrix (transposed) and the *S* matrix, respectively.

The policy coefficient matrix *P* in Table II-3 shows, for example, that in determining the reductions to be applied to NTBs affecting goods trade, we assign the greatest weight to provisions dealing with goods, government procurement, customs administration and logistics. These weights are applied to the scores of agreements in each issue areas. Examples of such scores (columns of the *S* matrix) are shown in the right-hand-side columns of Table II-3. They indicate significant differences between prior agreements involving the United States and Asian-track countries; on average, Asian-track scores are only half as high. As might be expected, the prior U.S. scores are especially high relative to the Asian track for social issues such as labor and the environment. Asian scores are higher only for a few issues, such science and technology and small and medium enterprises. Neither track has much prior experience with provisions on safety standards, logistics and culture. These differences in scores, when weighted by the coefficients of the *P* matrix, explain the larger NTB reductions applied in simulations of the TPP track (51%) than of the Asian track (35%), as reported in text Table 6.

The results presented in text Table 6 show the ultimate parameter changes that result from the full implementation of an agreement. Each agreement is assumed to be implemented over five

years (with 20% of the reduction applied in the first year, 40% in the second year, and so on) beginning in the year that it comes into force.   In cases where a bilateral trade flow is subject to multiple agreements the largest of projected reductions is used.

Costs associated with meeting rules of origin

For the most part, FTAs lower barriers and improve productivity. However, trade diversion to inefficient regional suppliers works in the opposite direction. Such effects are automatically taken into account by CGE simulations, since all sourcing decisions (by households purchasing consumption goods and by industries purchasing inputs) respond to relative prices that incorporate the effects of preferential barriers. One effect, however, is not automatically modeled: a firm may incur additional costs in order to qualify its exports for preferential tariffs. These additional costs include the administrative burden of meeting ROO certification, but more importantly they may involve using costlier domestic or regional inputs in order to satisfy ROO requirements.

We represent these costs by *adding* iceberg costs to bilateral trade flows within an FTA. The size of the productivity penalty assumed to depend on the size of the tariff preference, since this is the benefit of meeting the ROOs. We calculate the penalty attached to each bilateral trade flow using the formula:

(II-3) $q = \delta * \mu * \Delta t$

where q = productivity cost of meeting ROOs
δ = loss factor,
μ = utilization rate of the tariff preference
Δt = preferential tariff reduction

The loss factor δ is set to ½ for small agreements but is assumed to decline to 0 for large agreements such as the FTAAP, since in that setting regional sourcing options should permit fully efficient input decisions.