

## The New Landscape of Trade Policy and Korea's Choices

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Two mega-regional negotiations are changing the landscape of Asia Pacific trade policy: an Asian track centered on ASEAN (the Regional Comprehensive Economic Partnership or RCEP), and a Trans-Pacific track centered on the Trans-Pacific Partnership (TPP) among 12 economies, including the United States, which Korea is expected to join. Modeling results suggest that both would generate substantial benefits for Korea and the global economy. From Korea's viewpoint, the agreements would establish new FTAs with China, Japan and smaller economies, improve the utilization of FTAs by permitting the regional cumulation of inputs, and help to upgrade some Korean FTAs to more rigorous standards. By participating in these agreements, Korea could also help to guide them toward inclusive, high-quality regional outcomes. As one of the region's most open and agile economies, Korea has a large stake in regional integration and would be well advised to pursue both tracks.

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JEL Classification: F12, F13, F14, F15, F17

The terrain of global trade rules is shifting. Top-down global negotiations – the source of the remarkable trade liberalization of the past half century – have succeeded, after two decades of effort, in generating a hopeful outcome at the Bali ministerial meetings of the World Trade Organization (WTO). Nevertheless, these achievements came at considerable cost and are deeply scaled back from the Doha Round's early ambitions. Meanwhile, hundreds of small bilateral agreements have created a noodle-bowl of overlapping rules.

Against this background, two huge negotiations have emerged in the

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Asia-Pacific: an “Asian track” centered on the Regional Comprehensive Economic Partnership (RCEP), and a “Trans-Pacific track” centered on the Trans-Pacific Partnership (TPP), which also includes the United States. Partly due to these initiatives, negotiations have now also started between the European Union and the United States, and the European Union and Japan. Countries producing nearly 80 percent of world GDP are engaged in one or more of these negotiations.<sup>1</sup>

If these and other mega-regional negotiations succeed, they will become the new engine for drafting global trade rules. The Trans-Pacific and Trans-Atlantic negotiations, were they to adopt similar rules, would be especially influential. But if the mega-regionals fail, they would spell an end, at least for now, to progress on updating rules. This could mean rising economic tensions and further deceleration in trade growth.

As one of the world’s most open and agile economies, Korea has a large stake in the outcome. Korea has hedged its bets by launching in 2003, and by now mostly executing, a “roadmap” for free trade with all of its major trade partners (Bark, 2012). Korea has concluded high quality trade agreements with the European Union, the United States and many Asian neighbors, and its current negotiations with China are expected to be successful. Nevertheless, Korea would benefit greatly from an open, liberal region-wide trade regime.

How much effort should Korea now invest in the RCEP and TPP? Its direct gains, although significant, would not be as large as for some other countries, since the new agreements would partly overlap Korea’s existing FTAs. (One important new element in both agreements, however, would be free trade with Japan.) At the same time, Korea would find RCEP and TPP easy to sign, since it has already accepted high-quality rules in its US and European agreements.

This unusual position gives Korea a catalytic role in shaping outcomes. As a first-mover and valued partner in regional agreements, it could help steer Asia-Pacific negotiations toward coherent regional and perhaps global results. Korean leverage will be greatest at the outset of each negotiation – as in the current stage of RCEP – when key features of the agreement are still fluid. Of course, given the complexity and effort involved in each negotiation, another alternative is to sit back, hoping that Korea’s hedging strategy will safeguard its most important interests regardless of how the mega-regional agreements turn out.

This paper is based on a rigorous analysis of trade policy options, but it is

<sup>1</sup> Based on our model data for 2010 in 2007 dollars.

ultimately designed to inform urgent policy choices. To accomplish that objective, the paper considers questions that cannot be answered solely with quantitative results and depend on judgments. It argues that an active Korean policy role could help to realize direct gains from the new mega-regional agreements, as well as help to ensure a cooperative regional outcome. This would require forceful Korean participation in the RCEP and TPP negotiations (the latter is likely but not certain at this writing<sup>2</sup>) in part to advocate their convergence. The paper examines these options using the results of a detailed, quantitative analysis of regional integration by Michael Plummer, Fan Zhai and this author (Petri, Plummer, & Zhai, 2012).

## I. Why Asia Pacific Integration Matters

Korea's trade neighborhood is huge, innovative and dynamic. A generally liberal trading environment has generated tremendous flows of goods and services in the Asia Pacific and developed production networks that now set global standards for manufacturing efficiency. These linkages will become still more important if, as expected, the region's share of world output continues to rise.

Global trade amounted to \$14 trillion in 2010, and all but \$5 trillion involved APEC countries – a useful working definition of the Asia Pacific region – as either an exporter or importer or both (Table 1). Intra-Asia Pacific trade amounted to \$5 trillion. This included trade within the Americas (\$1 trillion), within Asia and Oceania (little over \$2 trillion), and across the Pacific Ocean (little under \$2 trillion).

Table 1. Trade flows in the Asia Pacific, 2010 (\$bill.)

	Americas	Asia	Oceania	Russia	ROW	World
Americas	999	397	28	8	635	2,067
Asia	740	2,291	109	51	1,340	4,532
Oceania	14	154	14	1	55	238
Russia	14	53	0	0	332	400
ROW	894	1,198	62	177	4,720	7,050
World	2,661	4,094	214	237	7,082	14,287

Source; APEC Bilateral Database, accessed 25 February 2012.

<sup>2</sup> Our modeling work since 2010 has consistently focused on a “TPP13” scenario; since then, Canada, Japan and Mexico have joined the negotiations as projected, and the 13-member configuration is now likely to be realized if Korea joins the final stages of the negotiation (Petri et al., 2012).

These trade flows are unusually dynamic. Regional variations in resource endowments and development levels enable countries to exploit opportunities implicit in these gaps. Labor-rich and resource-poor countries exchange manufactured goods for primary materials; advanced and emerging economies exchange high-technology and labor-intensive products; and rapidly growing countries acquire new industries from more established ones. By 2030, APEC's share of world GDP is likely to rise from 53% to 56% (Table 2). Meanwhile, the share of the Americas within this total will decline from 54% to 45%.

Table 2. Projected growth in the Asia Pacific, 2010-25

	GDP USD2007bill.		2010-25 Growth	Share of World GDP	
	2010	2025		2010	2025
Americas	16,784	24,918	2.7	28.8	24.4
Asia	11,856	27,999	5.9	20.4	27.5
Oceania	1,056	1,632	2.9	1.8	1.6
Russia	1,323	2,790	5.1	2.3	2.7
ROW	27,182	44,627	3.4	46.7	43.8
World	58,201	101,967	3.8	100.0	100.0

Source: Petri et al. (2011).

Much credit for the growth of Asia Pacific trade goes to GATT/WTO rules, but those are becoming less relevant as technologies and forms of linkage change. In the absence of updated global rules, bilateral trade agreements have swept across the region. While there were only four major agreements among APEC economies before 2000 – the ASEAN Free Trade Area, the Canada-US Free Trade Area, the North American Free Trade Area, and the Australia-New Zealand Closer Economic Relations accord – today there are around 50, with others in the works.

Regional agreements were concluded first by groups on one or the other side of the Pacific, including especially ASEAN countries. But one-third of Asia Pacific trade crosses the Pacific Ocean and is especially important in providing access to final goods markets, technology and raw materials. Trans-Pacific linkages have come into sharper focus in Asia Pacific agreements since the mid-2000s. Since 2009, both the Asian and Trans-Pacific tracks have coalesced into separate, vast negotiations. Each promises significant gains and could, in principle, lead to the consolidation of the two tracks.

## II. The Asian and Trans-Pacific Negotiating Tracks

Korea is a member of the RCEP, but it could also easily join the TPP given its existing FTAs with the United States and other members. At this writing (late 2013), there is speculation that it will soon do so. The fundamental issue for Korea, however, is to avoid divergences between the tracks – and especially ruptures between China and the United States – that would force it to make sensitive political choices. Korea can minimize this threat by helping to shape both tracks in complementary ways.

Since 2007, APEC Leaders have repeatedly noted that the Asian and Trans-Pacific negotiating efforts could be possible pathways toward an integrated regional-wide FTAAP. Yet there is still uncertainty about how the tracks will progress. Some observers fear, for example, that the tracks will divide the region rather than integrate it. We now turn to these issues.

### *Asian track*

Asia's regional trading institutions have been based on the Association of Southeast Asian Nations (ASEAN) rather than Northeast Asia's giant economies. Launched in 1967 for security reasons, ASEAN turned its attention to economics in 1977 with a preferential trade agreement and joint industrial projects. Since then, ASEAN has sought deeper regional integration and established a prominent venue for regional summits. Its strategic role was strengthened by trade agreements with China initiated in 2002, leading to a full ASEAN-China FTA in 2010. These initiatives were followed by agreements with Japan and Korea, and eventually also with India, Australia and New Zealand.

Over time, interest has shifted to wider agreements that could exploit the advantages of larger economic zones. In 2004, the economic ministers of ASEAN, China, Japan and Korea (ASEAN+3) commissioned a feasibility study of an East Asia FTA (EAFTA). The study recommended a comprehensive, high standard agreement, but no action followed. A follow-up study in 2009 scaled back these ambitions, focusing on a unified ROO regime, but still failed to gain traction.

Meanwhile, ASEAN established an East Asian Summit (EAS) in 2005 by adding Australia, New Zealand and India (to create ASEAN+6). At the 2007 summit, Japan proposed a Comprehensive Economic Partnership of East Asia (CEPEA) based on this membership. A framework was presented to the 2009 summit which agreed to examine CEPEA in parallel with EAFTA. Studies

argued that CEPEA would create larger gains, and proposed an agenda based on trade and investment facilitation and liberalization. However, disagreements between China and Japan on whether integration should follow the EAFTA or CEPEA route impeded progress.

By 2009 the Trans-Pacific Partnership negotiations were also underway. The leaders of China, Japan and Korea, perhaps in response, began annual meetings in 2008 and concluded a trilateral investment treaty in 2012. China and Japan also agreed to permit both the EAFTA and CEPEA processes to move forward. Eventually ASEAN proposed the RCEP framework, a regional approach based on the ASEAN+6 membership but designed to keep an “ASEAN-centric” architecture (Petri & Plummer, 2013). Negotiations began in 2013.

ASEAN’s guidelines for RCEP (ASEAN, 2012) are reasonably ambitious, but given a large and diverse membership, most observers expect slow progress. Due to rocky political relations among Northeast Asia’s large economies, leadership has drifted to smaller and relatively diverse Southeast Asian economies. Indonesia, the region’s largest economy and thus the most likely leader for integration, is preoccupied by domestic politics and has recently backed away from liberalization. Strong leadership will be needed to achieve ambitious outcomes, say, results that reflect the template of ASEAN’s FTA with Australia and New Zealand.

Since FTAs already connect ASEAN with all other RCEP partners, a relatively easy alternative is to recast current agreements as parts of a “new” RCEP framework. But this alone will not generate significant benefits, unless it is accompanied by deeper liberalization, and/or new and politically difficult accords among China, India, Japan and Korea.

### *Trans-Pacific track*

The vision for Asia Pacific economic integration dates back to 1968, when academic economists founded the Pacific Trade and Development Forum (PAFTAD), convening a series of influential conferences that continue today. PAFTAD led to the quasi-governmental Pacific Economic Cooperation Council (PECC) in 1980, which then set the stage for the official Asia Pacific Economic Cooperation (APEC) forum in 1989. APEC made “free trade and investment in the region” its central vision in the Bogor Declaration of 1994. It tried but failed to negotiate formal agreements toward this goal (ending in the collapse of the “Early Voluntary Sectoral Liberalization” effort in 1998) and now focuses on trade and investment facilitation.

APEC has, however, encouraged “pathfinder” initiatives for formal agreements among groups of members. One such project was the Trans-Pacific Strategic Economic Partnership (later known as the P4 agreement), a high-quality trade agreement linking Brunei, Chile, New Zealand and Singapore concluded in 2005, which became the seed of the TPP negotiations. APEC has also continued to encourage work on region-wide free trade. In 2006, the APEC Business Advisory Council (ABAC) proposed a Free Trade Area of the Asia Pacific (FTAAP). The 2010 Leaders’ Declaration identified the EAFTA, CEPEA and the TPP as pathways to an FTAAP (APEC, 2010).

Against the background of these initiatives, the United States announced its interest in joining the P4 in 2008. Australia, Peru and Vietnam soon followed. After the US presidential turnover, incoming President Barack Obama confirmed US interest and made the TPP a centerpiece of his trade policy. Malaysia joined the negotiations in 2010, Canada and Mexico in 2012, and Japan in 2013, bringing the current negotiating group to 12 members. At this writing, Korea is exploring the possibilities for joining in the near future.

The TPP would represent a breakthrough in global rule-making by consolidating existing trade agreements and addressing new issues that emerged in the two decades since the Uruguay Round negotiations were concluded. It could help to minimize noodle-bowl effects by unifying rules of origin and by permitting cumulation of value added across members. However, the TPP is unlikely to create unified market access schedules, since the United States and some other members are unwilling to reopen existing bilateral agreements.

The TPP is in its endgame. After 19 rounds of intensive negotiations its text is said to be nearly complete, but contains “bracketed” sections of contradictory proposals. These still address key issues such as intellectual property, environment, state owned enterprises, and market access. Politics also poses challenges. The US Congress has to pass “fast track” authority (legislation that limits final action on an agreement to an up-or-down vote) in order to make the concluding concessions possible. While the trade agreements usually attract bipartisan support in Congress, current US political divisions make any legislation uncertain.

### *A contest of templates*

For some time, the two tracks are likely to differ significantly in membership and issue coverage. This may not affect Korea directly, since its FTAs with ASEAN, the United States, hopefully soon China, and other important partners

will remain in place. But it may affect it indirectly, through its impact on the dynamism and predictability of the regional trading environment.

The RCEP excludes the United States and other countries in the Americas, and the TPP excludes China and some other Asian economies. Some observers (including many in China) initially felt that China was intentionally left out of the TPP,<sup>3</sup> which was seen mainly as an effort by the United States to isolate China. At the time, China-US tensions were exacerbated by the global financial crisis and elections or government turnovers in both countries. By 2013 these concerns eased and some Chinese observers now see the TPP as a “WTO moment” that could help drive Chinese reforms. In practice, both governments understand that the TPP will contain provisions that China would find difficult to accept and the reconciliation of the tracks, while desirable and likely, may take time.

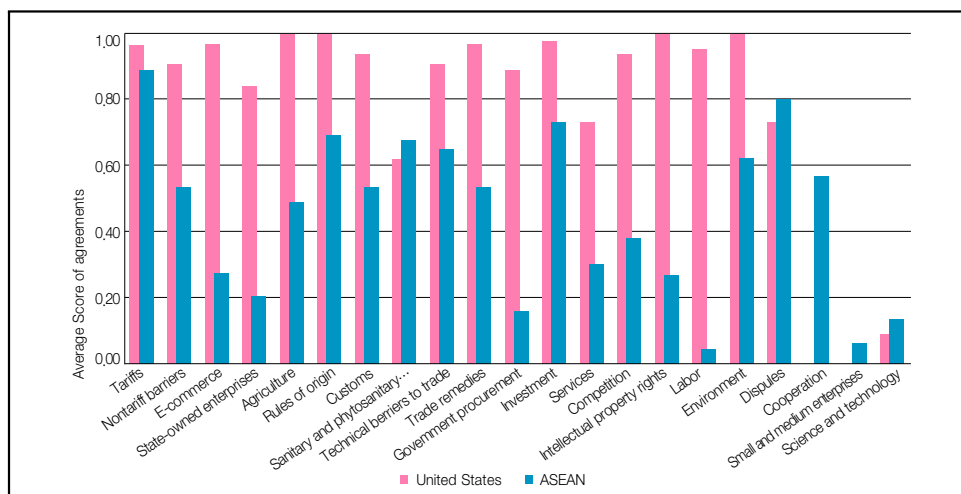
Had Korea been more fully involved in the TPP negotiations at the outset, it might have been in a better position to help defuse these tensions by representing Chinese concerns in the TPP and, in turn, helping China better understand the negotiations. While the opportunity to shape the negotiations significantly appears to be closing in the TPP even if Korea now joins, Korea can still play a very important role in RCEP and more generally in working toward a consolidation of the Asian and Trans-Pacific tracks.

The differences between the Asian and Trans-Pacific tracks can be illustrated by comparing trade agreements concluded by ASEAN and the United States in the past. Petri et al. (2012) develop a comprehensive database of Asia Pacific trade agreements and assign scores to provisions in 21 issue areas contained in them (Figure 1). They show that agreements concluded by the United States have higher scores than Asian agreements on issues such as government procurement, intellectual property rights, investment, and competition. ASEAN agreements have more limited provisions on average, but stronger provisions in a few areas such as cooperation and collaborative dispute resolution. On average, intra-Asian accords also applied smaller average cuts to higher initial tariffs, leaving larger barriers behind.

<sup>3</sup> The Chinese economic news agency Caixin was among several to report that “on the mainland, many were upset that China was not invited to the TPP talks.” <http://english.caixin.com/2011-11-25/100331554.html> (Accessed Nov. 10, 2013)



Figure 1. Average scores of provisions on major issues



Source: Petri, Plummer and Zhai (2011).

If the averages of past agreements are a guide, several major differences are likely to emerge between the two tracks. First, tariffs will be of greater concern on the Asian track, where they are usually higher, but average cuts will be limited to around 90 percent, with exemptions for numerous sensitive products. The Trans-Pacific track will seek deeper cuts in tariffs, perhaps around 95 percent with fewer exceptions. Second, Asian agreements will emphasize market access for goods and smoothly functioning production chains, while the Trans-Pacific track will also focus on issues such as service and investment barriers and intellectual property. Third, outside of core economic issues, Asian negotiations will focus mostly on development assistance, while the Trans-Pacific track will include provisions on labor, the environment and competition between state-owned and other enterprises.

These differences are likely to define the competition between Asian and Trans-Pacific templates. They reflect, in large part, structural differences between the economies that dominate each track. Asian agreements will prioritize market access in manufacturing and preserve policy space for development. Trans-Pacific agreements, in turn, will address market restrictions in services, investment and intellectual property, and regulations that limit competition. Economics argues that all barriers be removed to maximize gains from trade among emerging and advanced economies. Comprehensive liberalization packages – which more closely resemble the TPP template – are ultimately

needed to enable each group of countries to build political support for trade and to shift resources toward its most productive sectors and firms.

### III. Economic Payoffs

Each track can be expected to generate significant benefits, including for Korea. Moreover, competition between the tracks is likely to lend momentum to each track, ultimately creating incentives for consolidation. At each stage, much depends on the economic payoffs that the negotiating partners expect from new agreements. This section describes these payoffs based on the results of a novel computable general equilibrium (CGE) model.

#### *Modeling framework*

The effects of alternative agreements have been estimated in some detail, using a 24-region, 18-sector computable general equilibrium (CGE) model developed by Zhai (2008). The model includes novel features and has been equipped with new data on trade agreements in the Asia Pacific. Results are calculated over a 15-year time period and incorporate the effects of each year's solution on subsequent capital stocks, but the solutions are not forward-looking. Since this paper focuses on trade policy strategies facing Korea, only a brief overview of the modeling application can be included here; further information is provided in an Annex, and full details are reported in Petri et al. (2012a).

CGE models have been long been used to assess trade liberalization and have become increasingly sophisticated over time. Nevertheless, they have been criticized for: (i) underestimating economic changes that resulted from large and ambitious agreements, such as NAFTA (Kehoe, 2005); (ii) missing important effects such as increases in productivity and international investment; and (iii) overstating the effects of trade agreements by assuming complete regional liberalization rather than the limited progress that is typically achieved (Productivity Commission, 2010).

These concerns are addressed with various modeling innovations in the present study. First, a new type of trade model is used, incorporating productivity differences among firms within any given sector. The present model represents the first full-scale CGE application of recent advances in trade theory based on the work of Marc Melitz (2003). This specification implies changes in productivity due to liberalization – as barriers are reduced, productive firms expand and unproductive ones exit. In sectors assumed to be subject to

monopolistic competition, the range of firms is represented by a statistical distribution, and exports are determined by the share of firms that have productivity high enough to cover the fixed and variable costs associated with exporting. These costs vary by product and the destination market.

Second, trade agreements are assumed to eliminate only a part – and sometimes small part – of pre-agreement barriers. Tariff and non-tariff barriers are estimated using a variety of sources. A portion of these barriers is then assumed to be “actionable,” that is, to be accessible to policy measures normally incorporated in trade agreements. Finally, the share of actionable barriers eliminated is calculated using the score of an agreement on a particular issue. Such scores are presented in Figure 1 and are derived from a new database of the detailed provisions of existing agreements. Since the provisions of new agreements still under negotiation are not yet known, they are estimated on the basis of similar past agreements – for example, for the expected TPP agreement we use scores from recent US agreements such as the Korea-US FTA, and for the RCEP agreement we use an average of recent ASEAN agreements.

Third, existing trade agreements are included in the baseline solution of the model and so the benefits calculated represent only the incremental effects of new liberalization. The effects of agreements already implemented are reflected in base year data, and simulations are then used to include in the baseline agreements that have been concluded but are not yet fully implemented (such as the Korea-US agreement). Shocks involving additional agreements are then applied and analyzed relative to the baseline.

The timing assumptions used to model the TPP and RCEP tracks assume rapid progress to make the full results of each agreement evident in a reasonable timeframe. The analysis begins with a baseline projection from 2010 to 2025 that assumes reasonable economic growth (based on projections by CEPII and reported in Foure et al., 2010) and the implementation of existing trade agreements, but no additional trade policy changes. The TPP and RCEP agreements are assumed to be concluded in 2014 and are added to the baseline between 2015 and 2019. In some scenarios, a region-wide FTAAP is then also added over the 2020-2025 period. Details are discussed in Petri et al. (2012).

### *Results*

The results confirm the value of various integration scenarios and, from Korea's viewpoint, identify significant differences among them. In this brief overview, we examine four scenarios: a TPP12 scenario based on the TPP's

current negotiating members, a TPP13 scenario with Korea also included, an RCEP scenario based on ASEAN+6 membership, and an FTAAP scenario based on APEC membership.<sup>4</sup>

First, Asia Pacific integration promises large benefits, with region-wide liberalization generating income gains of \$1.9 trillion, or nearly 2 percent of world GDP in 2025 (Table 3). Asia Pacific agreements represent a Doha-scale project. While the region accounts for only part of world trade, the scenarios envisioned offer more liberalization than could be expected under global agreements and generate larger gains.

Table 3. Income gains under alternative scenarios

	GDP 2025	Income gains (\$bill)				% of baseline			
		TPP12	TPP13	RCEP	FTAAP	TPP12	TPP13	RCEP	FTAAP
<b>Americas</b>	<b>24,867</b>	<b>101.7</b>	<b>115.6</b>	<b>2.5</b>	<b>373.3</b>	<b>0.41</b>	<b>0.46</b>	<b>0.01</b>	<b>1.50</b>
Canada	1,978	8.7	9.9	-0.1	26.2	0.44	0.50	0.00	1.32
Chile	292	2.5	2.6	0.0	6.5	0.86	0.90	0.00	2.23
Mexico	2,004	9.9	21.0	2.8	67.7	0.50	1.05	0.14	3.38
Peru	320	3.9	4.5	0.0	6.3	1.22	1.42	-0.02	1.98
United States	20,273	76.6	77.5	-0.1	266.5	0.38	0.38	0.00	1.31
<b>Asia</b>	<b>34,901</b>	<b>125.2</b>	<b>182.8</b>	<b>627.0</b>	<b>1354.3</b>	<b>0.36</b>	<b>0.52</b>	<b>1.80</b>	<b>3.88</b>
Brunei	20	0.2	0.2	1.2	1.1	0.95	1.10	5.85	5.45
China	17,249	-34.8	-46.8	249.7	678.1	-0.20	-0.27	1.45	3.93
Hong Kong	406	-0.5	-0.8	46.8	84.9	-0.12	-0.19	11.54	20.91
India	5,233	-2.7	-3.8	91.3	-29.5	-0.05	-0.07	1.74	-0.56
Indonesia	1,549	-2.2	-3.5	17.7	38.0	-0.14	-0.23	1.14	2.45
Japan	5,338	104.6	119.4	95.8	228.1	1.96	2.24	1.79	4.27
Korea	2,117	-2.8	45.8	82.0	129.3	-0.13	2.16	3.87	6.11
Malaysia	431	24.2	26.3	14.2	38.4	5.61	6.10	3.29	8.90
Philippines	322	-0.8	-1.1	7.6	15.9	-0.24	-0.35	2.35	4.95
Singapore	415	7.9	8.1	2.4	13.6	1.90	1.95	0.58	3.28
Taiwan	840	-1.0	-2.9	-16.1	53.0	-0.12	-0.35	-1.92	6.31
Thailand	558	-2.4	-3.7	15.5	27.4	-0.44	-0.67	2.79	4.91

<sup>4</sup> The three small “other ASEAN” economies, Cambodia, Lao PDR and Myanmar, are included in this simulation of the FTAAP, while APEC member Papua New Guinea is not, since its economy is not independently modeled.

Table 3. Continued

	GDP 2025	Income gains (\$bill)				% of baseline			
		TPP12	TPP13	RCEP	FTAAP	TPP12	TPP13	RCEP	FTAAP
Vietnam	340	35.7	46.1	17.3	72.9	10.52	13.57	5.10	21.46
Other ASEAN	83	-0.4	-0.4	1.6	3.1	-0.42	-0.50	1.88	3.74
<b>Oceania</b>	<b>1,634</b>	<b>10.7</b>	<b>13.2</b>	<b>21.7</b>	<b>32.1</b>	<b>0.65</b>	<b>0.80</b>	<b>1.33</b>	<b>1.97</b>
Australia	1,433	6.6	8.6	19.8	26.4	0.46	0.60	1.38	1.84
New Zealand	201	4.1	4.5	1.9	5.8	2.02	2.25	0.92	2.86
<b>Others</b>	<b>41,820</b>	<b>-14.1</b>	<b>-16.8</b>	<b>-6.8</b>	<b>162.0</b>	<b>-0.03</b>	<b>-0.04</b>	<b>-0.02</b>	<b>0.39</b>
Europe	22,714	-3.7	-3.4	5.1	-32.6	-0.02	-0.02	0.02	-0.14
Russia	2,865	-1.4	-2.0	-5.3	265.9	-0.05	-0.07	-0.18	9.28
ROW	16,241	-9.0	-11.4	-6.6	-71.4	-0.06	-0.07	-0.04	-0.44
<b>WORLD</b>	<b>103,223</b>	<b>223.4</b>	<b>294.7</b>	<b>644.4</b>	<b>1921.7</b>	<b>0.22</b>	<b>0.29</b>	<b>0.62</b>	<b>1.86</b>

Source: author's simulations.

Note: TPP12 = current 12 negotiating members, TPP13 = also including Korea.

Second, the results confirm substantial benefits from both the TPP and RCEP. Gains under RCEP would in fact be larger, since they would remove distortions in markets that are still relatively protected. These benefits would depend to a large extent on the China-India-Japan-Korea component of RCEP, which represent especially difficult agreements on large trade flows still subject to significant barriers. (A large majority of trade flows in the TPP are covered by high quality agreements, with NAFTA applied to the massive trade among Canada, Mexico and the United States.)

Third, while nearly all economies would benefit under each scenario, the countries that would gain the most (in percentage terms) are typically those that are initially protected, small, and/or participate in both tracks. Meeting all of these criteria, Vietnam would fare especially well. Countries that participate in both the TPP and RCEP generally gain more from the TPP, since most already have FTAs with nearly all RCEP partners.

Fourth, Korea would lose \$3 billion annually under the TPP12 (in which it is not included) but gain \$46 billion annually by joining the TPP13. These gains would include a new FTA with Japan, but also significantly more indirect trade with the United States and upgrades of existing FTAs with other partners. Korea would gain \$82 billion under RCEP mainly due to access to the Chinese market. However, the RCEP scenario of this simulation is optimistic. It includes

a comprehensive agreement among China-India-Japan-Korea, which will not be easy to achieve. It also includes an FTA agreement between Korea and China, which Korea is likely to achieve even without RCEP through its direct bilateral negotiations with China. As a result, Korea's incremental benefits from RCEP could be much smaller than shown in Table 3, indeed smaller than those from the TPP.

Fifth, the gains associated with the two tracks result primarily from trade creation – deeper integration through reduced barriers – rather than trade diversion or preference erosion, that is, gains achieved at the expense of non-member countries.<sup>5</sup> For example, the losses imposed on non-members under the FTAAP are \$134 billion, compared to benefits of \$2 trillion for member economies – in effect, only 6 percent of benefits involve losses for others. While diverting some trade, these large regional agreements would mainly improve productivity, lowering export prices and improving the terms of trade of other countries.

Additional results (reported in Petri et al. (2012) and on [www.asiapacifictrade.org](http://www.asiapacifictrade.org)) are available on trade and production effects by sector, and on the impact of using different templates to conclude trade agreements. For example, we estimate that global benefits from the FTAAP would be \$2.4 trillion per year if based on the TPP template, and only \$1.3 trillion per year if based on the RCEP template. The results reported in this paper are based on a compromise template and fall in between the extremes.

## VI. Strategic Implications

The mega-regional negotiations in the Asia Pacific represent the single most important change in the region's trading system in two decades. Their final form is still unclear; they still depend on the choices of Korea and other key economies. This section examines Korea's specific and general interests in alternative scenarios of the regional system.

Korea could gain significantly from new agreements, according to our estimates, despite the agreements it already has in place. Also, given its open

<sup>5</sup> Preference erosion denotes losses result from eliminating the advantage that non-member countries had under prior FTAs (for example, Korea had as a result of its FTA with the United States). These losses differ from trade diversion from an economics perspective: Eroding existing preferences increases global welfare because it leads to more efficient production, while introducing new ones tends to reduce it.

economy, Korea also has an especially large stake in a cooperative, rules-based system. One outcome of the competitive liberalization is regional and global liberalization, but another is a world of protectionist blocs, which would put Korea in a difficult political position. Trends now point to overlapping and perhaps consolidated agreements, and do not appear to be leading toward antagonistically partitioned blocs. Nevertheless, middle powers, and especially Korea, have an interest in guiding the regional process toward an open regime.

### *Korea's choices*

The status of Korea's trade agreements is summarized in Table 4. Korea has bilateral or small-group negotiations in place or underway with a large number of TPP and RCEP partners – in fact with every member of APEC except for Hong Kong, Russia and Taiwan. An agreement is also in place with the European Union, which is not shown in the table.

Table 4. Korea's Free Trade Agreements in the Asia Pacific

	TPP	RCEP	ASEAN+1	Bilateral	FTAAP
Canada				Negotiation	Planned
<b>Chile</b>	<b>Planned</b>			<b>In force</b>	<b>Planned</b>
Mexico	Planned			Negotiation	Planned
<b>Peru</b>	<b>Planned</b>			<b>In force</b>	<b>Planned</b>
<b>United States</b>	<b>Planned</b>			<b>In force</b>	<b>Planned</b>
<b>Brunei</b>	<b>Planned</b>	<b>Negotiation</b>	<b>In force</b>		<b>Planned</b>
China		Negotiation		Negotiation	Planned
Hong Kong					Planned
<b>India</b>		<b>Negotiation</b>		<b>In force</b>	
<b>Indonesia</b>		<b>Negotiation</b>	<b>In force</b>	<b>Negotiation</b>	<b>Planned</b>
Japan	Planned	Negotiation		Dormant	Planned
<b>Malaysia</b>	<b>Planned</b>	<b>Negotiation</b>	<b>In force</b>	<b>Planned</b>	<b>Planned</b>
<b>Philippines</b>		<b>Negotiation</b>	<b>In force</b>		<b>Planned</b>
<b>Singapore</b>	<b>Planned</b>	<b>Negotiation</b>	<b>In force</b>	<b>In force</b>	<b>Planned</b>
Taiwan					Planned
<b>Thailand</b>		<b>Negotiation</b>	<b>In force</b>	<b>Planned</b>	<b>Planned</b>
<b>Vietnam</b>	<b>Planned</b>	<b>Negotiation</b>	<b>In force</b>	<b>Negotiation</b>	<b>Planned</b>
<b>Other ASEAN</b>		<b>Negotiation</b>	<b>In force</b>		
Australia	Planned	Negotiation		Signed	Planned
New Zealand	Planned	Negotiation		Negotiation	Planned
Russia					Planned

Note: countries with which Korea has an FTA are shown in bold.

Source: Asian Development Bank, <http://www.aric.adb.org/fta-country>, accessed 24 August 2013.

Table 5. Korea's exports under alternative FTA scenarios

Exports to:	Baseline exports	Change in exports (\$bill)				% of baseline			
	2025	TPP12	TPP13	RCEP	FTAAP	TPP12	TPP13	RCEP	FTAAP
<b>Americas</b>	<b>97.7</b>	<b>-3.9</b>	<b>26.5</b>	<b>-6.8</b>	<b>2.1</b>	<b>-4.0</b>	<b>27.1</b>	<b>-7.0</b>	<b>2.1</b>
Canada	5.5	-0.2	3.9	-0.4	2.7	-4.5	71.5	-6.4	49.4
Chile	3.4	-0.1	0.1	-0.2	-0.3	-4.3	4.1	-7.0	-10.1
Mexico	11.6	-0.6	23.5	-0.6	14.6	-5.3	202.3	-4.8	125.0
Peru	1.1	-0.1	1.8	-0.1	1.3	-11.2	163.5	-7.4	112.8
United States	76.0	-2.7	-3.0	-5.6	-16.1	-3.6	-3.9	-7.4	-21.2
<b>Asia</b>	<b>372.4</b>	<b>-0.5</b>	<b>57.6</b>	<b>191.2</b>	<b>230.6</b>	<b>-0.1</b>	<b>15.5</b>	<b>51.3</b>	<b>61.9</b>
Brunei	0.2	0.0	0.1	0.0	0.0	-4.4	39.3	-4.5	6.9
China	208.6	-1.8	-1.9	166.4	192.9	-0.9	-0.9	79.7	92.4
Hong Kong	10.0	0.0	-0.2	1.6	2.0	-0.1	-2.4	16.1	20.5
India	13.8	-0.1	-0.2	14.0	-2.0	-0.7	-1.7	101.1	-14.2
Indonesia	16.3	-0.1	-0.1	0.4	1.8	-0.6	-0.8	2.4	11.2
Japan	31.3	0.3	21.9	9.2	16.1	0.9	69.9	29.5	51.6
Korea	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Malaysia	12.7	-0.8	6.5	0.1	2.5	-6.5	51.1	0.5	19.7
Philippines	9.8	-0.1	0.0	-0.1	-0.5	-0.8	-0.5	-1.2	-5.6
Singapore	25.4	-0.1	-0.1	-2.4	6.4	-0.5	-0.5	-9.6	25.3
Taiwan	12.9	-0.1	-0.2	0.1	0.7	-0.9	-1.9	1.1	5.5
Thailand	8.3	-0.1	0.6	-0.8	-0.9	-0.6	6.8	-9.4	-10.8
Vietnam	21.6	2.5	31.6	2.8	11.4	11.5	146.0	13.0	52.9
Other ASEAN	1.4	0.0	-0.1	0.0	0.1	-3.3	-4.8	-1.7	5.1
<b>Oceania</b>	<b>7.6</b>	<b>-0.7</b>	<b>7.4</b>	<b>4.1</b>	<b>5.6</b>	<b>-9.3</b>	<b>97.6</b>	<b>54.1</b>	<b>74.2</b>
Australia	6.3	-0.5	6.6	3.6	5.0	-8.6	104.0	56.3	78.7
New Zealand	1.3	-0.2	0.8	0.5	0.6	-12.9	65.5	42.8	51.5
<b>Others</b>	<b>240.5</b>	<b>-1.9</b>	<b>-2.7</b>	<b>-14.9</b>	<b>6.9</b>	<b>-0.8</b>	<b>-1.1</b>	<b>-6.2</b>	<b>2.9</b>
Europe	118.0	-0.8	-1.1	-6.8	-13.3	-0.7	-1.0	-5.8	-11.2
Russia	29.8	-0.3	-0.3	-1.8	33.6	-0.9	-1.0	-6.1	112.9
ROW	92.7	-0.9	-1.3	-6.3	-13.5	-0.9	-1.4	-6.8	-14.5
<b>WORLD</b>	<b>718.2</b>	<b>-7.0</b>	<b>88.7</b>	<b>173.6</b>	<b>245.2</b>	<b>-1.0</b>	<b>12.4</b>	<b>24.2</b>	<b>34.1</b>

Source: author's simulations.

Note: TPP12 = current 12 negotiating members, TPP13 = also including Korea.



To highlight the nature of gains in the TPP and RCEP agreements, Table 5 summarizes how each would affect Korea's *bilateral exports*. (Income gains for various countries were presented in Table 3). This indicates which partner economies are likely to generate Korean gains, recognizing of course that export gains only partly explain the contributions of any given partnership. Since these projections report general equilibrium results, rather than the impact effects of reductions in barriers, they also incorporate the effects of adjustments in exchange rates and income levels in each economy.

Table 5 shows that Korea's export gains under the TPP would be generated in part by the new FTA with Japan. But the table also shows significant exports to Vietnam, Mexico and Malaysia. These flows reflect in part indirect exports to the United States through improved opportunities for regional production chains. They would take advantage of the expected cumulative rules of origin in the TPP, which would make products produced using Korean inputs eligible for preferential access to all TPP markets, including the United States. Korean textile exports to the Vietnamese garment industry provide an important example of such gains. In fact, Korea's direct exports to the United States would decline somewhat, since the TPP would erode preferences that Korea now enjoys under the KORUS agreement. In addition, the TPP would also upgrade Korea's existing FTAs with ASEAN countries that participate in the agreement.

Table 5 also shows that the gains from RCEP would be mostly driven by improved access to Chinese markets, with some additional benefits due to improved access to Japanese markets. Exports to the United States would again decline slightly, in this case because Korea's new export opportunities would result in real appreciation. Note, however, that most benefits obtained under RCEP could be also realized if Korea independently negotiated an FTA with China and with Japan in the TPP, which are widely expected to happen before the RCEP negotiations are concluded.

The largest and widest gains would come under a region-wide FTAAP. This would generate the effects noted in the TPP and RCEP scenarios – better markets access in China, India and Japan. In addition, the FTAAP would yield new access to Russia, which is also a member of APEC. Wider agreements would also mean additional benefits for trade flows already covered by prior FTAs, since they will increase demand for inputs from Korea into production chains that operate in Mexico, Vietnam and other ASEAN countries. Larger zones typically also have higher preference utilization rates, since it is easier to meet their rules of origin and the costs of compliance can be spread over more trade.

So what does this imply for Korean FTA strategy? It suggests, first, that Korea still needs to fill in crucial gaps in its FTA lineup, specifically with China, Japan and Oceania. Some of this can be done through bilateral negotiations, such as the just-concluded agreement with Australia and the prospective agreement with China. An agreement with Japan could be negotiated in four different ways, through RCEP, a trilateral China-Japan-Korea FTA, the TPP, and direct bilateral negotiations. Korea is engaged in the first two negotiations, but these appear to be making little headway. The TPP offers a better opportunity for this agreement since Korea could expect both high quality rules and support from other countries on issues on which it disagrees with Japan. Arguably, the political relationship with Japan would be also easier to manage in the TPP than in other venues.

A second Korean goal might be to strengthen regional production systems by transforming the current hub-and-spoke network of free trade areas to FTAs that cover groups of economies and apply cumulated rules of origin to production systems within them. As already noted, this goal would be well served by the TPP, which would provide opportunities for indirect exports through production chains that also include lower wage regional producers. RCEP would also provide such opportunities, but it lacks the scale of final goods markets in the TPP.

The third, and arguably most important, Korean objective is systemic – a regional architecture that protects the interests of middle-power economies. What kind of system would be best suited to Korean interests? A system with few, flexible rules that give countries space for national strategies, or one with explicit, enforceable rules that ensure openness? In the last two decades, Korea's interests have shifted from the former toward the latter. As a sophisticated, mid-sized economy, Korea needs supply chains that connect seamlessly. (With significant barriers, supply chains locate entirely within larger economic zones like China or NAFTA.) This requires (i) rules of origin that encompass many countries to allow unimpeded flows of inputs, (ii) efficient and harmonized trade procedures, and (iii) investment provisions that permit production facilities to locate freely. In addition, Korea has sectoral interests in advanced electronics, environmental products, entertainment services, engineering and design. All these also require solid intellectual property protection and wide access to relatively wealthy markets.

Korea's systemic objectives will require that relations among the region's largest economies – including China, Japan, Korea and the United States – be

governed by open, compatible rules. Although the Korean economy is large absolutely, it is much smaller than those of its larger partners and this argues for insurance that only a rules-based system can provide. Both the TPP and RCEP could in principle promote rules-based governance, but the TPP is likely to have more comprehensive and rigorous rules, especially for Korea's leading sectors and trade with advanced economies.

### *Regional scenarios*

Korea's systemic interests are closely tied up with the architecture of the Asia Pacific trading system, which it can only marginally control. The outlook is optimistic, but adverse outcomes are still possible. So far, the TPP and RCEP have been stimulating mutual progress and their competition appears constructive. But four possible outcomes to the regional "game" can be still envisioned:

- *Fragmentation*: the tracks devolve into antagonistically competitive blocs, with incompatible rules and fragmented membership;
- *Pathway*: one agreement dominates the regional architecture over time and absorbs most of the region's economies;
- *Equilibrium*: the RCEP and TPP and a new agreement between China and the United States ensure parallel, but not consistent, coverage of the region's important trade connections;
- *Consolidation*: the several regional trade agreements develop in parallel but eventually undergo one of several possible forms of consolidation.

Among these, the *fragmentation* scenario is the least favorable and the least likely. The Asian and Trans-Pacific tracks already have many common members, and entry by Korea and other economies would increase the overlap. Tariffs are already reasonably low, and therefore preferences are not likely to cause significant diversion effects. Nor is either group likely to increase barriers, as some worst-case scenarios would anticipate. Finally, the contemporary regional trading system depends so heavily on intricate production chains that a rupture in these relationships is difficult to imagine, short of political catastrophe.

The *pathway* scenario envisions either the Asian or the Trans-Pacific track becoming – as APEC leaders proposed – the pathway to a region-wide FTAAP. The TPP negotiations may be heading this way. They have a substantial lead, have attracted a large and growing membership, and several others are now

expressing interest in joining. China has officially noted its interest (Spegele & Catan, 2013) and well-placed Chinese experts have called for China to join the TPP (Editorial, 2013). Yet the standards of the TPP, negotiated under US leadership, may slow quick accession by China and other Asian economies. China also has the economic clout to impose its own imprint on future regional agreements and may not join the TPP unless it can significantly change some provisions.

Another possibility is an *equilibrium* trajectory that begins with RCEP and TPP agreements but does not lead to either emerging as dominant. Rather, economies would join agreements as they are ready. A free trade agreement might also emerge between China and the United States, enabling the region's largest countries to offer each other the preferences that they grant to others. The TPP, RCEP and China-US FTA agreements would cover most of the region's trade and would deliver – based on preliminary calculations not yet reported in this paper – much of the benefits of a truly regional agreement. This would dampen the incentive to seek more difficult, region-wide solutions such as the FTAAP – although of course they would also make it easier to reach such outcomes. Thus, one possibility is that regional trading relationships will be covered by new rules, but these would still differ, at least for a while, among groups of economies.

The *consolidation* trajectory is one that we mapped out in earlier work (Petri, et al. 2012). This trajectory envisions the TPP and RCEP developing in three phases. In the early phase, the benefits on each track would consist largely of preferential access to US and Chinese markets, attracting smaller countries. In this stage China and the United States would benefit only modestly; their participation would be motivated by future gains. In the middle, more ambitious phase, the TPP would absorb larger economies like Japan and Korea. The TPP – assuming it is successfully concluded – appears to have already reached this phase. In the final phase, China and the United States would be left among the few economies *without* preferential access to each other's large markets. Consolidating the tracks – say through the FTAAP – would offer China and the United States roughly four times the benefits than the separate Asian and trans-Pacific tracks. Since we proposed this trajectory, Canada, Mexico and Japan have joined the TPP and Korea is considering membership. In addition, China is considering a more active role in regional negotiations, including directly with the United States.

From the viewpoint of economics, there is no contest among these outcomes.

Consolidation would be simplest for business and would yield extra benefits. For example, region-wide rules of origin – a feature that only consolidated agreements can provide – and broad tariff reductions would mean that regional supply chains could be constructed based on efficiency considerations alone, without regard to trade barriers. As the results suggest, the better the agreement – the higher its quality in terms of liberalizing tariffs and non-tariff barriers – the greater the benefits that can be expected from it. In earlier work (Petri et al., 2012), we estimated that an FTAAP agreement based on the expected template of the TPP would yield nearly twice the benefits of one based on that of RCEP. Even Asian economies, which are designing RCEP to favor their industries of comparative advantage, would benefit more from a TPP-based agreement than an RCEP-based one. This is because the scale of overall benefits generated by the agreement – the size of the pie – would outweigh the effects of alternative distributions of benefits in favor of different industries.

### *China and the United States*

The road to a regional agreement ultimately passes through Beijing and Washington, since these two capitals represent the region's largest economies. Much will depend on their ability to cooperate on economic and security interests. From the viewpoint of economics, China and the United States have much to gain from integration; our estimates suggest that the FTAAP would yield nearly three times the gains for China as RCEP, and nearly four times the gains for the United States as the TPP.

Even if the two tracks evolve in parallel at first, they will generate incentives for China and the United States to seek consolidation. This could occur through an FTAAP, or parallel TPP, RCEP and China-United States agreements. An alternative approach might be for China and the United States to work out a free trade agreement, or a schedule of agreements that lead to such an outcome, independently of other regional processes.

An FTAAP itself could take varied, innovative forms. The FTAAP might be an unconventional regional agreement – a regional WTO+ – that sets minimum rules for relations among members (say similar to RCEP) but also permits more rigorous rules, such as those in the TPP, for relationships among TPP economies. This framework would be similar to, but more extensive than, the WTO framework. It might envision countries assuming greater obligations and receiving greater preferences by moving to the more rigorous template. These details would require much further analysis and discussion.

From Korea's perspective, some form of regional agreement would provide institutional stability for the country's large bets on regional relationships. Even in terms of direct gains, Korea would fare better under an FTAAP than parallel TPP and RCEP agreements (by about 12 percent). But it would benefit especially from a system of rules that protect, and are guaranteed by, all of the region's major economies.

What can Korea do to promote convergence? Middle powers that participate in multiple tracks have a limited, but important role to play in containing the divergence of tracks. If Korea participates in both the TPP and Asian tracks, it would be by far the most important economy to play such a mediating role. Three specific objectives for such mediation include:

- *Information-sharing.* Korea could help to communicate the nuances of the TPP and Asian negotiations to countries not involved in both, including especially China and the United States, to defuse misunderstandings. Such "insider's views" are useful even if, as is likely, the direct exchanges between, say, China and the United States intensify.
- *Identifying impediments to convergence.* Korea could help to identify core issues that could divide the tracks. It will be familiar with constraints and sensitivities based on its extensive negotiating experiences – for example, on issues such as government procurement, state-owned enterprises, and intellectual property.
- *Promoting convergence.* Korea could guide the negotiations toward consolidation by putting its negotiating weight behind provisions that are broadly acceptable. This would mean, for example, urging wider issue coverage and stronger provisions in RCEP, and more development-friendly solutions in the TPP.

Such bridging efforts will be especially influential if they are jointly championed by several middle-power countries. Korea would be a natural leader for such a group, which might include open, middle-sized economies such as Australia, Brunei, Canada, Chile, Malaysia, New Zealand, Singapore and others. The influence of such a group will not prevail in all difficult cases, but the larger economies of the TPP and RCEP will understand that convergence is in their interest. At a minimum, bridging activities will promote information sharing and better understanding.

Political scientists often warn that great powers trading places in economic rankings have not always managed the transition peacefully. In today's era of

globalization and technological progress, the contrast between cooperation and conflict is immense and better understood than ever. Korea can make a significant contribution to drive home this point. Also, the economics profession should leave no doubt that its expertise argues for open, competitive, rules-based solutions to regional economic relations.

## V. Conclusions

Major new negotiations are changing the landscape of Asia Pacific economic integration; the Asian and Trans-Pacific tracks are accelerating under the competitive pressure. Korea has attractive policy options in this setting. Its past initiatives have built a near-complete hub-and-spoke network of agreements with major trading partners, and its future policies can focus on realizing further direct benefits while also shaping an open regional system.

The TPP and RCEP both offer substantial benefits to Korea and the world. Global benefits would be larger initially under RCEP, since the economies participating in it still have relatively high trade and investment barriers. However, the TPP template is more comprehensive and offers greater benefits to countries that adopt it. We estimate Korea's benefits to range from 2 to 6 percent of GDP, depending on the extent of regional integration achieved.

Korea has several important interests to pursue in regional free trade, despite its already extensive network of FTAs. First, it would benefit from filling in remaining gaps in its FTA lineup, notably with China and Japan. Second, it would benefit from membership in the TPP and RCEP, even if they overlap existing FTAs, since they are likely to introduce the cumulation of rules of origin across all members. Third, since Korea is smaller than some of its major partners, it would benefit from an effective, rules-based regional trade regime. Thus, Korea has a direct interest in the development of the TPP and RCEP tracks and their eventual consolidation. These priorities can in turn be advanced through early Korean membership in both tracks and Korean leadership in promoting their convergence.

The outlook for Asia Pacific trade is brighter today than it has been for some time, despite challenges in the wake of the global financial crisis. The trade agreements examined in this study could become the next driver of growth. Yet the success of the negotiations cannot be taken for granted and the politics will be difficult in every country. An effective Korean middle-power role could provide an important boost to both tracks.

## Annex: The CGE Model

The model has 24 regions and 18 sectors and is solved recursively from 2010 to 2025. The model is described in Zhai (2008), and additional details on data specification for the present application are in Petri et al. (2012).

### *Production and trade*

Agriculture, mining and government services are assumed to be perfectly competitive, and are modeled using a representative firm that operates under constant returns-to-scale technology. Trade in these sectors is modeled using the Armington assumption for import demand.

Manufacturing and private services are assumed to be monopolistically competitive, and are modeled with a production and trade specification based on Melitz (2003). Each sector has a continuum of firms differentiated by productivity and the variety they produce. Firms face fixed production costs, resulting in increasing returns to scale, and also fixed and variable costs in exporting activities. On the demand side, agents have Dixit-Stiglitz preferences over a continuum of varieties. Each firm is a monopolist for the variety it produces and sets its price at a constant markup over marginal cost. A firm enters domestic and export markets if the profits generated from such sales cover fixed costs. These cutoff conditions define the productivity thresholds for firms and in turn determine their average productivities. Since exports involve fixed and variable costs in addition to domestic operations, only high-productivity firms export. 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 and value added is split into a capital-land bundle and aggregate labor. At the bottom level, the capital-land bundle is further decomposed into capital and land (for the agriculture sector) or natural resources (for the mining sector), and aggregate labor into unskilled and skilled labor. Unit costs at each level are calculated as the duals to the CES aggregator functions.



*Income distribution, demand and factor markets*

Incomes generated from production accrue to a single representative household in each region. The household is assumed to maximize utility using an Extended Linear Expenditure System (ELES), derived from the Stone-Geary utility function. Savings are determined by the demand system as the demand for a standard “good” with a price equal to that of the consumption bundle. The composition of investment and government consumption are specified as Leontief functions. Composite demand in each sector is allocated to domestic and imported varieties using Dixit-Stiglitz functions.

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. Natural resource factors in forestry, fishing and mining are fixed, sector-specific factors that reflect resource constraints.

*Macro closure*

Three macro closures complete the model: the net government balance, the trade balance, and the investment/savings balance. Government consumption and saving are set exogenously in real terms, so changes in government expenditure result in changes in income tax rates on households. Foreign savings are set exogenously in real terms, using the price index of OECD manufacturing exports as numéraire. Equilibrium on foreign accounts is achieved by changing relative prices (e.g. real exchange rates) across regions. Domestic investment is the endogenous sum of household savings, government savings and foreign savings.

### References

- APEC. 2010. *The Yokohama Vision-Bogor and Beyond*. Singapore: APEC.
- ASEAN. 2012. *Guiding Principles and Objectives for Negotiating the Regional Comprehensive Economic Partnership*.
- Bark, T. 2012. The KORUS FTA: a New Building-block in the Asia-Pacific Region. Washington, D.C.
- Editorial. 2013. How China Can Raise Its Economic Gain. *CaixinOnline*(November 20).
- Foure, J., Benassy-Quere, A. & Fontagne, L. 2010. *The world economy in 2050: a tentative picture*. CEPII Working Paper 2010-27, Paris: CEPII.
- Kehoe, T. J. 2005. An Evaluation of the Performance of Applied General Equilibrium Models on the Impact of NAFTA. In T. J. Kehoe, T. N. Srinivasan, & J. Whalley eds., *Frontiers in Applied General Equilibrium Modeling: In Honor of Herbert Scarf*. Cambridge: Cambridge Univ., pp. 341-377.
- Melitz, M. J. 2003. "The Impact of Trade on Intra-Industry Relocations and Aggregate Industry Productivity." *Econometrica*, vol. 71, no. 6, pp. 1695-1725.
- Petri, P. A. 2012. Competing templates in Asia-Pacific economic integration. In G. Rozman ed., *Asia at a Tipping Point: Korea, the Rise of China, and the Impact of Leadership*. Washington, DC: Korea Economic Institute.
- Petri, P. A. & Plummer, M. G. 2013. ASEAN centrality and the ASEAN-US economic relationship. Honolulu: East-West Center.
- Petri, P. A., Plummer, M. G. & Zhai, F. 2011. The Trans-Pacific Partnership and Asia-Pacific Integration: A Quantitative Assessment, East-West Center Working Papers no 119, Honolulu: East-West Center. <http://scholarspace.manoa.hawaii.edu/handle/10125/22298>(Accessed Oct. 2013).
- Petri, P. A., Plummer, M. G. & Zhai, F. 2012. *The Trans-Pacific Partnership and Asia-Pacific integration: a quantitative assessment*. Washington, DC: Peterson Institute for International Economics.
- Productivity Commission. 2010. *Bilateral and Regional Trade Agreements*. Canberra: Australian Government Productivity Commission.
- Spegele, B. & Catan, T. 2013. China Suggests Shift on US-led Trade Pact. *Wall Street Journal*(May 31).
- Zhai, F. 2008. "Armington meets Melitz: Introducing firm heterogeneity in a global CGE model of trade," *Journal of Economic Integration*, vol. 23, no. 3, pp. 575-604.
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