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Assessment of the APEC Leaders' Growth Strategy

APEC Policy Support Unit
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1. HIGHLIGHTS: KEY FINDINGS

A. ECONOMIC GROWTH IN APEC HAS BEEN COLLECTIVELY STRONGER THAN IN THE REST OF THE WORLD

- Between 2005 and 2013, the APEC region grew at an annual average rate of 2.6 percent, outperforming the rest of the world, which grew up at 2.0 percent per year.

- Wealth has increased in per capita terms. The APEC's real GDP per capita increased at an annual average rate of 1.9 percent per year, above the rate of 0.5 percent experienced by the rest of the world. APEC-developing economies reported a collective increase in their real GDP per capita by 5.5 percent per year. For APEC-industrialized economies, the expansion of the real GDP per capita was equivalent to 0.5 percent per year.

- In 2013, APEC's GDP per capita was equal to USD 11,413, measured in constant 2005 USD, up from USD 9,825 in 2005. However, the difference between APEC-industrialized and developing economies was still large (USD 42,633 vs USD 4,541).

B. PRODUCTIVITY AND GROSS CAPITAL FORMATION HAS INCREASED IN APEC, ESPECIALLY IN DEVELOPING ECONOMIES

- While the labor force in APEC increased at an annual average rate of 0.9 percent per year, the output per worker increased by 1.7 percent per year between 2005 and 2013. The highest increase was in APEC-developing economies, which reported an increase of the labor force by 1.0 percent per year, but an upsurge in their output per worker by 5.2 percent.

- APEC increased its gross capital formation by 2.9 percent per year. However, APEC-developing economies are collectively getting closer to the gross capital formation levels by APEC-industrialized economies. While the gross capital formation levels in APEC-industrialized economies in 2013 were lower than those in 2005; APEC-developing economies raised their gross capital formation by 8.5 percent per year.

C. THE GLOBAL FINANCIAL CRISIS ACCENTUATED STRUCTURAL CHANGES. THE IMPORTANCE OF TRADE IN APEC'S GROSS DOMESTIC PRODUCT WEAKENED RIGHT AFTER THE CRISIS, PARTICULARLY IN APEC-DEVELOPING ECONOMIES

- While trade is still a critical component in APEC's economic growth, it seems to be to some extent less important after the Global Financial Crisis. APEC exports and imports in 2008 represented 25.7 percent and 26.6 percent of APEC's GDP, respectively. In 2013, they accounted for 25.2 percent and 26.0 percent of APEC's GDP.

- However, for APEC-developing economies, the participation of trade in their GDP declined markedly in recent years. Their exports as a share of GDP went down from a

"peak" of 51.5 percent in 2008 to 44.9 percent in 2013. At the same time, imports as a percentage of GDP also fell from 45.9 percent to 41.8 percent.

- Quarterly changes in trade and GDP in APEC show that trade growth rates were much larger than GDP growth rates before the Global Financial Crisis. Since 2012, GDP quarterly growth rates are higher than those for trade. Domestic sources of growth have become more relevant in recent years. In addition, it is possible that the consolidation of and/or the slower pace of expansion of some global supply and value chains that started in the early 2000s, and accentuated during the Global Financial Crisis, are explaining the occurrence of lower trade growth rates nowadays.

D. THERE IS A REBALANCING OF GROWTH WITHIN APEC AFTER THE GLOBAL FINANCIAL CRISIS

- In 2005, APEC economies posted a current account deficit of 1.1 percent of the GDP, equivalent to USD 293 billion; whilst in 2014, APEC reported a current account surplus of 0.01 percent, equivalent to USD 2 billion. After the global financial crisis, APEC-developing economies have been reducing their current account surpluses and APEC-industrialized economies have been reducing their current account deficits.

- Expansionary fiscal policies were implemented by several economies in 2009 to recover from the effects of the global financial crisis, with deficits ranging from 13.5 percent to 0.6 percent. By 2014, the fiscal position in 19 out of 21 APEC economies improved in comparison to 2009, and the largest fiscal deficit recorded was equivalent to 7.7 percent.

- APEC-developing economies have a better fiscal position in comparison to industrialized economies (fiscal deficit in developing economies is -1.2 percent of the GDP vs -5.4 percent of the GDP in industrialized economies). However, since 2011, the former's fiscal position worsened, while the latter's fiscal position improved.

- APEC-industrialized economies are the main recipients of FDI, but their share in APEC has been declining. Their FDI inward stocks totaled USD 3.6 trillion in 2005 and represented 65 percent of the APEC's FDI inward stocks. In 2014, they were equivalent to USD 6.4 trillion in 2014, representing 54.3 percent of the APEC's FDI inward stocks.

E. GROWTH HAS BEEN MORE INCLUSIVE IN APEC, BUT MORE IS NEEDED TO GIVE EQUAL OPPORTUNITIES TO PEOPLE

- More than 300 million people came out of poverty in the APEC region between 2005 and 2011, mainly due to rapid growth in developing economies.

- However, access to education and skills development is still unequal in APEC. By 2012, APEC-developing economies reported 6.7 tertiary education graduates per 1,000 people, compared to 9.4 tertiary education graduates per 1,000 people in APEC-industrialized economies.

- APEC-developing economies still lag behind their industrialized counterparts in terms of entrepreneurship opportunities. For example, it takes on average almost seven

procedures to start a business in APEC-developing economies. In APEC-industrialized economies, the average number of procedures is close to four.

- More efforts are needed to provide social safety nets to vulnerable populations. Eight APEC-developing economies did not provide any unemployment protection as of 2013, and almost 40 percent of healthcare spending are out-of-pocket (compared with less than 15 percent in APEC-industrialized economies).

- As measured by the Gini index, inequality has decreased in eight APEC economies and increased in four economies between 2004 and 2012. Declining inequality, coupled with increasing average incomes, points to inclusive growth as this implies that poor households are benefiting from economic growth proportionally more than rich ones.

F. EFFORTS TO GROW IN A MORE SUSTAINABLE/GREEN MANNER ARE INCREASING, BUT THEY STILL SEEM INSUFFICIENT

- Energy supply and consumption in APEC grew at 2.5 percent and 2.2 percent per year between 2005 and 2012. While the primary energy supply coming from renewable sources (hydro, solar, wind, geothermal, among others) made up 6.4 percent of total energy supply in 2012 (up from 5.9 percent) in 2005, non-renewable sources still dominate the provision of energy. Coal made up 38.4 percent of the primary energy sources, 29.3 percent was from oil, and 21.2 percent was from gas in 2012.

- Renewable energy capacity has improved in the APEC region, especially in developing economies. The percentage of the R&D government budget on renewable energy is four times higher in industrialized economies. Nevertheless, while the share of hydroelectric plants in generating electricity went up from 14.3 percent to 15.1 percent in the APEC region during 2005-2012, and the share of other renewable sources went up from 1.4 percent to 3.5 percent.

- However, thermoelectric power plants also increased their importance in energy generation from 68.3 percent to 70.5 percent during 2005-2012. While APEC-industrialized economies have reduced their reliance to coal, due to their increasing utilization of natural gas to generate electricity; APEC-developing economies increased their utilization of coal.

- Energy efficiency improved across the whole APEC region from 2005 to 2012, as they are requiring less energy to produce one unit of GDP. Industrialized economies made the largest progress.

- Carbon dioxide (CO2) emissions went up by 2.4 percent per year between 2005 and 2012. APEC-developing economies increased their CO2 emissions by 5 percent, representing 61.4 percent of the total emissions in APEC. However, for APEC-industrialized economies, the CO2 emissions per capita was equivalent to 4.2 tonne-carbon per person, almost three times higher than the levels in APEC-developing economies (1.5 tonne-carbon per person).

- Technology improvements are increasing water productivity in APEC. In 2007, APEC could generate USD 15.7 of its GDP using one cubic meter of water. In 2013, the amount of GDP produced by one cubic meter of water was equivalent to USD 17.8.

This is very relevant as the total renewable internal freshwater resources remained steady in APEC between 2007 and 2012, but the amount of renewable internal freshwater per capita declined slightly (-0.7 percent).

G. ACCESS TO TECHNOLOGY HAS IMPROVED, BUT INNOVATION IS STILL HETEROGENEOUS IN THE APEC REGION

- R&D expenditure grew at an annual average rate of 3.7 percent during 2005-2012, reaching USD 766.5 billion in 2012. However, R&D expenditure is concentrated in few APEC economies. The top three APEC largest economies accounted for more than 80 percent of the total R&D expenditure in 2012.

- Efforts to improve access to tertiary education are noticeable in APEC-developing economies. Student enrolment levels to tertiary education institutions rose by 4.4 percent per year in those economies between 2005 and 2012. These economies tend to have greater percentages of students graduating in science and engineering in comparison to APEC-industrialized economies. However, the quality of education still need to improve in some developing economies, as in a number of cases the pupil-teacher ratio could be more than twice as much as those from industrialized economies.

- However, the number of researchers per million people in APEC only grew marginally from 1,562 in 2005 to 1,694 in 2011. APEC-industrialized economies and APEC-developing economies with high GDP per capita presented a substantially higher density of researchers.

- Access to ICT infrastructure has increased significantly across APEC. The levels of broadband internet subscriptions went up from 5 to 15 per 100 inhabitants and the number of internet users rose from 22 to 51 per 100 inhabitants between 2005 and 2013. Mobile phone subscriptions grew up from 42 to 102 per 100 inhabitants, meaning that many people in APEC have more than one mobile phone subscription.

- Protection intellectual property rights in APEC-industrialized economies are perceived as stronger than those in APEC-developing economies. Despite efforts to increase the number of patent applications in APEC-developing economies, the percentage of patents granted in APEC-developing economies is still low. APEC-developing economies only explained about 1/3 of the total patents granted in 2013.

H. MIXED RESULTS IN SECURE GROWTH. FOOD SECURITY AND NUTRITION HAS IMPROVED, BUT DEVELOPING ECONOMIES STILL NEED TO CATCH UP IN OTHER AREAS

- Food security and nutrition have been improving in APEC economies. The number of undernourished people in the region fell by more than 100 million between 2005 and 2014 mainly due to food security gains in developing economies. This has narrowed the gap with industrialized economies in terms of food supply adequacy.

- APEC-developing economies need to further develop their resilience to adverse shocks, particularly in terms of improving the capacity of vital infrastructure. Developing economies have less than 1/5 of the road network (per 1,000 people) of industrialized

economies and their air freight traffic (per 1,000 people) is about 1/4 of that of industrialized economies.

- Security and resilience depend on having an effective government to lead and coordinate efforts. Based on the World Governance Index, APEC-developing economies score lower than their industrialized counterparts in terms of political stability, government effectiveness and control of corruption.

I. ESTABLISHING DETAILED ACTION PLANS AND DISCUSSING ON THE FEASIBILITY OF SETTING CLEAR GROWTH TARGETS COULD BE PART OF THE POST-2015 APEC GROWTH STRATEGY WORK

- As opposed to the G-20, the assessment of the progress of the APEC Growth Strategy was affected by the lack of detailed and specific action plans to guide its implementation, as well as by the absence of quantitative targets.

- Action plans could list detailed and specific actions in each of the priority areas. One way could be for either APEC as a whole or individual APEC economies to establish policy commitments with a clear timeline under each growth attributes. The advantage of action plans is that it provides accountability to the initiative and a clear guide on what to do to attain the objectives of the APEC Growth Strategy. Any next steps decided by APEC post-2015 should include clear directions and simple mechanisms for APEC economies and/or sub-fora to provide information in order to facilitate the monitoring and evaluation of the initiative.

- These specific actions should not be taken in a very prescriptive manner as the only avenues to attain each of the five growth attributes and improve the quality of growth. Specific actions are helpful by providing guidance to governments in the implementation of the APEC Growth Strategy. However, these actions cannot be attributed as the sole factors to improve the quality of growth, which is a very complex area and it involves a combination of multiple factors, including exogenous ones.

- In addition, APEC economies may wish to discuss the convenience of establishing a general quantitative aspirational growth target and/or specific ones under each of the growth attributes. The inclusion of aspirational growth targets provides additional incentives to authorities and government officials to implement policies to get them closer to those targets.

2. INTRODUCTION: CONTEXT OF THE ASSESSMENT

2.1 BACKGROUND

Growth has been part of the discussions within APEC since its early years. The importance of coordinated efforts to achieve sustainable growth rates and close the development gap in the Asia-Pacific region was recognized in 1990, when the Joint Statement of the APEC Ministerial Meeting acknowledged that *"consultation among policy makers in the region was valuable in their common efforts to sustain growth, promote adjustment, and reduce economic disparities"*[1].

Within APEC, from the start, trade has been recognized as one of the most important pillars for economic growth. The 1993 Leaders' Declaration already recognized that one of the foundations for economic growth was an open multilateral trading system[2]. This vision was extended in 1994, when APEC recognized the need to "*reinforce economic cooperation in the Asia-Pacific region on the basis on equal partnership, shared responsibility, mutual respect, common interest, and common benefit, with the objective of APEC leading the way in: 1) strengthening the open multilateral trading system; 2) enhancing trade and investment liberalization in the Asia-Pacific; and 3) intensifying Asia-Pacific development cooperation"*[3].

The 1994 Leaders' Declaration acknowledged that to attain the objective of sustainable growth in APEC, other efforts needed to complement the work to strengthen the multilateral trading system. On the one hand, the declaration agreed to adopt the long-term goal of free and open trade and investment in the Asia-Pacific which is colloquially known as the Bogor Goals, in a way that is consistent to WTO/GATT[4]. By that, APEC economies can liberalize trade and investment in three ways: 1) unilaterally; 2) by negotiating RTA/FTAs compatible with WTO; and 3) at the multilateral level[5]. On the other hand, the declaration also recognized the relevance of trade and investment facilitation to complement the liberalization efforts and assist in the expansion of the flow of trade and investments[6].

Furthermore, the 1994 Leaders' Declaration stressed the need to intensify development cooperation in order to *"develop more effectively the human and natural resources of the Asia-Pacific region so as to attain sustainable growth and equitable development of APEC economies, while reducing economic disparities among then, and improving the economic and social well-being of our people"*[7]. In this context, the declaration recognized the necessity to implement programs in several areas, such as human resources development, science and technology, SMEs and economic infrastructure (e.g. energy, transportation and telecommunications, among others).
Broadly speaking, the 1994 Leaders' Declaration noted that APEC work to achieve the objectives of sustainable growth and equitable development should rest on three pillars: 1) trade

[1] APEC (1990), Joint Statement – 1990 APEC Ministerial Meeting, http://www.apec.org/Meeting-Papers/Ministerial-Statements/Annual/1990/1990_amm.aspx
[2] APEC (1993), Seattle Declaration – APEC Leaders' Economic Vision Statement, http://www.apec.org/Meeting-Papers/Leaders-Declarations/1993/1993_aelm.aspx. See third paragraph.
[3] APEC (1994), Bogor Declaration – APEC Economic Leaders' Declaration of Common Resolve, http://www.apec.org/Meeting-Papers/Leaders-Declarations/1994/1994_aelm.aspx. See paragraph 4.
[4] Ibid. See paragraph 6.
[5] APEC Policy Support Unit (2010). "Progressing towards the APEC Bogor Goals: Perspectives of the APEC Policy Support Unit", p. 6-7.
[6] APEC (1994), Op. Cit. See paragraph 7.
[7] APEC (1994), Op. Cit. See paragraph 8.

and investment liberalization; 2) business facilitation; and 3) economic and technical cooperation. In this sense, it acknowledged that trade was a necessary, but not a sufficient factor to generate growth and make it sustainable in time. Policies in other fields, like those mentioned in the previous paragraph, are also very relevant to achieve those objectives.

Since then, APEC initiatives have been inspired by at least one of those three pillars and the APEC Growth Strategy is not an exception. To give an idea where the APEC Growth Strategy lies within APEC, figure 2.1 shows a taxonomy of APEC's ultimate objectives, goals/initiatives and pillars. According to the 1994 Leaders' Declaration, APEC's ultimate objectives are to achieve sustainable development, equitable development and strengthening the sense of the Asia-Pacific community. To achieve those objectives, APEC works on the implementation of initiatives, many of them with particular goals in mind, which rely on activities and actions associated with the three APEC pillars[8]. These initiatives are not necessarily independent or exclusive one another, since several of them share some links. For example, many aspects of trade facilitation are included in the Bogor Goals, Trade Facilitation Action Plans I and II, Supply Chain Connectivity Framework Action Plan, Ease of Doing Business and the Growth Strategy.

Figure 2.1: Taxonomy of APEC's Ultimate Objectives, Initiatives and Pillars

Source: APEC Secretariat, Policy Support Unit

2.2 WHAT IS THE APEC GROWTH STRATEGY?

The origins of the APEC Growth Strategy dates back to 2009, when Senior Officials started to discuss possible ways to address economic recovery after the Global Financial Crisis hit the markets in late 2008. They noted that there was a perception that growth drivers had not been necessarily balanced within and across economies; and that the benefits of economic growth

[8] Some initiatives have a clear quantitative goal or target. For example, the APEC's Ease of Doing Business initiative has an aspirational target of improving doing business by making it 25 percent easier, cheaper and faster in five priority areas during the period 2009-15. Other initiatives do not have numerical goals or targets. For example, the Bogor Goals refers to an open and free trade and investment system by 2020, to be achieved in a WTO-consistent manner. This is related to a substantial reduction of barriers and not a full elimination of barriers. The APEC Growth Strategy belongs to the group of initiatives with no quantitative goals. It only refers to the need to improve the quality of growth, by including specific desired attributes for economic growth. For more information, see section 2.2 of this chapter.

had not spread across the whole society. Moreover, there was a sense that issues such as climate change or lack of innovation could restrain economies to grow in the future.

It is under this scenario that restoring economic growth and maintain it in the long-term was going to require a new strategy. The 2009 Leaders' Declaration acknowledged *"(…) the necessity to develop a new growth paradigm for the changed post-crisis landscape, and an expanded trade and investment agenda that will strengthen regional economic integration (REI) in the Asia-Pacific region. We cannot go back to "growth as usual" (…)"*[9]. In this sense, APEC took into account the discussions in the G-20 summit in Pittsburgh, in September 2009, and proposed a new growth paradigm by supporting balanced growth, fostering inclusive growth and promoting sustainable (green) growth. The instruction by APEC Leaders was to develop for next year "a comprehensive long-term growth strategy", containing those growth characteristics mentioned earlier.

Following those instructions, APEC officials intensified their discussions on the matter. In November 2010, APEC Leaders endorsed the Growth Strategy, which recognized that trade and investment liberalization and facilitation were going to continue as the principal drivers of growth in APEC, but acknowledged that the conditions in the region had changed and brought new challenges and opportunities[10]. In this respect, the Growth Strategy mentions that *"(…) APEC members cannot continue with 'growth as usual' and 'the quality of growth' needs to be improved, so that it will be more balanced, inclusive, sustainable, innovative and secure (…)"*[11].

As seen, the goal of the Growth Strategy is only qualitative and seeks to achieve growth by having specific attributes that will facilitate APEC to "*ensure that regional growth and economic integration are sustainable and widely shared among all populations*"[12]. This approach differs from the one adopted by the G-20 Growth Strategy. G-20 economies agreed a quantitative collective target, which is *"to lift the G-20's GDP by at least an additional two per cent by 2018"*[13]. The intention is to increase the collective G-20 GDP by more than two percent above the trajectory implied by current policies by 2018[14].

The rationale of the APEC Growth Strategy is that the attributes of balanced, inclusive, green, innovative and secure growth will be helpful for APEC to achieve its ultimate objectives of sustainable growth, equitable development and the strengthening of the Asia-Pacific community through economic integration.

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[9] APEC (2009), "2009 Leaders' Declaration: Singapore Declaration – Sustaining Growth, Connecting the Region", http://www.apec.org/Meeting-Papers/Leaders-Declarations/2009/2009_aelm.aspx

[10] APEC (2010), "The APEC Leaders' Growth Strategy", http://www.apec.org/Meeting-Papers/Leaders-Declarations/2010/2010_aelm/growth-strategy.aspx. See section 1.

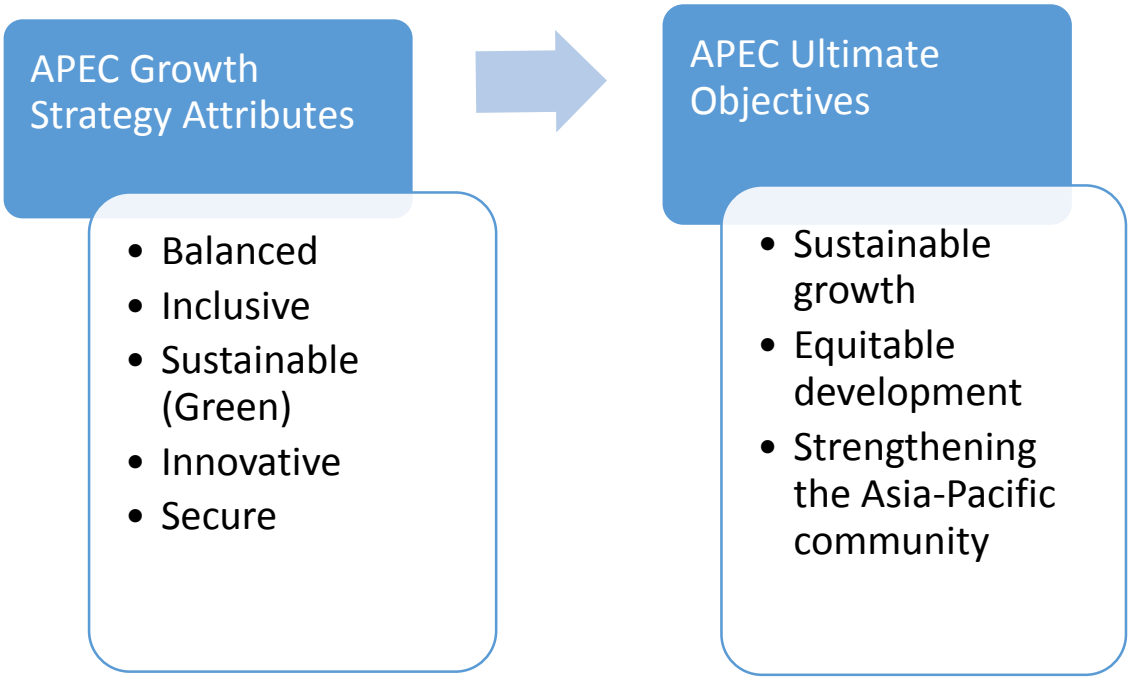
[11] Ibid. See section 1.

[12] Ibid. See section 1.

[13] G-20 (2014), "G20 Leaders' Communiqué", Brisbane Summit, 15-16 November, http://www.g20australia.org/sites/default/files/g20_resources/library/brisbane_g20_leaders_summit_communique.pdf

[14] G-20 (2014a), "Communiqué, Meeting of Finance Ministers and Central Bank Governors", Sydney, 22-23 February, https://g20.org/wp-content/uploads/2014/12/Communique%20Meeting%20of%20G20%20Finance%20Ministers%20and%20Central%20Bank%20Governors%20Sydney%2022-23%20February%202014_0.pdf

Figure 2.2: Relationship between APEC Ultimate Objectives and Growth Strategy Attributes



Source: APEC Secretariat, Policy Support Unit

The APEC Growth Strategy provides a general definition for each of the growth attributes and lists specific actions to be implemented. Those actions aim to promote each of five growth attributes. The definitions and actions are listed in Table 2.1.

Table 2.1: APEC Growth Strategy Attributes: Definitions and Actions

Growth Attribute and Definition	List of Actions
Balanced Growth: To seek growth across and within economies through macroeconomic policies and structural reforms that will gradually unwind imbalances and raise potential output.	- Encourage balanced growth across economies - Encourage balanced growth within economies - Facilitate growth through infrastructure investment
Inclusive Growth: To ensure that all citizens have the opportunity to participate in, contribute to, and benefit from global economic growth.	- Promote job creation, human resource development, and active labor market policies - Promote SMEs, MEs and entrepreneurship development - Promote more inclusive access to finance and financial services - Enhance social resilience and social welfare through means such as improving social safety nets and supporting vulnerable groups - Create new economic opportunities for women, elderly and vulnerable groups - Promote tourism

Sustainable (Green) Growth: To seek growth compatible with global efforts for protection of the environment and transition to green economies.	- Enhance energy security and promote energy-efficiency and low-carbon policies - Develop a low-carbon energy sector - Improve access for environmental goods and services (EGS) and develop EGS sectors - Promote green jobs education and training - Promote private investment in green industries and production processes - Promote conservation and more sustainable management of agriculture and natural resources
Innovative Growth: To create an economic environment that promotes innovation and emerging economic sectors.	- Realize smart socioeconomic activity through ICT applications - Promote digital prosperity - Develop a skilled, adaptable and professional APEC workforce - Enhance dialogues and information sharing on innovation policy - Promote innovation and creativity through effective, comprehensive and balanced intellectual property systems - Promote cooperation on standards - Promote innovation in Life Sciences
Secure Growth: To seek to protect the region's citizens' economic and physical well-being and to provide the secure environment necessary for economic activity.	- Protecting the region's economic systems from attack, disruption, and misuse is an important component of a safer business environment - Prepare for emergencies and natural disasters - Enhance infectious diseases preparedness and control of non-communicable diseases, and strengthen health systems - Strengthen food security and food safety - Combat corruption and promote transparency

Source: APEC (2010), "The APEC Leaders' Growth Strategy", http://www.apec.org/Meeting-Papers/Leaders-Declarations/2010/2010_aelm/growth-strategy.aspx. See section 2.

2.3 CHALLENGES TO ASSESS THE PROGRESS OF THE APEC GROWTH STRATEGY

2.3.1 Lack of Specific Action Plans to Guide the Implementation of the Growth Strategy

Table 2.1 shows that the actions listed by the APEC Growth Strategy are very general and comprehensive for each of the growth attributes[15]. One of the difficulties to assess the progress achieved by APEC is that the Growth Strategy do not provide information on how these actions will be undertaken. In addition, when this initiative was endorsed, it did not contemplate APEC

[15] The APEC Growth Strategy also seeks to link the growth attributes to work elements from other APEC initiatives. Those links are presented as "action plans" for the APEC Growth Strategy (See APEC (2010), section 3), but they do not meet the purpose of an action plan, as they only mention other APEC initiatives or generic areas of work associated to each of the growth attributes. In this sense, Structural Reform is linked to balanced growth; work from the APEC Human Resources Development Working Group on human resource and entrepreneurship development is linked to inclusive growth; green growth activities are associated to sustainable growth; knowledge-based economy initiatives are related to innovative growth; and human security initiatives are related to secure growth.

economies to report an action plan on the specific policies they intend to carry out as part of the efforts to implement the Growth Strategy. The absence of specific action plans by economy, makes it difficult to determine whether APEC economies have been putting into effect the necessary activities to implement the Growth Strategy.

Instead, the APEC Secretariat has been preparing annual reviews on the implementation of the Growth Strategy, which provides a compilation of activities reported by APEC committees and sub-fora for each of the five growth strategy attributes. They could help to identify which APEC groups are more active conducting activities related to the topics described in each of the Growth Strategy attributes.

2.3.2 Attribution Issues: Limitations to Determine the Impact of APEC Groups' Activities on Growth

Many of these activities reported by APEC committees and sub-fora are related to the elaboration of studies, the implementation of workshops and other capacity-building initiatives, the development of databases, and the preparation of work plans, among others. However, these activities do not necessarily allow to determine the full extent of work that APEC economies are doing to effectively implement the actions listed under each Growth Strategy attribute. Furthermore, it is very difficult to determine the impact of those activities in economic growth, and more specifically, in any of the Growth Strategy attribute. For example, the Telecommunications Working Group reported holding a workshop on broadband network development for green growth in 2013. How much did that activity contribute to sustainable/green growth in APEC? How much did the workshop help to promote private investment in green industries? It is not possible to give an answer regarding the effect of the workshop on green growth and on the promotion of private investment in green industries.

2.3.3 Absence of a Quantitative Target

As opposed to APEC, the G-20 Growth Strategy was designed in a way that it is easier to determine if this group is achieving their goal, as G-20 has a numerical GDP growth rate target. Also, the G-20 members have to submit policy commitments to encourage growth, specifying the implementation path and expected date of implementation, as well as the indicators used to measure progress. These commitments are classified in five areas: 1) macroeconomic policy responses; 2) investment and infrastructure; 3) employment; 4) competition; and 5) trade. This makes it easier to evaluate if G-20 economies are effectively carrying out those policies proposed in the five aforementioned areas in order to achieve their ultimate objective of "strong, sustainable, and balance growth, and to create jobs"[16].

2.3.4 How to Assess the APEC Growth Strategy?

The aforementioned issues are unequivocally some of the main challenges to assess the implementation of the APEC Growth Strategy. Nevertheless, it is possible to associate the actions listed under each of the Growth Strategy attributes to external indicators collected by respectable international organizations. This approach is used in Chapter 3 to analyze the progress achieved by APEC in each of the five APEC Growth Strategy attributes. The evolution of those external indicators could provide an idea on how close or how far APEC is from those listed actions that promote each of the growth attributes. For example, indicators on women's

[16] G-20 (2014), Op.Cit. See paragraphs 2 and 3.

employment levels could be a proxy to evaluate the creation of new economic opportunities for women, which is one of the actions listed as part of inclusive growth.

In addition, the information given by APEC Committees and Sub-Fora could be used to identify in which areas APEC is conducting activities to build capacity in governments, so they will be able to implement those listed actions to promote the five Growth Strategy attributes.

2.4 EXAMPLES OF LINKAGES BETWEEN THE APEC GROWTH STRATEGY AND OTHER SELECTED APEC INITIATIVES

As mentioned in Section 2.1, the APEC Growth Strategy and other APEC initiatives share the spirit of contributing in diverse ways to the realization of APEC's ultimate objectives of sustainable development, equitable growth and strengthening the Asia-Pacific community.

Several APEC initiatives were already identified as important inputs in the formulation of the Growth Strategy. In fact, the APEC Growth Strategy statement identifies many APEC initiatives in an implicit or explicit way. Moreover, some APEC initiatives endorsed after 2010, are also incorporating elements directly related to the Growth Strategy.

Since the list of initiatives with linkages to the APEC Growth Strategy is very extensive, this section attempts to show the linkages between selected APEC initiatives and the Growth Strategy.

2.4.1 Selected Trade and Investment Liberalization and Business Facilitation Initiatives

Table 2.2 provides a quick snapshot on how selected APEC initiatives related to the pillars of trade and investment liberalization and business facilitation are linked to the APEC Growth Strategy. The table shows that many of these initiatives include elements related to more than one of the growth strategy attribute.

Many initiatives have linkages to balanced growth as they usually include references to open, transparent markets and competitive environments. Similarly, linkages to innovative growth are also very common as several initiatives refer to the use of digital applications, the promotion of innovation and alignment with international standards, to improve business conditions.

Likewise, topics concerning secure growth are commonly mentioned in APEC initiatives, especially regarding to the need of having proper data, standards and customs systems to make trade safer.

Table 2.2: Linkages between the APEC Growth Strategy Attributes and Selected Trade and Investment Liberalization and Business Facilitation Initiatives

Initiative	Growth Strategy Attribute				
	Balanced	Inclusive	Sustainable/ Green	Innovative	Secure
Bogor Goals	■		■	■	■
APEC List of Environmental Goods			■		
Trade Facilitation Action Plans I and II	■			■	■

Supply-Chain Connectivity Framework Action Plan	■			■	■
Investment Facilitation Action Plan	■				
Strategic Blueprint for Promoting Global Value Chains Development and Cooperation	■	■		■	
APEC Connectivity Blueprint	■	■		■	■
Ease of Doing Business	■	■		■	
Cross-Border Privacy Enforcement Arrangement				■	■

Source: APEC Secretariat, Policy Support Unit

A more detailed description of the key linkages between these APEC initiatives and the Growth Strategy attributes is as follows:

a) Bogor Goals

As explained earlier, the APEC Growth Strategy recognizes that trade and investment liberalization and facilitation will continue to be a principal driver for creating growth in the Asia-Pacific. In other words, the Growth Strategy is taking into consideration the 1994 Bogor Goals of an open and free trade and investment system in the Asia-Pacific, which has been a cornerstone of several APEC initiatives on trade and investment matters.

The Bogor Goals are associated to the concepts of balanced growth, which refers to open markets; green growth, as it includes the need to improve market access to environmental goods and services; innovative growth, since it refers to important trade facilitation matters in goods and services such as the alignment of domestic standards to international standards, and the mobility of skilled professionals in the APEC region, among others; and secure growth, as many of their Growth Strategy actions are related to standards and customs procedures.

b) APEC List of Environmental Goods

In 2012, APEC economies agreed to reduce tariffs to 5 percent or less to a list of 54 environmental goods, with the intention to help the APEC community to have access to goods that contribute to responsible environmental practices at a lower cost[17]. This initiative is linked to one of the actions included under green growth, which is to improve the access of environmental goods and services (EGS) and develop EGS sectors. The initiative is a contribution to reduce trade barriers to goods, whose use could promote green growth and sustainable development.

c) Trade Facilitation Action Plans I and II (TFAP I and II)

These plans aimed to reduce trade transaction costs in 5 percent during the periods 2002-06 and 2007-10, respectively. These plans identified the areas of customs procedures, standards and conformance, business mobility and e-commerce as those were efforts needed to be

[17] Kuriyama, Carlos (2012), "The APEC List of Environmental Goods", Policy Brief No. 5, APEC Policy Support Unit, p. 1.

undertaken to reduce trade transaction costs[18]. In that regard, these plans could be linked to the APEC Growth Strategy through several of its attributes. First, reforms in the aforementioned areas are closely related to the efforts to encourage balanced growth within economies through better regulated markets. Second, innovative growth is associated to promote digital prosperity by adopting accepted standards and international practices and enhance the use of ICT applications, which are related to the TFAP I and II areas of standards and conformance and e-commerce. Third, some actions listed under secure growth are associated to the TFAP I and II areas of customs procedures and standards and conformance, as they are related to improving supply-chain security and strengthening food security and safety.

d) Supply-Chain Connectivity Framework Action Plan (SCFAP)

Whilst TFAP I and II focused on behind-the-border aspects of trade facilitation; the SCFAP, endorsed in 2010, focuses on not just behind-the-border issues, but also on at-the-border and across-the border issues to improve the flow of goods and services throughout the APEC region[19]. This initiative has close links with the component of balanced growth as it looks to reduce or eliminate chokepoints regarding inefficient or inadequate transport infrastructure, cross-border physical linkages, as well as underdeveloped multi-modal transport capabilities. In addition, the SCFAP also looks at eliminating chokepoints that are related to the lack of transparency of regulatory issues affecting logistics.

The SCFAP is also dealing with innovative growth, since it seeks to implement systems to make more efficient the clearance of goods at-the-border. It also aims to develop more common cross-border standards and regulations for the movement of goods and services. Secure growth is another component of the Growth Strategy within the SCFAP, as it deals with the development of safe customs procedures and multimodal transport capabilities.

e) Investment Facilitation Action Plan (IFAP)

IFAP was endorsed in 2008 and provides a series of principles that aim to facilitate the arrival of investments to strengthen economic conditions and regional economic integration in the APEC region[20]. IFAP is closely linked to the balanced growth component. One of the IFAP principles is related to the transparency in the formulation and administration of investment-related policies, which is closely associated to the concept of structural reforms aiming for transparent markets. Moreover, IFAP also seeks to improve the efficacy and effectiveness of investment procedures and build stakeholder relationships, which includes the promotion and strengthening of public private partnerships to develop infrastructure.

f) Strategic Blueprint for Promoting Global Value Chains Development and Cooperation

Globalization has created new market opportunities and has deepened the economic linkages among firms across the borders. Currently, global value chains (GVCs) are a critical component in any economy. Governments are looking to find ways to promote the participation of companies in GVCs and increased their share of value-added in goods and services. In 2014,

[18] APEC Secretariat (2007), "APEC's Second Trade Facilitation Action Plan", http://www.apec.org/Groups/~/media/Files/Groups/CTI/07_2ndTFAP_fnl.ashx

[19] APEC (2009), "CTI Annual Report to Ministers", Committee on Trade and Investment, Appendix 8, http://publications.apec.org/file-download.php?filename=App8_09_cti_rpt_SC%20Framework.pdf&id=945_toc

[20] APEC Secretariat (2009), "APEC Investment Facilitation Action Plan", http://www.apec.org/~/media/Files/Press/Features/2009/09_cti_ieg_IFAP.pdf

APEC economies agreed to develop a series of actions in a strategic blueprint to promote the development of global value chains (GVCs) in the region. This initiative is closely associated to the APEC Growth Strategy, as it includes elements related to many of its growth attributes.

In fact, this initiative is related to innovative growth, as it seeks to promote technical cooperation through capacity-building activities to build up knowledge in human resources and help economies to move up of the GVCs. Moreover, the initiative includes characteristics related to inclusive growth, as one of the components is to assist SMEs to benefit from GVCs.

The attribute of balanced growth is also part of it, as it seeks to improve the investment climate for the development of GVCs by implementing strategies to deal with investment applications in a fast and fair manner. It also aims to facilitate investments through a transparent system[21].

g) APEC Connectivity Blueprint

This initiative seeks to connect the APEC region in three broad areas, namely: 1) physical connectivity, which seeks to improve supply chain performance by connecting and integrating infrastructure in the region; 2) institutional connectivity, which aims to advance regulatory and procedural cooperation and coherence among economies; and 3) people-to-people connectivity, to enhance interaction and mobility of people[22].

The 2013 Leaders' Declaration linked implicitly this initiative to the APEC Growth Strategy, as it referred to *"(…) a blueprint that will accelerate and encourage balanced, secure and inclusive growth (…)*"[23]. In this context, balanced growth is addressed in the area of institutional connectivity, as it addresses the need to advance APEC's agenda in structural reform, which is an important element within the balanced growth component in the Growth Strategy. Secure growth is also included, since the institutional connectivity component includes actions to expand the application of a safe and trusted ICT and e-commerce environment. Inclusive growth is closely associated to the people-to-people connectivity pillar, since the latter looks to advance work on cross-border education, and expand the facilitation of movement to several groups including women and youth, which could create new opportunities for them[24].

Furthermore, the APEC Blueprint Connectivity includes the Growth Strategy's attribute regarding innovative growth, as many elements in the Blueprint Connectivity are related to improving ICT infrastructure; modernizing trade-related agencies through innovative systems, such as the use of single windows; and the use of safe digital applications[25].

h) Ease of Doing Business (EoDB)

The objective of this initiative and aims to improve the business environment in the APEC region through regulatory reforms. Inspired from the World Bank's Doing Business program,

[21] APEC (2014), "The 22nd APEC Ecomomic Leaders' Declaration - Beijing Agenda for an Integrated, Innovative and Interconnected Asia-Pacific", Annex B, http://www.apec.org/Meeting-Papers/Leaders-Declarations/2014/2014_aelm/2014_aelm_annexb.aspx

[22] APEC Policy Support Unit (2014), "APEC Connectivity Blueprint", p. 12, http://publications.apec.org/publication-detail.php?pub_id=1603

[23] Ibid.

[24] Ibid. p. 13

[25] Ibid.

this initiative seeks to make it easier, faster and cheaper to do business in the APEC region by 25 percent between 2009 and 2015, in five priority areas, as follows: 1) starting a business; 2) dealing with construction permits; 3) getting credit; 4) trading across borders; and 5) enforcing contracts[26].

The EoDB initiative is related to the attributes of balanced, inclusive and innovative growth. In terms of balanced growth, regulatory reforms to facilitate doing business is a subset of the broader concept of structural reforms. About inclusive growth, the reforms that EoDB promotes in getting credit, could facilitate access to credit and other financial services to broader groups in the society, including SMEs. Similarly, less cumbersome procedures to start a business could encourage more entrepreneurship and create new economic opportunities to people. Regarding innovative growth, it includes actions to improve ICT systems, digital applications, among others. These systems are very useful to customs, logistics and transportation sectors, which are the main actors in the priority area of trading across borders.

i) Cross-Border Privacy Enforcement Arrangement (CPEA)

The CPEA is an initiative aiming to promote and enforce information privacy protections. The intention is to increase consumer confidence in electronic commerce involving cross-border data flows by establishing a framework for regional cooperation in the enforcement of privacy laws[27]. This initiative is closely linked with the Growth Strategy attributes of innovative and secure growth, as it involves the use of intellectual property and IT systems, as well as prevention of misusing data in order to contribute to a safer business environment.

The CPEA is a pathfinder initiative, since economies are allowed to join when they consider opportune. Currently, institutions from 9 APEC economies are part of this initiative[28].

2.4.2 Selected Economic and Technical Cooperation Initiatives

Table 2.3 provides a quick snapshot on how selected APEC initiatives related to the pillar of economic and technical cooperation (ECOTECH) are linked to the APEC Growth Strategy. This table shows an illustrative and non-exhaustive list of initiatives, which keep a connection with any of the Growth Strategy' attributes. Some initiatives launched after the APEC Growth Strategy seem to have been inspired by the latter, as they include actions/activities concerning the five growth attributes. That is the case of the Accord on Innovative Development, Economic Reform and Growth, and the SME Working Group Strategic Plan 2013-2016.

Other initiatives are very focused on a particular issue and they are only associated to just one of the growth attributes. For example, the APEC Scholarship and Internship Initiative's mission is linked to inclusive growth; while the APEC Low Carbon Model Town and the APEC Network of Anti-Corruption Authorities and Law Enforcement Agencies (ACT-NET) are related to the attributes of sustainable/green growth and secure growth, respectively.

[26] Kuriyama, Carlos and Azul Ogazon (2011), "APEC's Ease of Doing Business – Interim Assessment", APEC Policy Support Unit, p. 1-2, http://publications.apec.org/publication-detail.php?pub_id=1217

[27] See http://www.apec.org/Groups/Committee-on-Trade-and-Investment/Electronic-Commerce-Steering-Group/Cross-border-Privacy-Enforcement-Arrangement.aspx

[28] Ibid.

Table 2.3: Linkages between the APEC Growth Strategy Attributes and Selected ECOTECH Initiatives

Initiative	Growth Strategy Attribute				
	Balanced	Inclusive	Sustainable/ Green	Innovative	Secure
APEC New Strategy for Structural Reform	■	■		■	
Accord on Innovative Development, Economic Reform and Growth	■	■	■	■	■
APEC Scholarship and Internship Initiative		■			
Energy Security Initiative	■		■		■
APEC Low Carbon Model Town			■		
APEC Network of Anti-Corruption Authorities and Law Enforcement Agencies (ACT-NET)					■
Action Plan on Food Security		■			■
SME Working Group's Strategic Plan 2013-2016	■	■	■	■	■

Source: APEC Secretariat, Policy Support Unit

A more detailed description of the key linkages between these initiatives related to ECOTECH pillar and the Growth Strategy attributes is as follows:

a) APEC New Strategy for Structural Reform (ANSSR)

In order to attain high quality growth and become more resilient from the economic and social perspective, APEC Leaders endorsed the ANSSR in 2010. This initiative encourages APEC economies to implement structural reforms in priority areas, and also provides the chance for APEC economies to participate in capacity-building programs and other technical cooperation activities to train government officials in the implementation of those reforms.

This initiative is closely linked with the APEC Growth Strategy component of balanced growth, as the ANSSR priority areas of open, well-functioning, transparent, better-regulated and competitive markets; better functioning of financial markets; and strengthening social safety nets are listed as part of the activities to encourage balanced growth within economies.

Similarly, another ANSSR priority area corresponding to sustained SME development and enhanced opportunities for women and vulnerable groups is associated to the activities within inclusive growth. Finally, ANSSR also covers the development of labor market opportunities, training and education, which are related to both inclusive and innovative growth[29].

[29] APEC Secretariat (2011), "APEC New Strategy for Structural Reform: Economy Priorities and Progress Assessment Measures", p. 1, https://www.google.com/url?q=http://publications.apec.org/file-download.php%3Ffilename%3D2011_ANSSR_report_webcopy.pdf%26id%3D1206&sa=U&ei=UpYvVc_WCMSesAW534CYCw&ved=0CA4QFjAF&client=internal-uds-cse&usg=AFQjCNFPrbAU44kk9jpVuHcgg3sL0bLpXA

b) Accord on Innovative Development, Economic Reform and Growth

This accord, endorsed in 2014, aims to promote closer cooperation in five areas: 1) economic reform; 2) new economy; 3) innovative growth; 4) inclusive support; and 5) urbanization[30]. The 2014 Annual Review on Implementation of the APEC Growth Strategy mentions that "*this accord includes policy actions in each of the five Growth Strategy attributes and thus provide strong support to the implementation of the Strategy*"[31].

Regarding balanced growth, the accord refers to the importance to deepen structural reforms and agreed to convene a Ministerial Meeting on Structural Reform in 2015, with the intention of setting the future direction of the work on this area. About inclusive growth, the accord seeks to strengthen cooperation on entrepreneurship and employment. It highlights the importance of promoting quality employment and developing human resources[32].

Concerning sustainable/green growth, the accord mentions the importance to improve energy efficiency and promote clean and renewable energy. It also highlights some goals, such as doubling the share of renewables in the APEC energy mix, including in power generation, from 2010 levels by 2030; and the reduction of energy intensity by 45 percent from 2005 levels by 2035[33].

Innovative growth is explicitly mentioned as one of the pillars of the accord and it refers to the promotion of cooperation in science and innovation; promote intellectual property and ensure intellectual property rights enforcement; welcome efforts to support e-commerce; among others[34].

Elements associated to secure growth also appear in this accord. For example, the commitment to promote secure financial services, as well as the need to strengthen cooperation in secure trade[35].

c) APEC Scholarship and Internship Initiative

This initiative, launched in 2014, is giving students and professionals the opportunities to improve their knowledge and skills by studying in institutions located in the APEC region. According to the APEC Education Portal, participating APEC economies have partnered with universities and companies to create new study and work opportunities, particularly for women and people from developing economies[36].

This initiative is closely related to the Growth Strategy attribute of inclusive growth, as it related to the actions on promoting human resource development, as well as creating new opportunities for women and other groups.

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[30] APEC (2014), op.cit. Annex C, http://www.apec.org/Meeting-Papers/Leaders-Declarations/2014/2014_aelm/2014_aelm_annexc.aspx

[31] APEC (2014b), "Annual Review on Implementation of the APEC Growth Strategy", Concluding Senior Officials' Meeting, 5-6 November, http://mddb.apec.org/Documents/2014/SOM/CSOM/14_csom_006.pdf

[32] APEC (2014), Op.cit. Annex C

[33] Ibid

[34] Ibid

[35] Ibid

[36] See http://education.apec.org/

d) Energy Security Initiative

This initiative was endorsed by APEC Leaders in 2001 in response to oil price volatility and the need to strengthen regional energy security. According to the Energy Working Group, this initiative consists on measures including the improvement of the transparency of the global oil market; maritime security; the implementation of a real-time emergency information sharing system; and facilitating investment, trade and technology cooperation in energy infrastructure, natural gas (including LNG), energy efficiency, clean fossil energy (including highly efficient coal-fired power generation, carbon capture and geological sequestration), renewable energy and hydrogen and fuel cells[37].

This initiative is related to the concepts of green growth as it encourages the development of clean energy sources, energy efficiency and renewable energy. The concepts of secure growth and balanced growth are also included as it includes elements of maritime security and transparency, respectively.

e) APEC Low Carbon Model Town

After the 9th Energy Ministerial Meeting in 2010, which focused on the theme of "low carbon paths to energy security", APEC started the implementation of the APEC Low Carbon Model Town initiative, which is closely related to the APEC Growth Strategy attribute of green growth.

This initiative consists on the provision of basic principles that can assist the central and local government officials in planning effective low-carbon policies and in formulating an appropriate combination of low-carbon measures while taking socio-economic conditions and city specific characteristics into consideration[38]. This initiative includes conducting feasibility studies; reviewing planned city/town development projects; and developing the concept of low-carbon towns in the APEC region and indicators associated to them.

f) APEC Network of Anti-Corruption Authorities and Law Enforcement Agencies (ACT-NET)

The ACT-NET was endorsed in 2014 and its goal is to establish a mechanism to enhance informal cross-border cooperation among anti-corruption and law enforcement agencies in charge of investigations and prosecution of crimes such as corruption, bribery, money laundering, and illicit trade[39].

This initiative, which is one of the efforts to support secure growth, also seeks to identify and return the proceeds of those crimes. The exchange of information among authorities and share of experiences of past prosecution cases are among the areas discussed for future cooperation[40].

g) Action Plan on Food Security

[37] See http://www.ewg.apec.org/energy_security.html
[38] Asia Pacific Energy Research Centre (2014), "The Concept of APEC Low-Carbon Town in the APEC Region". APEC Energy Working Group, Third Edition, January, p. vii.
[39] See http://www.apec.org/Groups/SOM-Steering-Committee-on-Economic-and-Technical-Cooperation/Working-Groups/Anti-Corruption-and-Transparency.aspx
[40] Ibid.

In 2010, the APEC Action Plan on Food Security was endorsed. The Niigata Declaration on Food Security mentioned that *"APEC economies would collectively pursue the shared goals of (i) sustainable development of the agricultural sector, and (ii) facilitation of investment, trade and markets"*[41]. The activities listed in the Action Plan aim to assist APEC to achieve these two goals. These activities include the expansion of food supply capacity; the enhancement of disaster preparedness in agriculture; the development of rural communities; the promotion of investment in agriculture; the facilitation of trade of agricultural products; and the improvement of food safety practices; among others.

As seen, this initiative is closely related to the Growth Strategy attribute of secure growth, as the main feature is to secure food. In addition, features such as the development of rural communities and the facilitation of trade of agricultural products are related to the concept of inclusive growth.

h) SME Working Group's Strategic Plan 2013-2016[42]

The SME Working Group (SMEWG) endorsed this plan in 2012, which establishes three priority areas to facilitate SMEs' growth prospects and assist them in getting more integrated into the global economy. The first priority area is about building management capability, entrepreneurship and innovation, which is closely linked to the concepts of inclusive, innovative, sustainable and secure growth, as it seeks to encourage business start-ups; foster innovative SMEs; give access to green-related information; and ensure business continuity in cases of natural disasters, among others.

The second priority area is related to financing SMEs, in particular with regards to increasing awareness and availability of wide-ranging sources of financing and strengthening SME's access to these sources. SME financing is one of the critical actions listed in the Growth Strategy under the inclusive growth attribute.

The third priority area concerns the business environment, market access and internationalization through the establishment of open and transparent business environments for SMEs and the enhancements of the SMEs' capacities to internationalize and identify business opportunities overseas. These actions are coherent with the actions to encourage balanced growth within economies.

[41] APEC (2010), "Niigata Declaration on APEC Food Security", http://www.apec.org/Meeting-Papers/Ministerial-Statements/Food-Security/2010_food.aspx. See paragraph 7.

[42] The details of this strategic plan can be found in the following link: http://mddb.apec.org/documents/2012/SMEWG/SMEWG2/12_smewg35_035.pdf

3. APEC GROWTH STRATEGY ATTRIBUTES: AN OVERVIEW OF EXTERNAL INDICATORS

3.1 A GENERAL PICTURE

3.1.1 Evolution of GDP and GDP per Capita in APEC: Bigger "Pie" and Bigger "Slice"

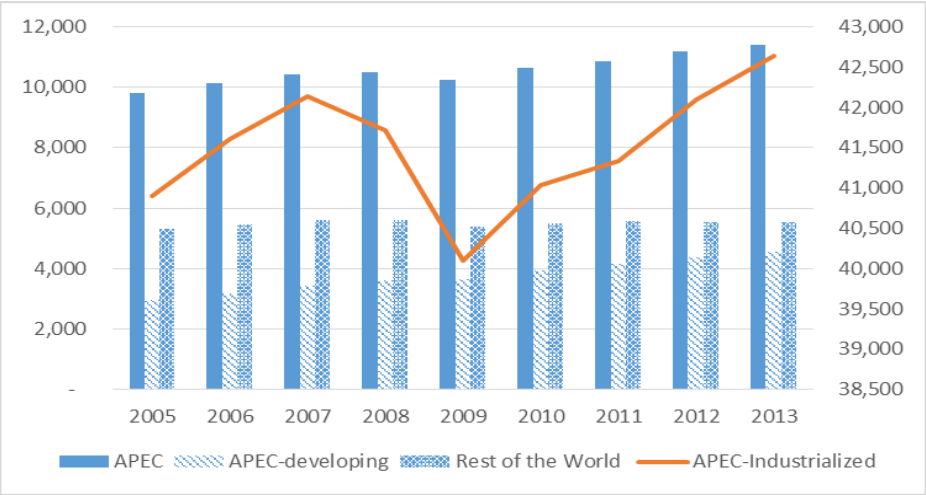
APEC represents approximately 57 percent of the world GDP. Without any doubt, the APEC region has experienced a rapid growth in recent years. Between 2005 and 2013, the APEC region grew up at an annual average rate of 2.6 percent, outperforming the rest of the world, which grew up at 2 percent. Within APEC, developing economies' real GDP increased by 6.2 percent per year, while industrialized economies' real GDP went up by 1.2 percent per year.

Figure 3.1: Real GDP: APEC vis-à-vis the Rest of the World
USD billion, constant 2005 values

Source: StatsAPEC, World Bank, Chinese Taipei's Directorate General of Budget, Accounting and Statistics. APEC Secretariat, Policy Support Unit calculations.

This growth in GDP represents an enlargement of the available wealth in the region. It is a bigger "pie" that can be shared. Indeed, APEC's real GDP per capita increased during the same period at an average annual growth of 1.9 percent, greater than the growth experienced by the rest of the world (only 0.5 percent per year). For APEC-developing economies, real GDP per capita went up by 5.5 percent per year. APEC-industrialized economies also increased, but at a lower growth rate (0.5 percent per year).

Figure 3.2: Real GDP per Capita: APEC vis-à-vis the Rest of the World
USD, constant 2005 values



Source: StatsAPEC, World Bank, Chinese Taipei's Directorate General of Budget, Accounting and Statistics. APEC Secretariat, Policy Support Unit calculations.

As can be seen in Figure 3.2, the GDP per capita in APEC has followed an upward trend. Only in 2009, APEC's GDP per capita contracted due to global financial crisis, which mainly affected APEC-industrialized economies. By 2013, APEC's GDP per capita, measured in constant 2005 USD, reached USD 11,413, up from USD 9,825 in 2005, representing a 16.2 percent increase along this period. This means that not just the "pie" increased, but also the "slice" in the "pie" for the average person in APEC.

3.1.2 Factors of Production and Economic Growth in APEC

Economic growth relies on many different sources. The economic activity depends on the use of factors of production such as labor, land and capital. Having access to more labor, land or capital, could have a positive impact on growth, as there will be more resources to increase production[43].

Demographics has been an important factor in generating growth. As more people join the labor force, it is relatively easier to increase production. Economies with a great percentage of the population within working age have greater potential to grow. On the opposite, economies with an increasing percentage of the population in retirement age and low or declining birth rates will face economic growth challenges.

In recent years, the population in APEC has grown at small rates. Between 2005 and 2013, APEC's population increased in only 0.7 percent per year and the population within working age (i.e. between 15 and 64 years-old) increased in 0.8 percent per year. The lower population growth rates are also affecting the rate of growth of the labor force in APEC, which went up by 0.9 percent per year during the same period.

[43] Increasing more of one of the production factors (for example, labor), while keeping others constant, will generate lower incremental returns. Eventually, it is possible that adding more workers (labor) could cause negative returns and decrease production. For example, if the land size of a farm and the type of equipment to produce apples do not change, adding more workers could raise the production of apples only up to a certain point. If the number of workers keep increasing, they will face restrictions to work properly in the farm and production could decrease.

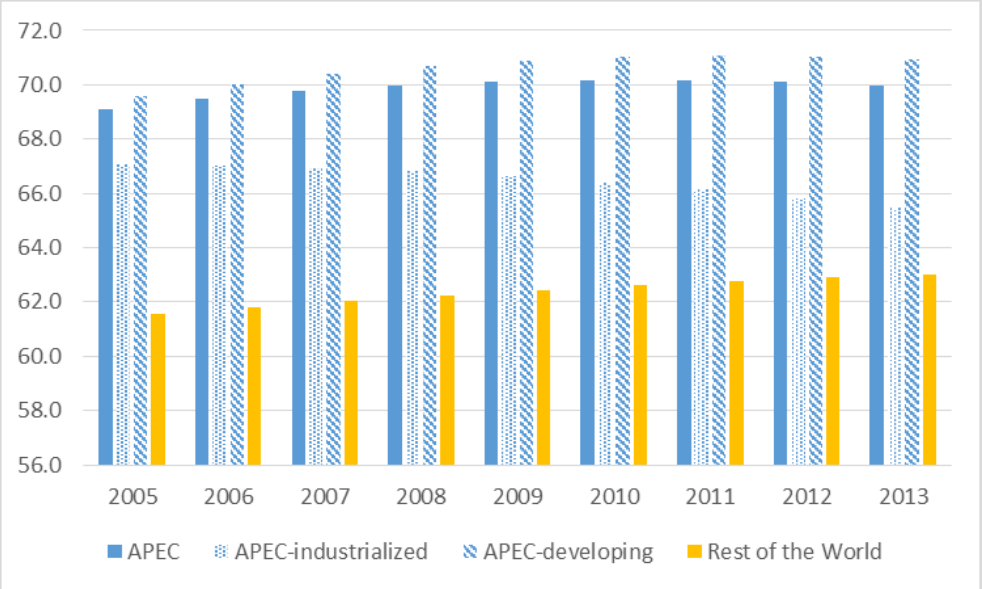
Table 3.1: Population and Labor Force: Average Annual Growth Rates (2005-2013)

	Total Population	Population, Ages 15-64	Labor Force
APEC	0.7%	0.8%	0.9%
APEC-Industrialized	0.7%	0.4%	0.5%
APEC-Developing	0.7%	0.9%	1.0%

Sources: StatsAPEC, World Bank. APEC Secretariat, Policy Support Unit calculations.

Figure 3.3 shows the share of the population within working age. Nearly 70 percent of the population in APEC is within working age, a greater percentage than that experienced by the rest of the world (65.7 percent in 2013). However, within APEC, two facts are noticeable: 1) the population within working age in APEC-developing economies increased in relative terms and was equivalent to 70.9 percent of the population in 2013; and 2) there has been a noticeable decline in the share of the population within working age in APEC-industrialized economies from 67.1 percent in 2005 to 65.5 percent in 2013. As this share continues declining, it could be much harder for industrialized economies to sustain their growth rates.

Figure 3.3: Population within Working Age (Age 15-64)
(percentage of total population)

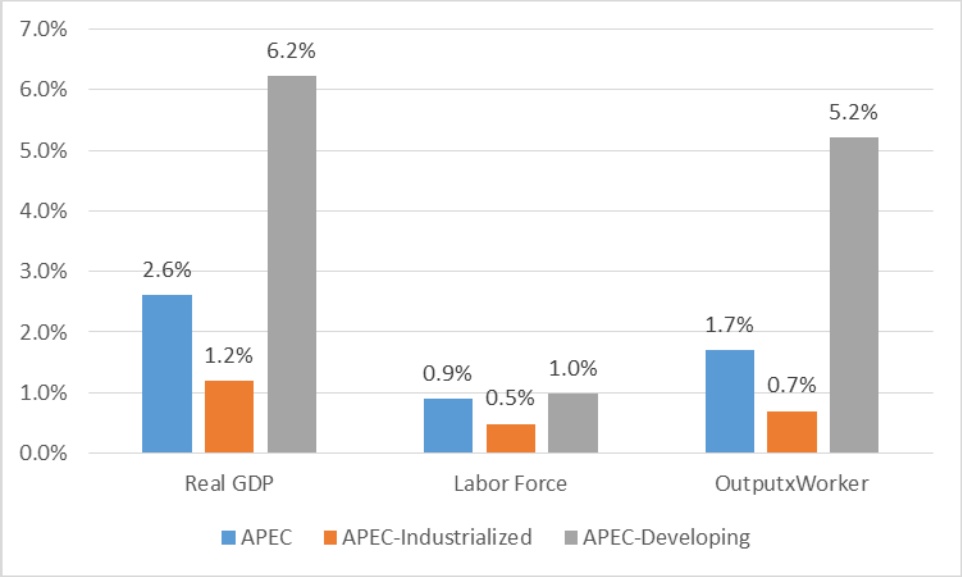


Source: StatsAPEC, World Bank. APEC Secretariat, Policy Support Unit calculations.

If population and labor force have been growing at lower rates than the real GDP in the APEC region, what other factors could be explaining growth in APEC? One factor is the increase in labor productivity in APEC. Output per worker levels in APEC have increased at faster rates than those for the labor force, particularly in APEC-developing economies (see Figure 3.4). Factors like higher education enrolment rates in primary and secondary levels in APEC and the increase in the number of tertiary education graduates in recent years, have contributed to

increase workers productivity[44]. More accessibility to training may also have contributed to the improvement of labor productivity as well[45].

Figure 3.4: Labor Force and Output per Worker: Annual Average Growth Rates (2005-2013)



Source: StatsAPEC, World Bank. APEC Secretariat, Policy Support Unit calculations.

Another factor explaining economic growth in APEC is the accumulation of capital, which raises any economy's production capacity. The evolution of the gross capital formation -which is measured by the additions to the existing fixed assets of the economy, such as land improvements; plants, machines and equipment purchases; construction of roads, railways, buildings, and other infrastructure, plus net changes in inventories- shows that APEC has been investing in capital in recent years (Figure 3.5). During the period 2005-2013, APEC increased its gross capital formation flows by 2.9 percent per year, higher than the real GDP growth rates (2.6 percent per year). Capital accumulation is likely to have had a positive effect on productivity. In fact, capital formation is important to put in place technological advances. Moreover, it helps to bring better organization and management processes[46].

Figure 3.5 shows that it is the APEC-developing economies the economies that have been investing actively in capital in recent years and getting closer to the levels reached by the APEC-industrialized economies. Their gross capital formation flows went up by 8.5 percent between 2005 and 2013, being Peru (14.3 percent); China (12.3 percent); Indonesia (9.9 percent); Singapore (9.9 percent); Malaysia (6.7 percent); and Papua New Guinea (6.5 percent), those economies that recorded the highest growth rates.

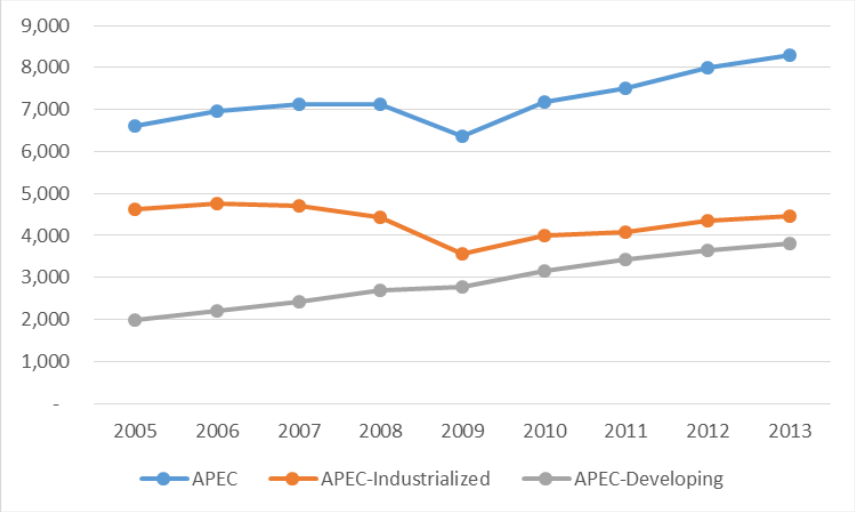
[44] Please see section on Inclusive Growth, which explains with more details the progress achieved by APEC economies in education.

[45] For instance, work-in-progress conducted by the APEC Policy Support Unit for the Policy Partnership on Women and The Economy shows that opportunities for women to accede to programs providing for SME support and development training have improved in recent years. An index developed by the Economic Intelligence Unit on the availability of SME training for women indicates a 5.2 percent improvement in the APEC region between 2010 and 2012.

[46] Wolff, Edward N. (1991). "Capital Formation and Productivity Convergence Over the Long Term", The American Economic Review, Vol. 81, No. 3, June, p. 566.

In the case of the APEC-industrialized economies, there are two marked phases in the evolution of the gross capital formation. The first one, between 2005 and 2009, when the gross capital formation declined by 6.2 percent per annum, as a consequence of the global financial crisis. The second one -during the 2009-2013 period- coinciding when the measures to recover from the crisis started to have an impact on their economies, registered an increase in the gross capital formation by 5.8 percent per annum.

Figure 3.5: Evolution of the Gross Capital Formation in APEC (USD billion)



Source: World Bank, Chinese Taipei's Directorate General of Budget, Accounting and Statistics. APEC Secretariat, Policy Support Unit calculations.

3.1.3 Trade and Economic Growth in APEC

Another factor that affects economic growth is trade. A Policy Brief published by the APEC Policy Support Unit mentions that trade and economic growth are strongly interlinked, and this linkage has been particularly strong in APEC. The emphasis on economic openness in APEC have given access to producers and consumers to more products at a lower price and helped them to increase their productivity and export competitiveness[47].

As seen in Table 3.2, for the APEC region, a 1 percent increase in exports is associated with a 0.34 percent increase in GDP; and a 1 percent increase in imports is associated to a 0.24 percent increase in GDP. On the opposite, for the rest of the world, while a 1 percent increase in their exports is related to a 0.34 percent increase in their GDP; imports had no statistically significant correlation with GDP growth[48].

[47] Kuriyama, Carlos and Emmanuel San Andres (2014), "Trade and Economic Growth: 25 Years of a Stronger Relationship within APEC", Policy Brief No. 11, APEC Policy Support Unit, 20 October, p. 4-5.
[48] Ibid, p. 4.

Table 3.2: Exports and Imports Elasticity of Growth, 1989-2013

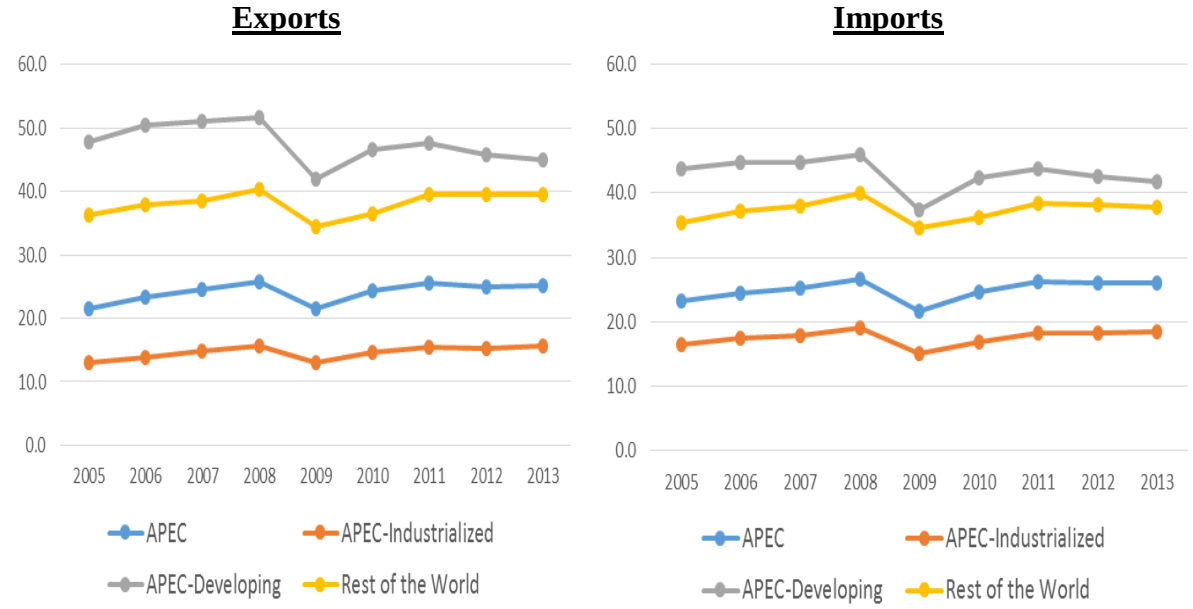
Variable	Elasticity (in %)	Observations	Overall R^2
APEC Economies			
Exports	0.313*	453	0.780
Imports	0.245*		
Rest of the World			
Exports	0.340*	2,878	0.881
Imports	0.041		

Note: * = significant at α = 1%
Source: APEC Secretariat, Policy Support Unit estimates.

According to the APEC Policy Support Unit, "*it is possible that that imports in APEC are contributing to domestic production and growth through global supply chains that most of the rest of the world have not been able to replicate in a similar fashion. Nowadays, companies are increasingly finding ways to improve efficiency by sourcing raw materials, parts/components and machinery/equipment from various economies and establishing production processes in different places, according to their comparative advantages. This is only possible by having smooth and open trade and investment policies, such as those being promoted by APEC since its inception, which allows firms to build production linkages across economies.*"[49]

The participation of APEC exports in GDP fluctuated around 21.5 and 25.2 percent between 2005 and 2013. Similarly, for APEC imports, it ranged between 21.6 and 26.6 percent. Trade represents a bigger percentage of the GDP for APEC-developing economies. Figure 3.6 shows that the participation of exports and imports in APEC-developing economies' GDP was above 40 percent along this period. In contrast, for APEC-industrialized economies, the share of exports and imports in their GDP was below 20 percent.

Figure 3.6: Participation of Exports and Imports in GDP



Source: World Bank, Chinese Taipei's Directorate General of Budget, Accounting and Statistics. APEC Secretariat, Policy Support Unit calculations.

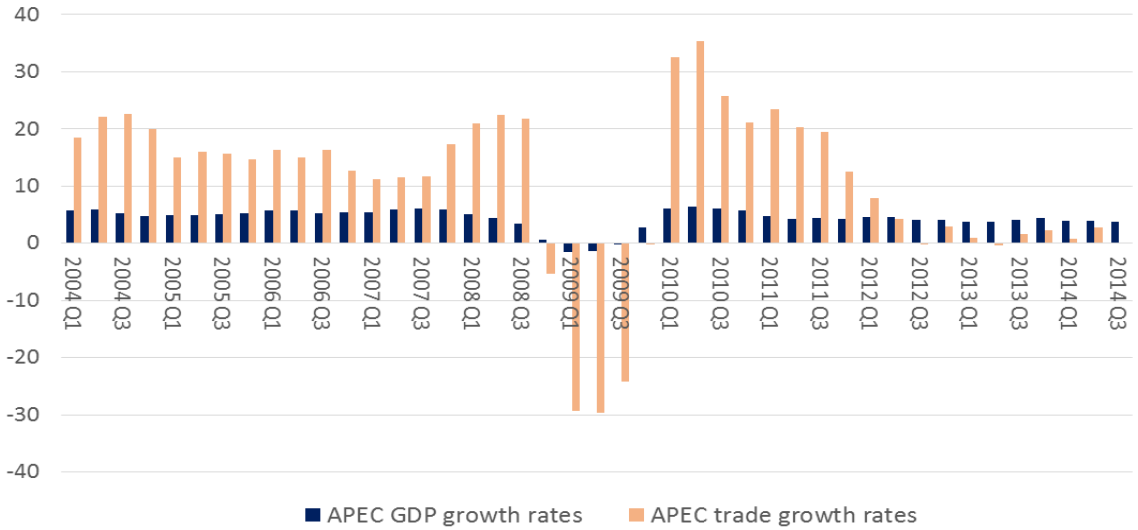
[49] Ibid, p. 4.

Another interesting feature in Figure 3.6 is that the participation of trade in GDP has been falling in APEC-developing economies in the years after the global financial crisis. From 2008 to 2013, their exports as a share of GDP went down from a "peak" of 51.5 percent to 44.9 percent. Imports as a percentage of GDP also fell from a "peak" of 45.9 percent to 41.8 percent. On the contrary, the participation of trade in APEC-industrialized economies' GDP has been increasing slightly after the global financial crisis. Their exports' participation went up from 13.0 percent in 2009 to 15.6 percent in 2013, equaling the "peak" achieved in 2008. Imports also increased their participation from 15.1 percent in 2009 to 18.4 percent in 2013, getting closer to the "peak" in 2008, equivalent to 19 percent.

These changes in the participation of trade in GDP indicate that APEC-developing economies are depending less on external markets and are starting to look more on domestic demand to fuel growth. In addition, the recovery of APEC-industrialized economies after the global financial crisis has not just implied a recovery of domestic demand, but also entailed somewhat a greater importance of external markets in generating economic growth. These two facts show a sort of "rebalancing" of growth within APEC.

When looking at the evolution of APEC's trade vis-à-vis APEC's GDP, it is possible to see a shift in the growth pattern. Figure 3.7 shows that trade was growing at much higher rates than GDP before the global financial crisis. The crisis caused a contraction of both GDP and trade, being the largest for the latter. The initial years after the crisis (2010 and 2011), trade experienced high growth rates, in part due to a statistical rebound. From 2012 onwards, trade has slowdown and has been posting lower growth rates than GDP.

Figure 3.7: APEC – Quarterly Change in Trade and GDP
(% year-on-year)



Source: Thomson Reuters Datastream and International Monetary Fund. APEC Secretariat, Policy Support Unit calculations.

The change in pattern after the global financial crisis confirms a greater impetus on companies focusing more on the domestic market, in particular in big developing economies. Internal demand has played a bigger role in the generation of growth. In addition, it is possible that the global financial crisis has impacted decisions by corporations regarding their global value chains. Since the 1990s, trade liberalization made it easier to move goods across the borders

and it became more common to produce parts and components in different markets, before the final product is assembled in another market. After the crisis, there has been a consolidation of global value chains, which may have slowed down trade. Cattaneo, Gereffi and Staritz (2010) mentioned that large firms are preferring larger, more capable, globally-operating, first-tier suppliers, and that the crisis was used by lead firms to consolidate their supply bases and focus on big companies with whom they have ongoing strategic relationships, reducing their preference for marginal suppliers[50].

However, recent evidence released by the International Monetary Fund (Constantinescu, Mattoo and Ruta (2015)), shows that the slowdown of the expansion of global value chains had already started in the early 2000s, well before the Global Financial Crisis. The ratio of foreign value added to domestic value added in world gross exports increased by 8.4 percentage points between 1995 and 2005, but by only 2.5 percentage points between 2005 and 2012[51]. In addition, the evidence shows that long-run trade elasticities in value-added terms (calculated on a seven-year rolling basis) are declining over time, which means that trade has been responding less to an increase in income[52], as "the technology shock of the 1990s has been absorbed and that the process of international production fragmentation has slowed down"[53].

3.2 BALANCED GROWTH

The Global Financial Crisis of 2007-08 attracted attention towards the importance of achieving a balanced growth to minimise the risk of an economic crisis and improve social and economic resilience. The APEC Growth Strategy defined balanced growth as macroeconomic policies and structural reforms that will gradually unwind imbalances and raise potential output.

In order to discuss how much progress APEC economies have done in implementing a balanced growth strategy, our focus in this section will be on the analysis of current account, fiscal balance, government fiscal position, savings and investments, competitive markets and public sector and corporate governance in the APEC region. The underlying idea is that sustainable current accounts, and healthy government budgets, supported by efficient domestic regulation environment and adequate infrastructure investment could increase competitiveness and generate a balanced growth across APEC.

3.2.1 Current Account

In 2005, APEC economies posted a current account deficit of 1.1 percent of the GDP, equivalent to USD 293 billion; whilst in 2014, APEC reported a current account surplus of 0.01 percent, equivalent to USD 2 billion. Table 3.3 shows the current account balance in APEC economies as percentage of GDP. An interesting finding is that among the 15 economies that reported a surplus in 2005, 12 of them reported a lower surplus or a deficit in 2014. In many of those cases, this is related to a fall or declining growth rates in the demand of their main exporting markets (i.e. industrialized economies and large developing economies). On the opposite, among the six APEC economies that experienced a current account deficit in 2005, five of them reported surpluses or lower deficits in 2014. It is possible that the economic

[50] Cattaneo, Oliver, Gary Gereffi and Cornelia Staritz (2010), "Global Value Chains in a Postcrisis World : A Development Perspective", World Bank, p. 16-17.
[51] Constantinescu, Cristina, Aaditya Mattoo and Michele Ruta (2015), "The Global Trade Slowdown: Cyclical or Structural?", IMF Working Paper, WP/15/6. p. 23.
[52] Ibid, p. 23 and 38.
[53] Ibid, p. 21.

slowdown caused by the global financial crisis also affected their domestic demands and therefore, reduced the rate of expansion of their imports[54].

Table 3.3: Current Account Balance as a Percentage of GDP, APEC Economies

Economy	**2005**	**2014**
Australia	-5.9	-2.8
Brunei Darussalam	47.3	23.6
Canada	1.9	-2.2
Chile	1.5	-1.2
China	5.8	2.0
Hong Kong, China	11.9	1.6
Indonesia	0.5	-3.0
Japan	3.7	0.5
Korea	1.4	6.3
Malaysia	14.4	4.6
Mexico	-1.0	-2.1
New Zealand	-7.1	-3.5
Papua New Guinea	14.0	-12.1
Peru	1.5	-4.1
Economy	2005	2014
Philippines	1.9	4.4
Russia	11.1	3.1
Singapore	21.9	19.1
Chinese Taipei	4.7	12.3
Thailand	-4.3	3.8
United States	-5.7	-2.4
Viet Nam	-1.0	5.4
APEC	**-1.1**	**0.01**

Source: IMF World Economic Outlook data, April 2015. APEC Secretariat, Policy Support Unit calculations.

It is difficult to say at what level current account deficit is being considered as acceptable or sustainable. For example, Summers (in Edwards 2004) mentioned that a current account deficit of 5 percent could be risky[55]. Heise et. al. (2010) maintain that markets tend to see large deficits as a sign of reduced competitiveness of an economy at the global market[56]. However, having a current account deficit is not necessarily a bad thing, if economies could keep those deficit at sustainable levels, by financing them with the arrival of continuous foreign investments, generating a surplus in the capital account. Moreover, having current account deficits explained by an increase of imports could also be positive in certain situations. For example, if those imports are related to the effective functioning of global value chains or to investment in gross fixed capital (i.e. machinery, equipment and infrastructure, among others) which are going to increase the potential production capacity of the economy.

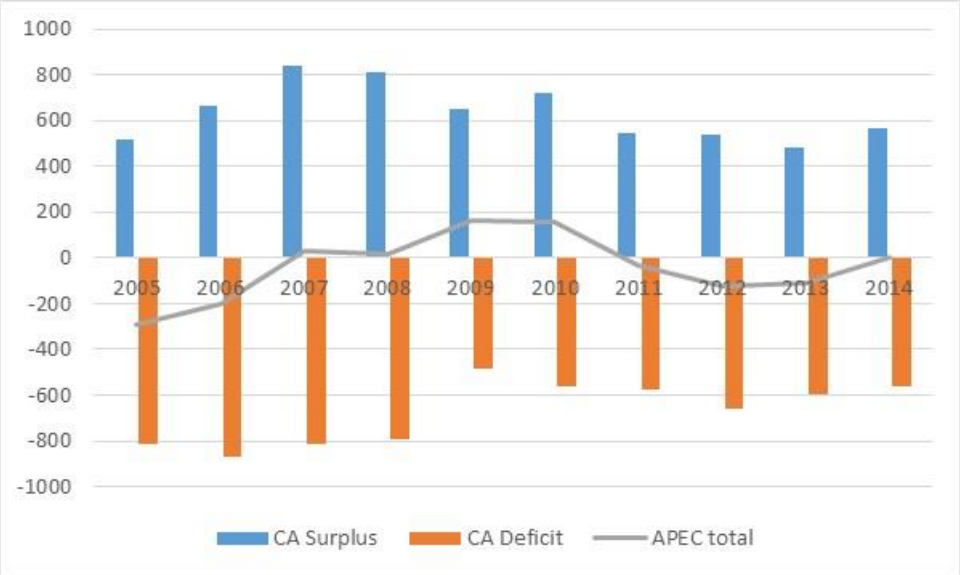
[54] Based on WTO trade data, APEC growth of total merchandise import has decreased from 13.3 percent per annum (period 2005-2008) to 13 percent per.annum (period 2009-2014).

[55] Edwards, Sebastian (2002). "Does the Current Account Matter?" NBER working paper W8275, http://www.nber.org/chapters/c10633.

[56] Heisse, Michael et.al. (2010), "The EURO Monitor 2010: Indicators for Balanced Growth", Allianz Economic Research & Corporate Development, http://www.lisboncouncil.net/publication/publication/62.html

The APEC region experienced a low current account deficit in 2005 and 2006 of 1.1 percent and 0.7 percent of the GDP, respectively; and a surplus from 2007-2010 before experiencing a deficit again (albeit much smaller) from 2011-2013. The nominal value of APEC current account balance improved from a deficit of USD 293 billion (-1.1 percent of APEC GDP) in 2005 to a surplus of USD 2 billion in 2014 (0.01 percent of APEC GDP).

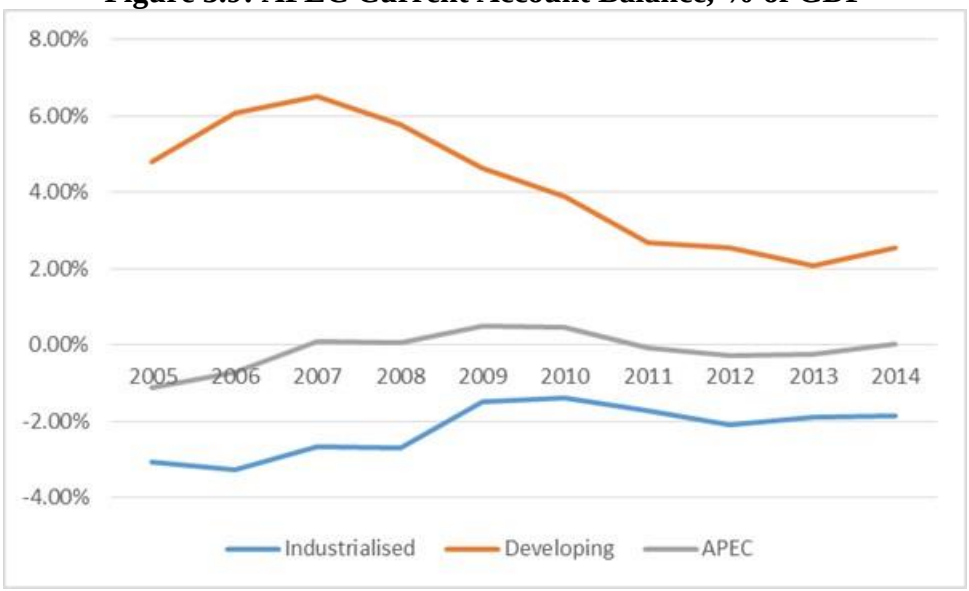
Figure 3.8: APEC Current Account (USD billion)



Source: IMF World Economic Outlook data, April 2015. APEC Secretariat, Policy Support Unit calculations.

APEC industrialized economies' current account deficits fell from -3.1 percent in 2005 to -1.9 percent in 2014. For developing economies, their surplus decreased from 4.8 percent in 2005 to 2.6 percent in 2015. The gaps between these two groups have narrowed over time.

Figure 3.9: APEC Current Account Balance, % of GDP



Source: IMF World Economic Outlook data, April 2015. APEC Secretariat, Policy Support Unit calculations.

3.2.2 Fiscal Balance

In terms of the overall fiscal balance (net lending (+)/borrowing (–)) of the general government, in 2005, most APEC economies reported surpluses in their fiscal balances, ranging from 18 percent to 0.9 percent of their corresponding GDP. In 2009, only two APEC economies reported a fiscal surplus due to the expansionary fiscal policies implemented by several economies to recover from the effects of the global financial crisis, with deficits ranging from 13.5 percent to 0.6 percent. By 2014, the fiscal position in 19 out of 21 APEC economies improved in comparison to 2009. Three APEC economies reported fiscal surpluses and the largest fiscal deficit recorded was equivalent to 7.7 percent (see Table 3.4).

During times of recession, budget deficits provide the source of (temporary) boost for the aggregate demand and thus, generate economic growth. Nevertheless, continuous budget deficits could increase macroeconomic risks in economies and reach unsustainable debt levels, which in turn could also create an upward pressure to interest rates. In this sense, it is positive that most APEC economies have improved their fiscal position in 2014 in comparison with 2009 figures. Economies with fiscal discipline will be more resilient under recession, since the generation of fiscal surpluses (or even very low budget deficits) may allow them to have more room for fiscal policy options to support domestic demand[57]. On the contrary, economies with high fiscal deficits have problems to support aggregate demand and at the same time, need to build financial market confidence due to the increasing problems in the ability to service existing debts.

Table 3.4: Fiscal balances: General government Net Lending/Borrowing[58], 2005-2014 (% of GDP)

Economy	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Australia	1.7	1.8	1.5	-1.1	-4.6	-5.1	-4.5	-3.4	-3.0	-3.6
Brunei Darussalam	18.0	22.1	3.4	40.0	3.8	8.4	28.1	16.9	14.1	14.1
Canada	1.7	1.8	1.5	-0.3	-4.5	-4.9	-3.7	-3.1	-2.8	-1.8
Chile	4.5	7.4	7.9	4.1	-4.1	-0.4	1.4	0.7	-0.5	-1.4
China	-1.4	-1.1	0.1	0.0	-1.8	-1.2	0.6	0.0	-1.1	-1.1
Hong Kong, China	1.1	4.1	8.1	0.1	1.5	4.4	4.1	3.3	1.1	5.3
Indonesia	0.4	0.4	-0.9	0.1	-1.6	-1.2	-0.6	-1.6	-2.0	-2.2
Japan	-4.8	-3.7	-2.1	-4.1	-10.4	-9.3	-9.8	-8.8	-8.5	-7.7
Korea	0.9	1.1	2.2	1.5	0.0	1.5	1.7	1.6	0.7	0.3
Malaysia	-3.0	-2.7	-2.7	-3.6	-6.7	-4.7	-3.7	-3.9	-4.4	-3.7
Mexico	-1.2	-1.0	-1.2	-1.0	-5.1	-4.3	-3.3	-3.7	-3.8	-4.6
New Zealand	4.7	4.3	3.4	1.5	-1.5	-5.0	-4.8	-1.6	-0.8	-0.6
Papua New Guinea	2.7	6.5	9.0	2.5	-9.6	3.1	1.7	-3.2	-8.0	-6.1
Peru	-0.4	2.0	3.3	2.7	-1.7	0.0	2.2	1.9	0.7	-0.1
Philippines	-1.7	0.0	-0.3	0.0	-2.7	-2.4	-0.4	-0.6	-0.1	0.5
Russia	8.1	8.4	6.0	4.9	-6.3	-3.4	1.5	0.4	-1.3	-1.2
Singapore	7.8	7.0	11.8	6.4	-0.6	6.6	8.5	7.8	5.4	4.2
Chinese Taipei	-2.5	-2.2	-2.2	-2.7	-6.2	-5.1	-4.0	-4.3	-3.2	-2.5
Thailand	1.5	2.2	0.2	0.1	-3.2	-0.8	-0.6	-1.8	-0.2	-1.8
United States	-3.4	-2.4	-3.2	-7.0	-13.5	-11.3	-9.9	-8.6	-5.8	-5.3
Viet Nam	-1.2	0.3	-2.0	-0.5	-6.0	-2.8	-1.1	-6.8	-5.9	-5.4

Source: IMF World Economic Outlook data, April 2015. APEC Secretariat, Policy Support Unit calculations.

[57] The World Bank (2015) noted that: "fiscal multipliers (i.e., the impact of fiscal policy on activity) in emerging market and frontier market economies tend to be larger when fiscal space is wider." (Global Economic Prospects, January 2015)

[58] Net lending (+)/ borrowing (-) is calculated as revenue minus total expenditure. This indicator measures the extent to which general government is either putting financial resources at the disposal of other sectors in the economy and nonresidents (net lending), or utilizing the financial resources generated by other sectors and nonresidents (net borrowing). This balance may be viewed as an indicator of the financial impact of general government activity on the rest of the economy and nonresidents (IMF, Global Finance Statistics Manual 2001, paragraph 4.17).

APEC-developing economies tend to have more favourable fiscal balance condition compared with the industrialised economies. One of the reasons is because the global financial crisis affected more extensively to industrialized economies, which had to use more aggressive expansionary fiscal policies to fight the crisis. Another reason is that investors usually consider developing economies with higher risk, and in order to gain an "investment grade", governments from developing economies have the incentive to maintain good fiscal balance records.

Figure 3.10 shows that the APEC-industrialised economies' fiscal condition has actually improved significantly, particularly from the global financial crisis (year 2009). In 2009, the fiscal deficit for industrialised economies was equal to 11.8 percent of the GDP; while in 2014, the deficit went down to 5.4 percent of the GDP.

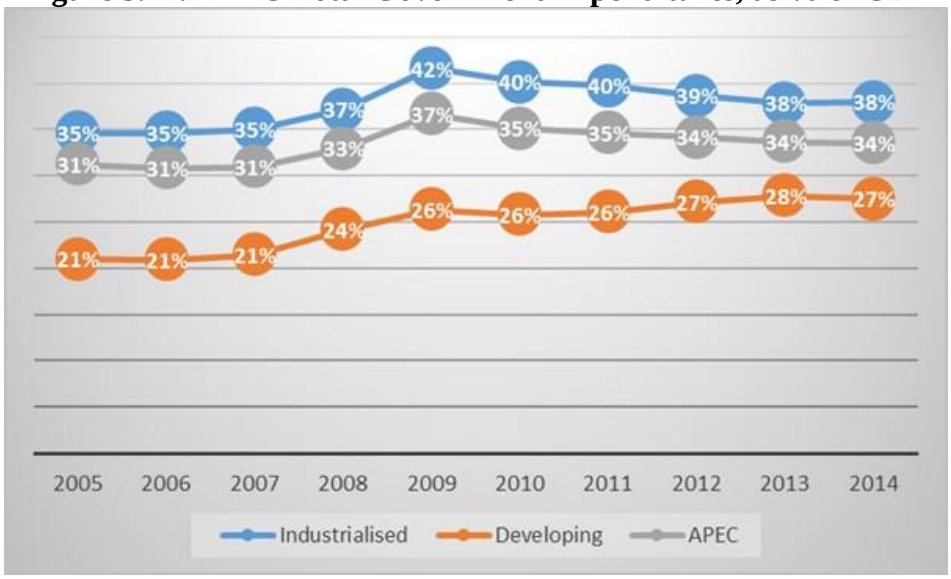
Figure 3.10: APEC Fiscal Balance, as % of GDP

Source: IMF World Economic Outlook data, April 2015. APEC Secretariat, Policy Support Unit calculations.

3.2.3 Government Spending and Debt

General government total expenditure in several APEC economies experienced large increases in 2008 and 2009 as a consequence of the measures to fight the global financial crisis. In terms of the level of government expenditure in APEC as percentage of the GDP, as seen in Figure 3.11, it slightly rose from 31 percent to 34 percent between 2005 and 2014. APEC-developing economies experienced the higher increase from 21 percent to 27 percent; while industrialized economies increased their relative spending from 35 percent to 38 percent of their GDP. As expected, the peak was reached in 2009, when government expenditure reached 42 percent for APEC-industrialized economies and 26 percent for APEC-developing economies.

Figure 3.11: APEC Total Government Expenditures, as % of GDP



Source: IMF World Economic Outlook data, April 2015. APEC Secretariat, Policy Support Unit calculations.

Government spending is an important component of domestic demand and as such plays a key role in stabilizing it. However, some economies may face restrictions to adjust government spending due to legal responsibilities in terms of paying salaries in the public sector and allocating a minimum required level of the budget in specific expenditures (for example, to education, health and defense sectors, among others). Focusing on productive spending such as investment on improving or building relevant infrastructure could be a viable option to further improve productivity and competitiveness. Bivens (2014) reported that, based on US data, each $1 billion in infrastructure investments could yields $1.6 billion in additional economic activity and roughly 11,000 net new jobs, if these investments are deficit-financed[59].

[59] Bivens, Josh (2014), "The Short- and Long-Term Impacts of Infrastructure Investments on U.S. Employment and Economic Activity (Executive Summary)", Economic Policy Institute, http://www.epi.org/publication/short-long-term-impacts-infrastructure-investments/.

Table 3.5: APEC General Government Total Expenditure (% of GDP), Percentage of Change

Economy	2006	2007	2008	2009	2010	2011	2012	2013	2014
Australia	-0.2%	-0.8%	2.1%	8.2%	-2.2%	-1.4%	0.4%	0.7%	1.6%
Brunei	-4.3%	5.5%	-7.3%	28.4%	3.6%	-17.8%	5.6%	8.3%	1.8%
Canada	0.6%	-0.5%	1.0%	11.1%	-0.5%	-3.2%	-1.5%	-1.0%	-3.2%
Chile	-7.5%	3.5%	12.1%	13.8%	-3.3%	-2.7%	2.1%	-0.1%	2.2%
China	-1.1%	1.9%	23.1%	12.9%	2.8%	3.1%	4.5%	3.3%	1.1%
Hong Kong, China	-9.0%	-3.6%	21.6%	-6.6%	2.2%	12.3%	-3.6%	9.0%	-12.4%
Indonesia	6.1%	1.3%	3.6%	-12.2%	-0.8%	4.6%	6.7%	1.6%	-1.9%
Japan	1.1%	-3.4%	7.3%	11.9%	-2.7%	4.4%	-1.8%	1.6%	-0.6%
Korea	3.1%	1.0%	1.7%	2.4%	-8.6%	2.1%	3.5%	1.7%	1.6%
Malaysia	4.2%	1.2%	4.0%	14.7%	-14.1%	1.8%	5.0%	-1.3%	-4.9%
Mexico	5.3%	2.0%	11.3%	4.7%	-1.0%	0.3%	2.1%	2.0%	0.1%
New Zealand	2.3%	-1.8%	4.5%	4.9%	7.7%	-0.8%	-8.6%	-2.6%	-1.6%
PNG	-5.5%	-7.7%	6.2%	22.6%	-23.7%	2.0%	12.8%	11.6%	3.9%
Peru	-5.5%	-2.5%	5.2%	9.4%	-2.5%	-5.0%	2.5%	6.0%	4.5%
Philippines	-2.2%	-0.6%	-1.8%	7.7%	-4.6%	-6.1%	5.0%	-1.4%	-1.1%
Russia	-1.4%	10.0%	0.2%	20.6%	-8.0%	-6.1%	4.4%	2.5%	0.3%
Singapore	5.2%	-6.3%	46.9%	2.3%	-19.2%	1.4%	-1.8%	11.3%	12.9%
Chinese Taipei	-6.9%	-2.2%	3.9%	14.1%	-10.8%	0.4%	-0.1%	-3.6%	-3.7%
Thailand	-4.8%	6.1%	-0.4%	13.1%	-3.2%	-0.1%	7.2%	-2.2%	-0.1%
United States	-0.5%	2.8%	6.7%	12.7%	-4.5%	-2.6%	-3.2%	-3.1%	0.4%
Viet Nam	-0.4%	7.8%	-3.7%	16.8%	-5.0%	-10.3%	9.1%	-2.1%	-6.9%

Source: IMF World Economic Outlook data, April 2015. APEC Secretariat, Policy Support Unit calculations.

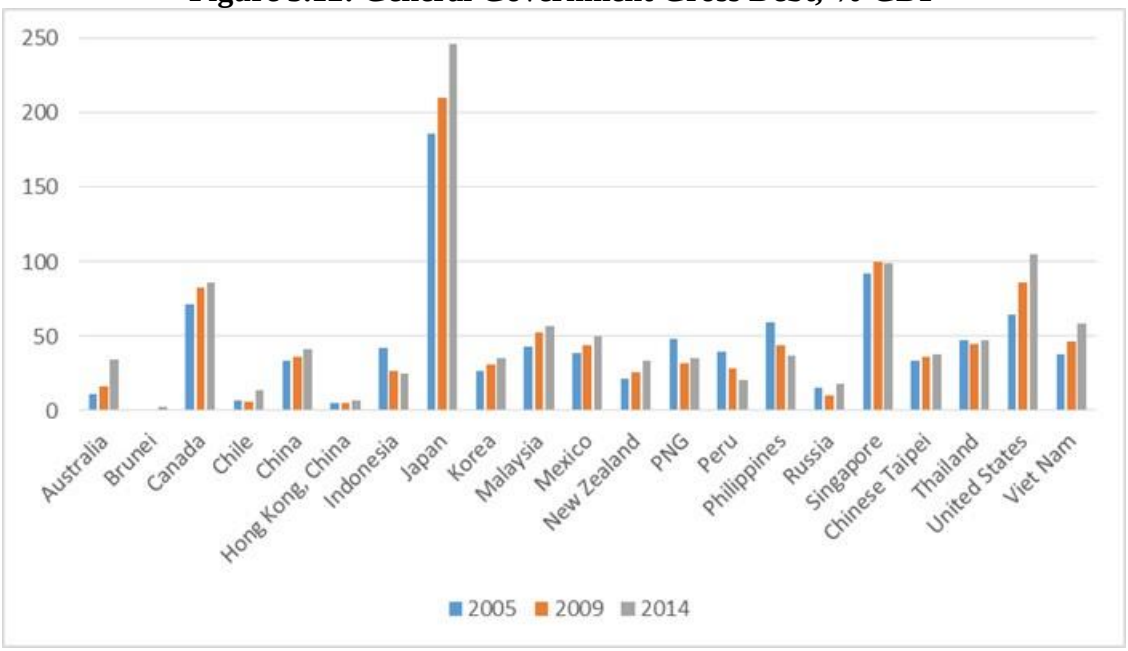
In terms of debt, as seen in Figure 3.12, most APEC economies have a debt-to-GDP ratio below 50%. There are several opinions of what level of debt are being considered 'safe' and sustainable. Reinhardt and Rogoff (2010)[60] claimed that too much debt causes recession[61] in addition to bring higher risk of financial crisis; while Krugman (2015) mentioned that while high debt ratio may cause some financial stability, efforts to reduce debt during recession could actually bring more harm than good[62].

[60] Reinhart, Carmen M. and Kenneth S. Rogoff (2010), NBER Working Paper No. 15639, http://www.nber.org/papers/w15639.

[61] Euro convergence criteria mentioned that government debt-to-GDP should be below 60%

[62] Krugman, Paul (2015), "Nobody Understands Debt" New York Times, The Opinion Pages, February 9, http://www.nytimes.com/2015/02/09/opinion/paul-krugman-nobody-understands-debt.html?_r=0

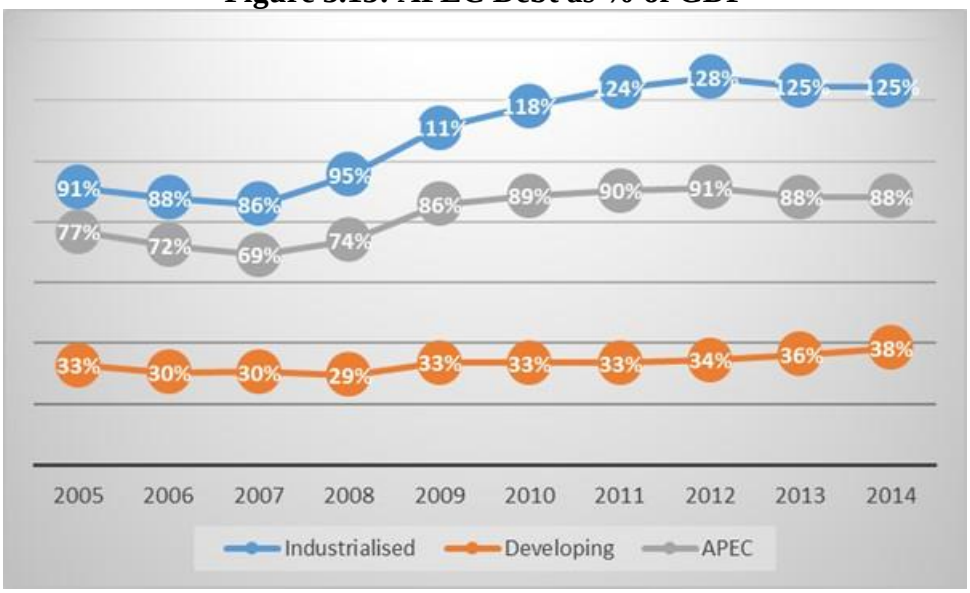
Figure 3.12: General Government Gross Debt, % GDP



Source: IMF World Economic Outlook data, April 2015. APEC Secretariat, Policy Support Unit calculations.

As a region, APEC debt to GDP ratio was equivalent to 77 percent in 2005 and increased to 88 percent by 2014. The gap between APEC-industrialized and developing economies has widened over time. While APEC-industrialized economies increased their debt ratio from 91 percent to 125 percent; APEC-developing economies' debt ratio went up from 33 percent to 38 percent.

Figure 3.13: APEC Debt as % of GDP



Source: IMF World Economic Outlook data, April 2015. APEC Secretariat, Policy Support Unit calculations.

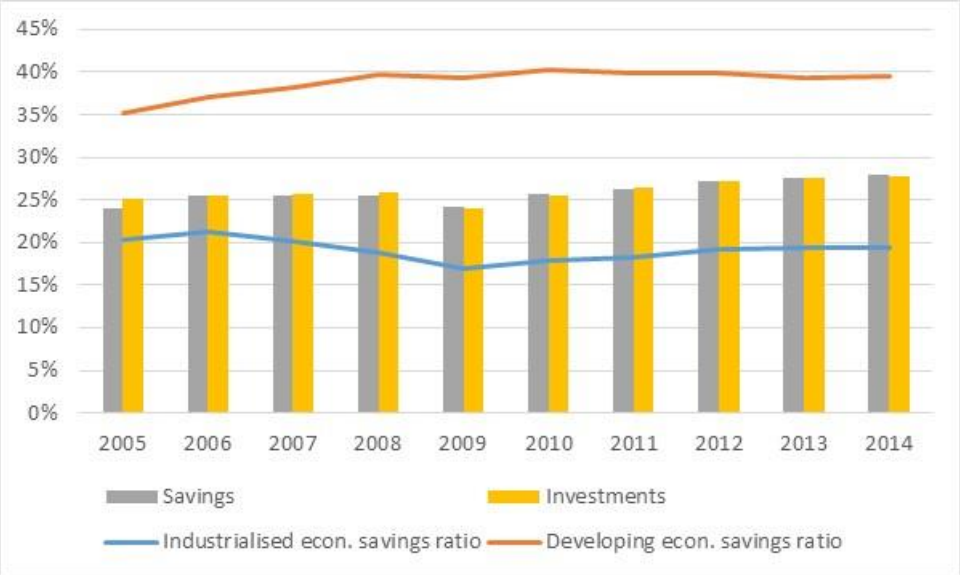
3.2.4 Savings and Investments, FDI and Infrastructure Development

Higher savings rate gives the opportunity to access to more capital for investment and support higher growth. The savings rates among APEC economies ranged from 17 percent to 47 percent of the GDP with a median of 27 percent in 2005. In 2014, the savings to GDP ratios ranged

from 8 percent to 49 percent, with a median of 24 percent. As a region, APEC's savings was equivalent to 24 percent of the regional GDP in 2005 and went up to 28 percent in 2014. Most APEC economies experienced a decline in their savings ratios in 2008, when the global financial crisis hit economies, but most of them recovered their savings ratios by 2010.

Figure 3.14 shows that APEC-developing economies have higher savings ratios compared with APEC-industrialized economies. During the period 2005-2014, the ratio for developing economies increased from 35 percent to 40 percent; while that for industrialized economies slightly decreased from 20 percent to 19 percent. As a region, APEC savings ratios are in general at the same level with its investments ratios.

Figure 3.14: APEC Savings and Investments Ratio (% of GDP)



Source: IMF World Economic Outlook data, April 2015. APEC Secretariat, Policy Support Unit calculations.

In 2010, APEC Leaders emphasized the importance to encourage balanced growth across economies by boosting domestic savings, particularly for economies with current account deficits. This increase in domestic savings should be pursued in the context of rebalancing growth in the long run, so it will not clash with the objective of pursuing economic recovery after the global financial crisis.

Regarding foreign direct investment (FDI), APEC FDI stocks represent around 46% of global FDI inward and outward stocks. The arrival of FDI is usually an important source of jobs and foreign currency for an economy. FDI inflows can increase the production capacity of an economy and encourage additional trade. Economies with increasing FDI inward stocks have better chances to sustain growth as well as to maintain a healthy balance of payments. FDI outward stocks are also important, as they allow firms to expand, diversify risks and generate additional profits overseas. In addition, firms investing overseas could create positive spillovers into domestic firms, as they could be part of

The stock of FDI in APEC as percentage of the world FDI stock is around 46 percent. Table 3.6 shows the size of the FDI inward and outward stock in the APEC region in relative terms (as percentage of the GDP). For APEC-developing economies, FDI inward stocks are generally greater than outward stocks, as it is easier and faster attracting foreign companies than increasing the competitiveness of local firms to compete in overseas markets. Nevertheless, in recent times, some developing economies such as Chile; China; Hong Kong, China; Korea;

Malaysia; Mexico; Russia; Chinese Taipei; and Thailand, have been increasing their FDI outward stock in relative terms, which indicates that some of their local firms are becoming more competitive in global markets.

For APEC-industrialized economies, the FDI outward stock was greater than FDI inward stocks in Canada; Japan; and the United States; as shown in table 3.6.

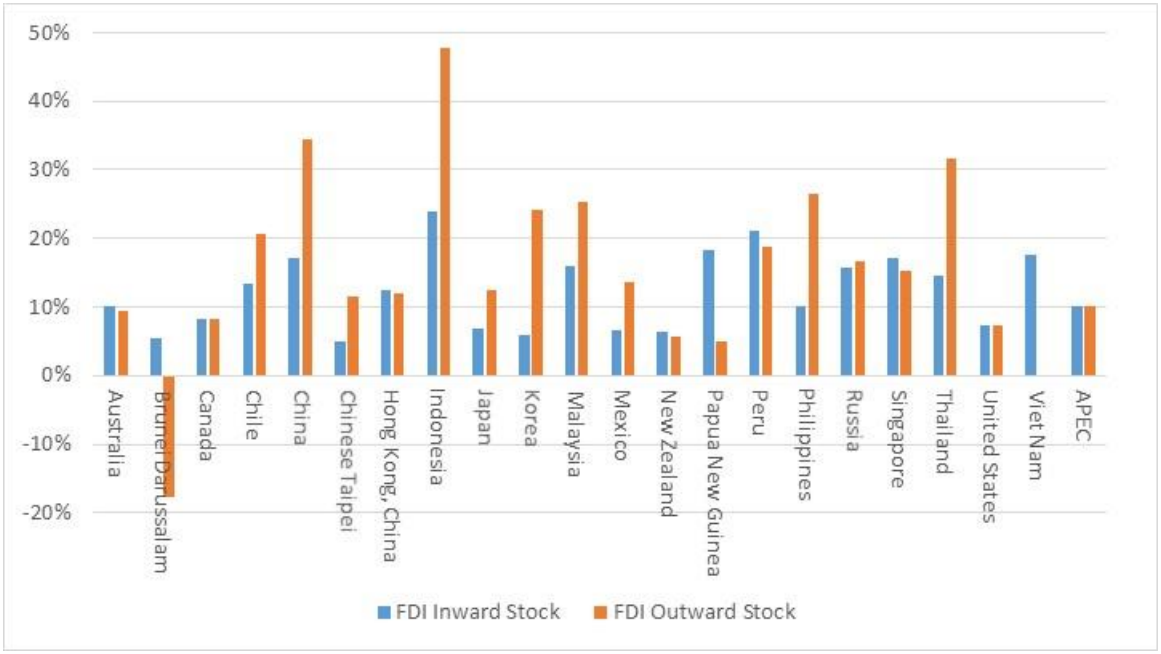
Table 3.6: APEC FDI Inward and Outward Stocks (% of GDP)

	FDI Inward Stocks		**FDI Outward Stocks**	
	2005	**2013**	**2005**	**2013**
Australia	35.7	39.3	30.2	31.3
Brunei Darussalam	96.8	87.7	6.7	0.8
Canada	29.3	35.3	33.4	40.1
Chile	63.9	77.8	18.4	36.8
China	11.9	10.4	2.5	6.7
Hong Kong, China	313.2	548.5	303.5	513.7
Indonesia	14.4	26.5	-0.6	1.8
Japan	2.2	3.5	8.5	20.3
Korea	12.4	13.7	4.6	17.9
Malaysia	31.0	46.3	15.4	42.9
Mexico	27.1	30.9	6.0	11.4
New Zealand	45.3	46.3	10.4	10.2
Papua New Guinea	22.0	25.6	4.4	2.0
Peru	20.0	35.6	1.3	2.0
Philippines	14.5	12.0	2.0	4.8
Russia	23.6	27.2	19.2	23.7
Singapore	189.0	283.2	127.4	168.3
Chinese Taipei	12.1	13.0	28.9	50.6
Thailand	33.3	47.9	3.4	15.1
United States	21.4	29.4	27.6	37.8
Viet Nam	39.0	47.9	n.a.	n.a.
APEC	**20.9**	**27.4**	**21.8**	**28.4**
APEC FDI Stock as % of World	**46.6%**	**46.3%**	**45.5%**	**46.4%**

Source: UNCTAD World Investment Report. APEC Secretariat, Policy Support Unit calculations.

Between 2005 and 2013, both APEC's FDI inward and outward stock grew up at an annual average rate of 10 percent. Figure 3.15 shows that FDI inward stocks increased in all APEC economies, being APEC-developing economies such as Indonesia; Peru; Papua New Guinea; Viet Nam; Singapore; and China, those posting the largest growth rates. Similarly, FDI outward stocks increased the most in percent terms in APEC-developing economies such as Indonesia; China; Thailand; Philippines; Malaysia; Korea; and Chile, which reflects the progress by firms from those economies in gaining competitiveness.

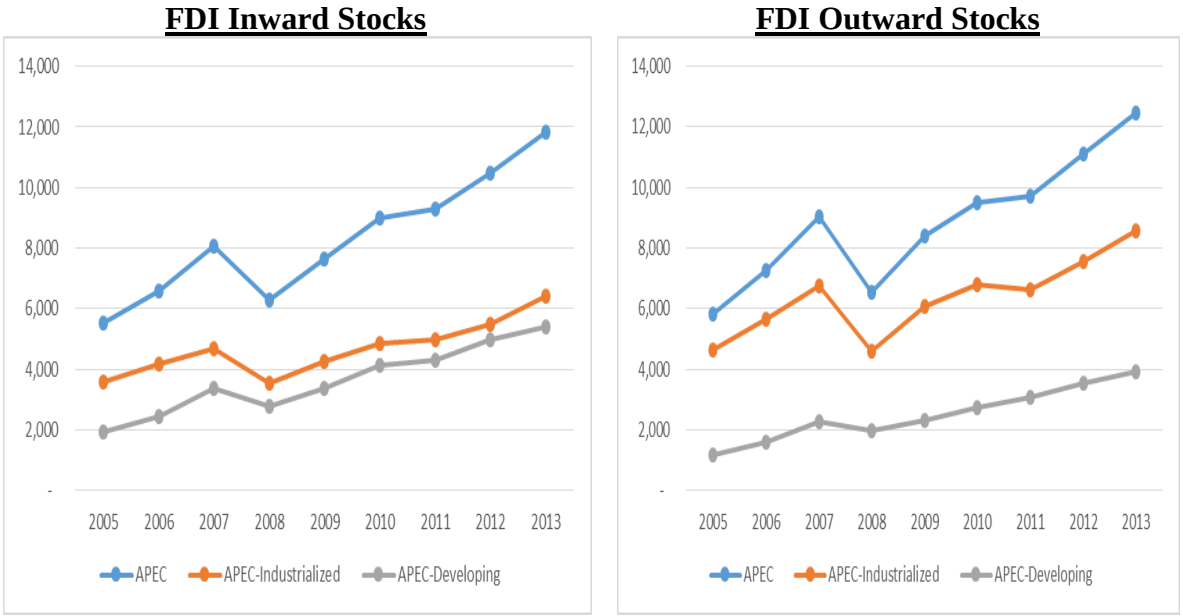
Figure 3.15: Annual Average Growth Rates of FDI Inward and Outward Stocks 2003-2013



Source: UNCTAD World Investment Report. APEC Secretariat, Policy Support Unit calculations.

As seen in Figure 3.16, APEC-industrialized economies are the main recipients of FDI, but their share in APEC has been declining. Their FDI inward stocks totaled USD 3.6 trillion in 2005 and represented 65 percent of the APEC's FDI inward stocks. In 2014, they were equivalent to USD 6.4 trillion in 2014, representing 54.3 percent of the APEC's FDI inward stocks. Regarding investments overseas, APEC-industrialized economies are also the main holders of FDI outward stock, as they increased their accumulated investments from USD 4.7 trillion to USD 8.6 trillion. However, their share declined from 80 percent to 68.7 percent.

Figure 3.16: Evolution of APEC FDI Inward and Outward Stocks USD billion



Source: UNCTAD World Investment Report. APEC Secretariat, Policy Support Unit calculations.

Despite improvements in infrastructure quality and the increase of physical infrastructure in a number of APEC economies, it is clear that more investment in infrastructure is needed in the APEC region to address growth challenges. The amount of funds needed to finance infrastructure around the world through 2030 is estimated to reach USD 57 trillion[63]. This will represent an annual gap of USD 500 billion to USD1.5 trillion, assuming 2 to 3 percent of government spending on infrastructure respectively[64]. Better PPP frameworks, as well as more high quality pipeline of infrastructure projects, will facilitate closing this gap.

About infrastructure, the World Economic Forum's Global Competitive Index measures the quality of infrastructure[65] on four modes of transport, APEC's average scores have shown improvements from 2006 to 2014, except for air transport infrastructure. The scores for APEC-industrialized economies have been consistently above the global average, despite the fact that scores were lower in 2014 compared with 2006. APEC developing economies have shown significant improvements on all modes of transport, except for air transport. Gaps between APEC-industrialized and developing economies are still significant; but they are getting smaller over time.

Table 3.7: Quality of Infrastructure 2006-2014, APEC Economies

	Overall		Air		Port		Rail		Road	
Economy	2006-07	2014-15	2006-07	2014-15	2006-07	2014-15	2006-07	2014-15	2006-07	2014-15
Australia	5.5	5.1	6.1	5.5	5.1	5.0	4.1	4.0	5.2	4.8
Canada	6.0	5.6	6.0	5.9	5.7	5.5	5.2	4.8	5.7	5.3
Chile	5.0	4.7	5.6	5.0	4.9	5.0	2.1	2.5	5.3	5.1
China	3.3	4.4	3.8	4.7	3.6	4.6	4.1	4.8	4.0	4.6
Hong Kong, China	6.4	6.5	6.6	6.6	6.5	6.5	6.5	6.3	6.3	6.0
Indonesia	2.8	4.2	4.1	4.5	2.8	4.0	2.8	3.7	2.1	3.9
Japan	6.1	6.2	6.2	5.5	6.0	5.3	6.6	6.7	6.1	5.9
Korea	5.2	5.5	5.5	5.4	5.3	5.3	5.7	5.6	5.2	5.6
Malaysia	5.8	5.6	6.0	5.7	5.8	5.6	4.8	5.0	5.7	5.6
Mexico	3.6	4.2	4.8	4.6	3.4	4.3	2.3	2.8	3.8	4.4
New Zealand	5.0	5.1	5.8	5.9	5.6	5.8	3.7	3.7	4.4	4.9
Peru	2.6	3.5	3.3	4.0	2.2	3.7	1.8	1.9	2.6	3.2
Philippines	2.6	3.7	4.0	3.6	2.8	3.5	1.7	2.3	2.6	3.6
Russia	2.8	4.1	4.3	4.1	3.5	3.9	3.9	4.3	2.2	2.7
Singapore	6.7	6.3	6.9	6.8	6.8	6.7	5.7	5.6	6.7	6.1
Chinese Taipei	5.4	5.5	5.8	5.3	5.5	5.3	5.8	5.7	5.9	5.9

[63] McKinsey Global Institute (2013), "Infrastructure productivity: How to save $1 trillion a year", January.
[64] Standard&Poor (2014), "Global Infrastructure: How to fill a $500 Billion Hole", available at http://www.standardandpoors.com/ratingsdirect.
[65] The 'quality of infrastructure' figures in table 3.7 are based on the World Economic Forum (WEF) Executive Opinion survey. The WEF survey asked the questions, in general, in the following format: How would you assess the quality of infrastructure (e.g., road, railroad, seaports, general infrastructure) in your economy? [1 = extremely underdeveloped—among the worst in the world; 7 = extensive and efficient—among the best in the world]. The 2014 edition of the Survey captured the opinions of over 14,000 business leaders in 148 economies between February and June 2014. (Source: The WEF Global Competitiveness Report 2014–2015).

Thailand	4.9	4.1	5.5	5.3	4.6	4.5	3.0	2.4	5.0	4.5
United States	6.2	5.8	6.4	6.1	5.8	5.7	4.8	4.9	6.1	5.7
Viet Nam	2.6	3.3	3.7	4.0	2.7	3.7	2.8	3.0	2.5	3.2
APEC Average	***4.7***	***4.9***	***5.3***	***5.2***	***4.7***	***4.9***	***4.1***	***4.2***	***4.6***	***4.8***
APEC Industrialised	***5.8***	***5.5***	***6.1***	***5.8***	***5.6***	***5.5***	***4.9***	***4.8***	***5.5***	***5.3***
APEC Developing	***4.0***	***4.4***	***4.7***	***4.6***	***4.0***	***4.4***	***3.5***	***3.7***	***4.0***	***4.3***
Global average	*3.8*	*4.2*	*4.5*	*4.4*	*3.8*	*4.1*	*n.a.*	*n.a.*	*3.7*	*4.0*

Note: Scale 1-7 (best), data is available for 19 APEC economies.
Source: World Economic Forum (WEF) Global Competitiveness Index. APEC Secretariat, Policy Support Unit calculations.

3.2.5 Competitive Markets: Intensity of Domestic Competition

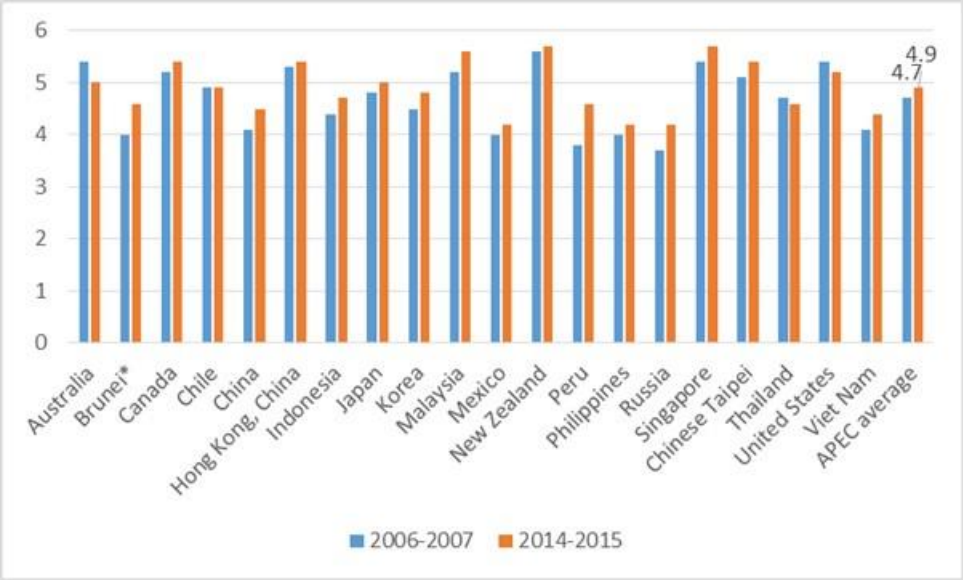
A competitive business environment is also required to support balanced growth. Vibrant domestic competition will incentivize firms to innovate and keep their competitiveness. An economy with many competitive firms will be able to create new jobs and improve income levels. Competitive markets will also attract Foreign Direct Investment that will further support a stable current account and currency.

Using the World Economic Forum's Global Competitiveness Index data on the intensity of domestic competition, where higher values on the scale from 1 to 7 indicate better competition conditions, APEC average scores slightly increased from 2006 to 2014, from 4.7 to 4.9 points. Comparing the value of domestic competition indicator by economy in this period, only two economies being reported to have lower scores in 2014. The average score for APEC-industrialized economies stayed constant at 5.3 points; whereas the average for APEC-developing economies went up from 4.5 to 4.8 points.

Structural reforms consisting on improvements to make markets more competitive could support firms to maintain their efficiency behavior and to remain innovative. As Porter (1990) emphasized: *"A nation's competitiveness depends on the capacity of its industry to innovate and upgrade. Companies gain advantage against the world's best competitors because of pressure and challenge. They benefit from having strong domestic rivals, aggressive home-based suppliers, and demanding local customers."* [66]

[66] Porter, Michael E. (1990), "The Competitive Advantage of Nations", Harvard Business Review, March–April.

Figure 3.17: Intensity of Domestic Competition, APEC Economies



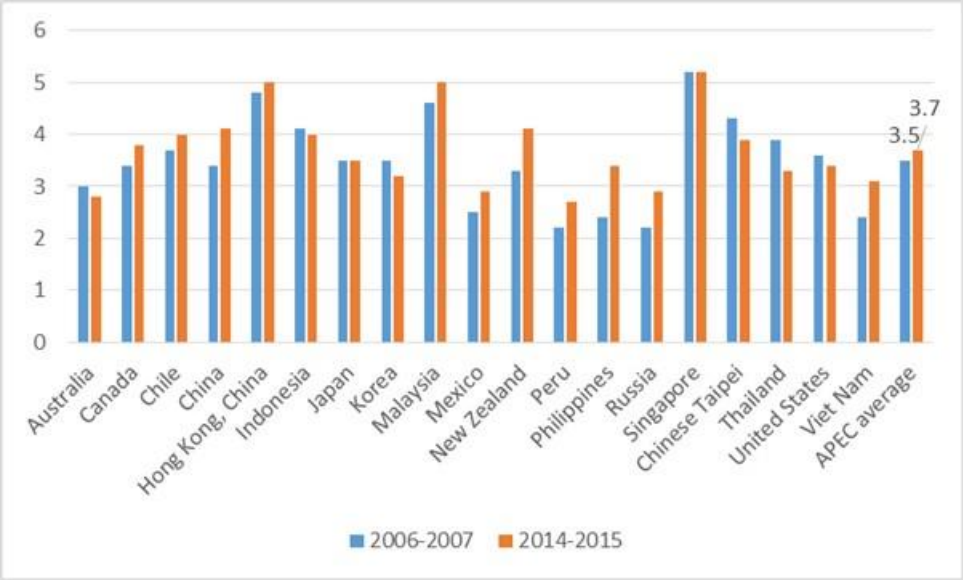
Note: Scale 1-7 (best), data is available for 20 APEC economies.
Source: World Economic Forum (WEF) Global Competitiveness Index. APEC Secretariat, Policy Support Unit calculations.

3.2.6 Public Sector and Corporate Governance: Burden of Government Regulation

Existing government regulations could impose significant costs to business and could also act as business barriers, particularly to small companies. While regulations are being applied for valid and justifiable reasons (i.e. to serve public interests), governments would need to ensure the compliance costs for public regulations to be set at the most efficient and reasonable level.

The World Economic Forum indicator of burden of government regulation shows the perception from business executives on how burdensome it is to comply with public administrative requirements. Bearing in mind that to comply with regulations would entail direct and indirect costs including time and resources spent that could otherwise be utilized for other things, high burden imposed by public regulations could lessen the profitability of existing business as well as deter entrance for new companies.

Figure 3.18: Burden of Government Regulation, APEC Economies



Note: Scale 1-7 (best), data is available for 20 APEC economies.
Source: World Economic Forum (WEF) Global Competitiveness Index. APEC Secretariat, Policy Support Unit calculations.

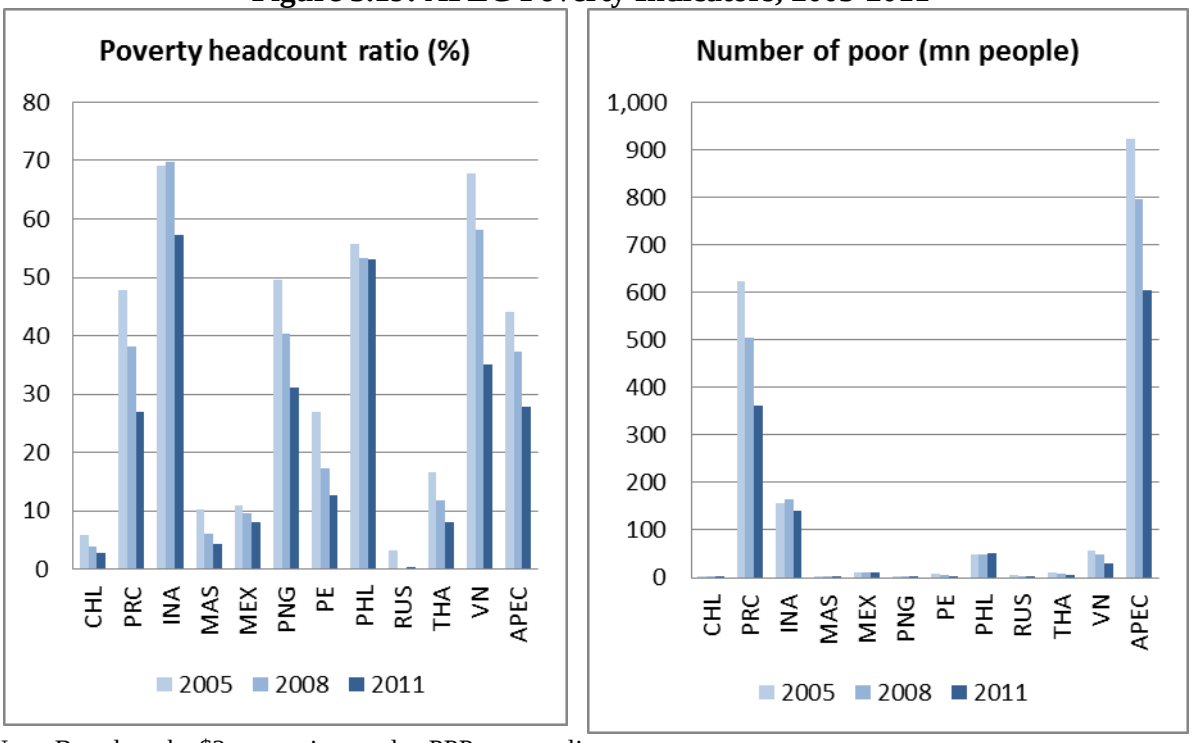
APEC average scores concerning the burden of government regulation were higher than the world average scores, both in 2006 and 2014. While APEC experienced a slight increase from 3.5 to 3.7 points in that period; the world average only increased from 3.1 to 3.4 points. APEC-developing economies did better in comparison with their industrialized counterparts. In the case of APEC-developing economies, the average score went up from 3.5 to 3.8 points; while the average score for APEC-industrialized economies increased only from 3.4 to 3.5 points.

3.3 INCLUSIVE GROWTH

APEC has experienced significant reduction in poverty over the past decade. Based on the World Bank's PovCal database—which provides cross-economy comparable estimates of poverty indicators for similar years—the poverty rate for 11 developing APEC economies[67] (based on the $2 per person per day PPP poverty line) has decreased from 44.1 percent in 2005 to 27.7 percent in 2011. This represents an annual reduction of 5.7 percent in the number of people living below $2 per day in the region during the period, from 923.3 million poor people in 2005 to 605.3 million people in 2011. In all these 11 economies, the poverty rate has gone down between 2005 and 2011, albeit at different rates (Figure 3.19). China and Viet Nam are the two economies that have experienced a rapid reduction in poverty rates between 2005 and 2011.

[67] These economies are Chile; China; Indonesia; Malaysia; Mexico; Papua New Guinea; Peru; the Philippines; Russia; Thailand; and Viet Nam.

Figure 3.19: APEC Poverty Indicators, 2005-2011



Note: Based on the $2 per capita per day PPP poverty line.
Source: WB PovCal database. APEC Secretariat, Policy Support Unit calculations.

APEC performance on inequality, on the other hand, is more mixed. Based on data from the World Bank, inequality as measured by the Gini index[68] has decreased in eight APEC economies and increased in four economies between 2004 and 2012. Rising inequality does not imply rising poverty; it is still possible to achieve poverty reduction and alleviation even with rising inequality. However, in those APEC economies with rising inequality and increasing average incomes, poor households are benefiting from economic growth proportionally less than rich ones[69].

Table 3.8: Gini Index, 2004-2012

	Initial		Latest	
Canada	33.9	(2004)	33.7	(2010)
Chile	51.8	(2006)	50.8	(2011)
China	42.5	(2005)	37.0	(2011)
Indonesia	34.0	(2005)	38.1	(2011)
Malaysia	37.9	(2004)	46.2	(2009)
Mexico	51.1	(2005)	48.1	(2012)
Peru	49.3	(2005)	45.3	(2012)
Philippines	44.0	(2006)	43.0	(2012)
Russia	38.3	(2005)	39.7	(2009)

[68] The Gini index measures the distribution of income in a population and ranges from zero to 100. An index score of zero would mean perfect equality where all individuals have identical incomes. On the other hand, a score of 100 would mean extreme inequality where one individual has all the income and the rest have none.
[69] Note that the Gini index is a relative measure of dispersion, so a 10% increase in the income of all individuals will not change the value of the index. Hence, if average incomes are growing, an increase in the Gini index means that the incomes of richer individuals are growing faster than average, while the incomes of poorer individuals are growing slower than average.

Thailand	42.4	(2006)	39.4	(2010)
United States	40.6	(2004)	41.1	(2010)
Viet Nam	36.8	(2004)	35.6	(2012)

Note: The Gini index ranges from zero to 100 (extreme inequality).
Source: WB World Development Indicators.

APEC's economic growth in the past decade has resulted in impressive poverty reduction. Hundreds of millions have been lifted out of income poverty in less than 10 years. Inequality has also generally gone down in the region during this period, indicating that the poorer segments of society are benefiting from economic growth.

Inclusive growth is not about making sure that everyone has the same income; rather, it is making sure that everyone has the opportunity and capability to participate in and benefit from that growth. Inclusive growth requires giving people the skills and providing the conditions that will reward an individual's hard work and innovation.

3.3.1 Skills Development and Employment

Skills development is essential to inclusive growth as this will provide people with the abilities that can open doors for gainful employment or entrepreneurship opportunities. Skills development through education and training can allow individuals to level the playing field in the jobs market (assuming a meritocratic labour market) and turn ideas into innovations. As such, providing equal access to quality education and training can help equalise earning opportunities, making economic growth more inclusive.

Most APEC economies provide wide access to basic education (i.e., primary and secondary schooling). To measure access to basic education, we look at two indicators: gross and net enrolment rates[70]. As can be seen in Table 3.9, gross and net enrolment rates at the primary level in APEC economies are around 90 to 100 percent, which means that almost all children who need to be in school are able to enrol. However, a high gross enrolment rate (GER) coupled with a low net enrolment rate (NER) is a sign that many pupils are being held back in their schooling. This can be seen in many APEC economies where GER levels are above 100 percent, and NER levels are close to or below 90 percent.

Table 3.9: Basic Education Enrolment Rates, 2012
(in percent)

	Primary		**Secondary**	
	Gross	**Net**	**Gross**	**Net**
Australia	105.0	96.8	136.0	85.3
Brunei Darussalam	95.5	91.7	108.0	94.7
Canada	98.3	n.a.	103.0	n.a.
Chile	101.0	92.7	89.0	84.1
China	128.0	n.a.	89.0	n.a.

[70] Gross enrolment rate (GER) is the ratio between the total number of enrolees at a specific level and the total number of children whose ages are appropriate for that level. For example, if primary schooling is meant for children aged 7-14, then the GER is the number of primary school enrolees regardless of age divided by the total number of children aged 7-14. The net enrolment rate (NER), on the other hand, is the age-appropriate ratio between enrolment and population. Thus, using the same example, the NER is the number of children aged 7-14 who are enrolled in primary school divided by the total number of children aged 7-14.

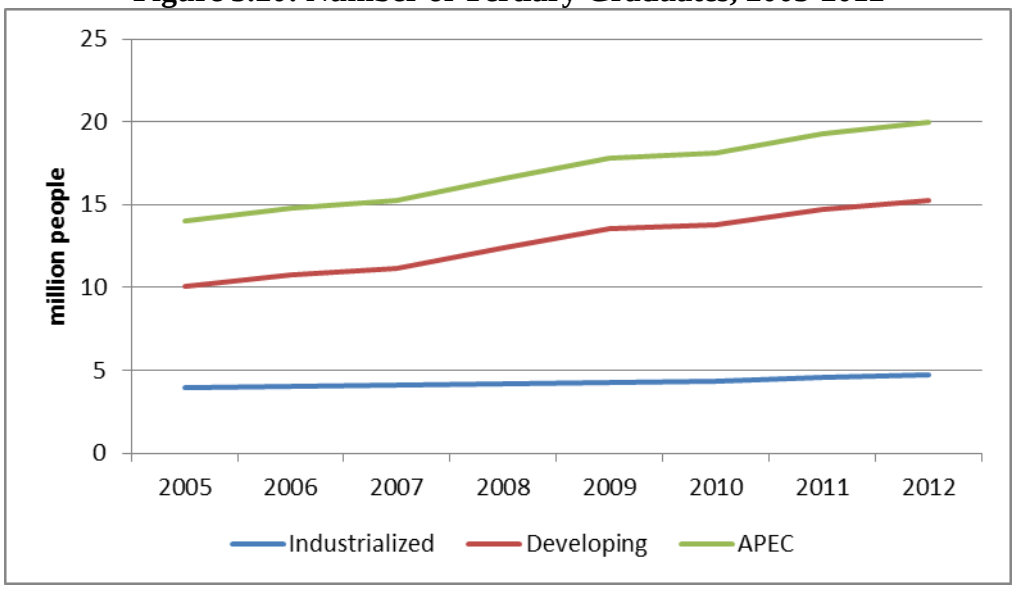
Hong Kong, China	101.0	93.5	88.7	81.4
Indonesia	109.0	92.2	82.5	76.1
Japan	102.0	99.9	102.0	99.1
Korea	103.0	99.1	97.2	96.0
Malaysia	101.0	97.0	70.8	66.3
Mexico	105.0	96.3	85.7	67.9
New Zealand	98.7	98.4	120.0	97.0
Papua New Guinea	114.0	85.6	40.2	n.a.
Peru	99.6	93.7	89.8	77.1
Philippines	106.0	88.2	84.6	61.4
Russia	101.0	96.2	95.3	61.4
Singapore	101.9	100.0	107.1	98.8
Chinese Taipei	99.5	97.7	100.2	95.7
Thailand	92.8	95.6	87.0	79.5
United States	98.1	91.8	93.7	86.9
Viet Nam	105.0	98.1	n.a.	n.a.

Source: WB World Development Indicators; UIS; Ministry of Education, Singapore; and Chinese Taipei Ministry of Education

At the secondary school level, we can see more divergence in opportunities for schooling in APEC economies in comparison to primary school levels. Eight economies have GERs near 100 percent and NERs above 90 percent in secondary school, which indicates that opportunities for secondary education are available to most children. However, secondary enrolment rates in the other economies—with low GERs and even lower NERs—are indicative of relative deprivation in schooling. This is most acute in developing economies with a high incidence of poverty as many households may find it too costly to continue sending their children to school, while insufficient income incentivises households to make children work and earn a living in low-skilled informal work. As such, policy interventions at the economy level and regional cooperation in support of basic education may be needed to ensure that even poorer children will have the opportunity to continue their studies and acquire basic skills.

Rising incomes in APEC economies, on the other hand, are providing greater opportunities to access tertiary education. Figure 3.20 shows the steady rise in the number of tertiary education graduates in the APEC region, particularly in developing economies. Between 2005 and 2012, the number of tertiary graduates grew an average rate of 2.9 percent in industrialized economies, while in developing economies the average annual growth rate was 7.3 percent. Developing economies have been able to expand tertiary education opportunities in general. Improving the access to higher level education is a crucial ingredient in promoting inclusive growth by providing skills to improve the productivity of workers.

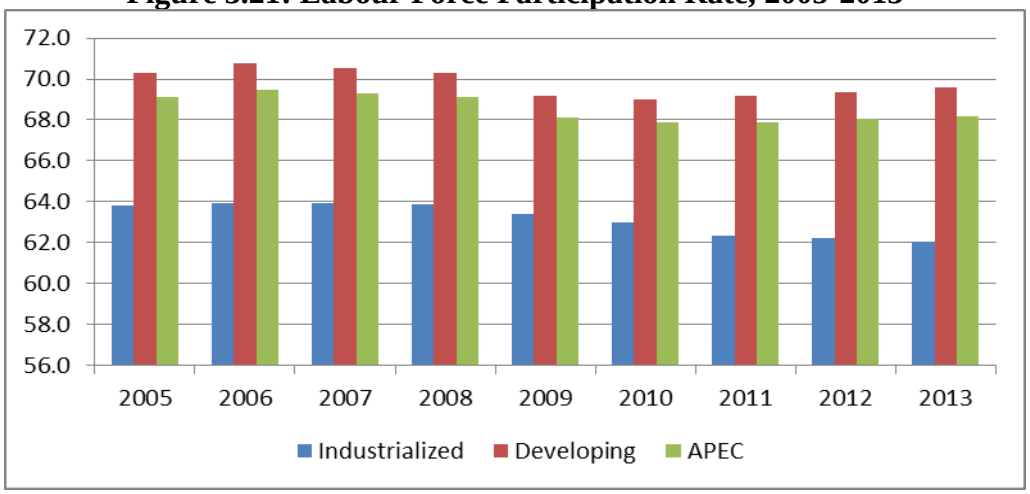
Figure 3.20: Number of Tertiary Graduates, 2005-2012



Note: Data not available for Canada; Papua New Guinea; Peru; and Singapore.
Source: UNESCO and Chinese Taipei Ministry of Education.

In the APEC region, the labour force participation rate (LFPR)—defined as the proportion of adults above 15 years old who are either employed or looking for work—has experienced a slight reduction over 2005-2013 (Figure 3.21). For industrialized economies, the LFPR fell from 63.8 percent in 2005 to 62.0 percent in 2013. For developing economies, the reduction was slighter: from 70.3 to 69.6 percent during the same period. While long-term LFPR trends are the result of preferences or overall economic development[71], short-term changes in the LFPR are often indicators of lack of employment opportunities. In this case, the reduction in LFPR is indicative of the reduction of job opportunities in the aftermath of the global financial crisis, resulting in working-age adults opting out of the labour market and instead pursuing schooling or early retirement. This reduction in job opportunities is also reflected in the region's unemployment rate during the period.

Figure 3.21: Labour Force Participation Rate, 2005-2013

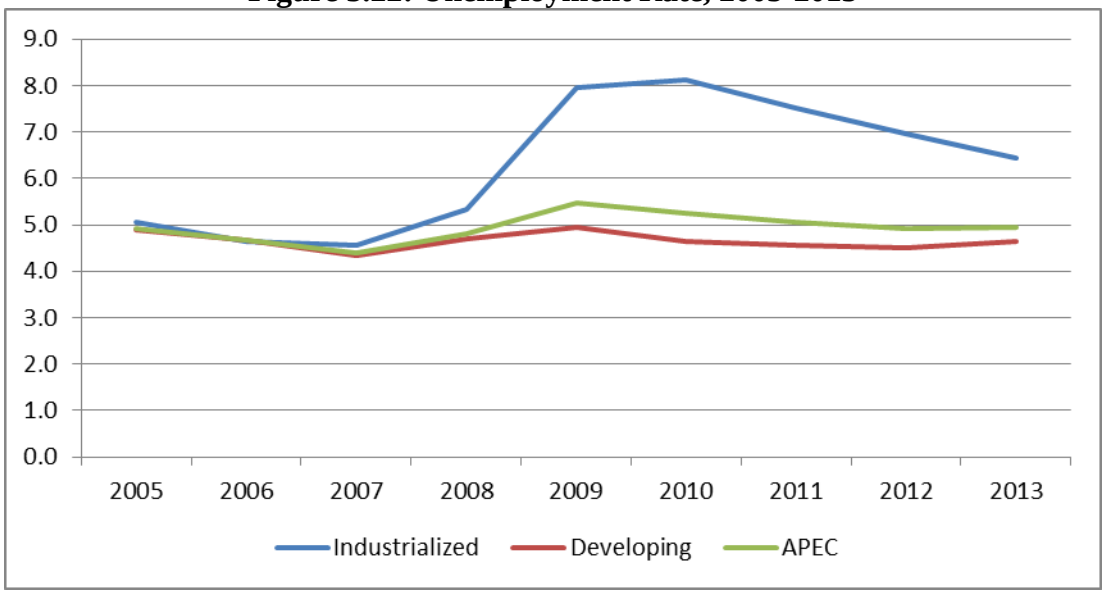


Source: ILO Key Indicators of the Labour Market; Chinese Taipei Directorate-General of Budget, Accounting and Statistics; and APEC Secretariat, Policy Support Unit calculations.

[71] E.g., the LFPR is often higher in developing economies because individuals from poor households cannot afford to not be in the labour market.

Unemployment in the APEC region increased sharply in the aftermath of the global financial crisis in 2008, particularly among industrialized economies (Figure 3.22). Between 2008 and 2009, unemployment in industrialized APEC economies increased from 5.3 to 8.0 percent, but it has since gone down to 6.4 percent in 2013. Developing economies also experienced a temporary increase in unemployment between 2008 and 2009—from 4.7 to 5.0 percent. By 2013, unemployment went back to the same level experienced in 2008.

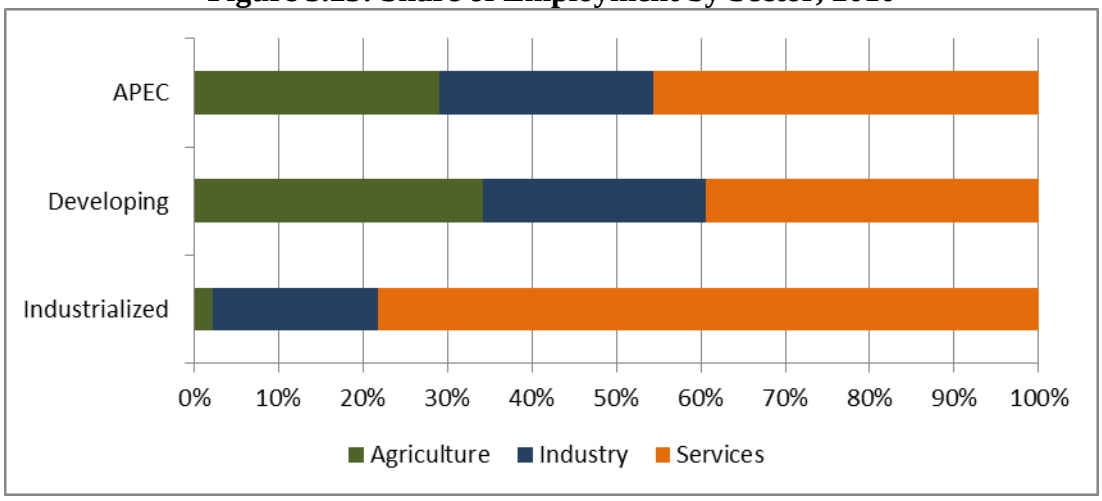
Figure 3.22: Unemployment Rate, 2005-2013



Source: ILO Key Indicators of the Labour Market; Chinese Taipei Directorate-General of Budget, Accounting and Statistics; and APEC Secretariat, Policy Support Unit calculations.

The share of employment by sector reflects the structure of APEC members' economies. As capital intensity increases in the agricultural and industrial sectors due to technological improvements, workers will move away from the agricultural and industrial sector towards the services sector. Indeed, the agricultural sector employed 2.3 percent of workers in industrialized economies, while in developing economies this sector employed 34.2 percent of workers (Figure 3.23). On the other hand, the service sector employed 77.6 percent of workers in industrialized economies, compared to 39.4 percent in developing economies. The industrial sector employed 19.4 percent of workers in industrialized economies and 26.4 percent in developing economies. These data show the importance of developing the services sector, particularly in higher-value and skill-intensive services, to provide employment for workers in the future.

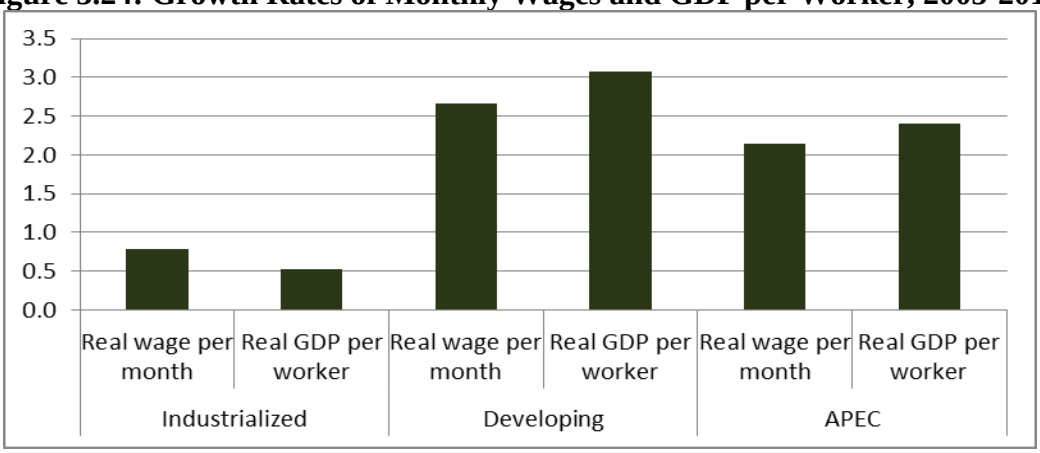
Figure 3.23: Share of Employment by Sector, 2010



Source: ILO Key Indicators of the Labour Market; Chinese Taipei Directorate-General of Budget, Accounting and Statistics; and APEC Secretariat, Policy Support Unit calculations.

On the whole, growth in real monthly wages was slower than growth in labour productivity as measured in GDP per worker over 2005-2011 (Figure 3.24). On average, real monthly wages grew 2.1 percent per year during the period, compared with 2.4 percent annual growth for output per worker. This could be due to labour market rigidities. While labour market protections are essential to ensure workers' rights and fair wages, they can also make employers more risk averse in hiring and wage-setting behaviour, making wages less responsive to changes in labour productivity. In developing APEC economies, real wages grew annually at a slower rate (2.7 percent) than the real GDP per worker (3.1 percent). On the opposite, in industrialized economies, real wages grew faster (0.8 percent) than real GDP per worker (0.5 percent) in the seven years covering 2005-2011.

Figure 3.24: Growth Rates of Monthly Wages and GDP per Worker, 2005-2011



Note: Data do not include Brunei Darussalam and Papua New Guinea.
Source: ILO Key Indicators of the Labour Market and APEC Secretariat, Policy Support Unit calculations.

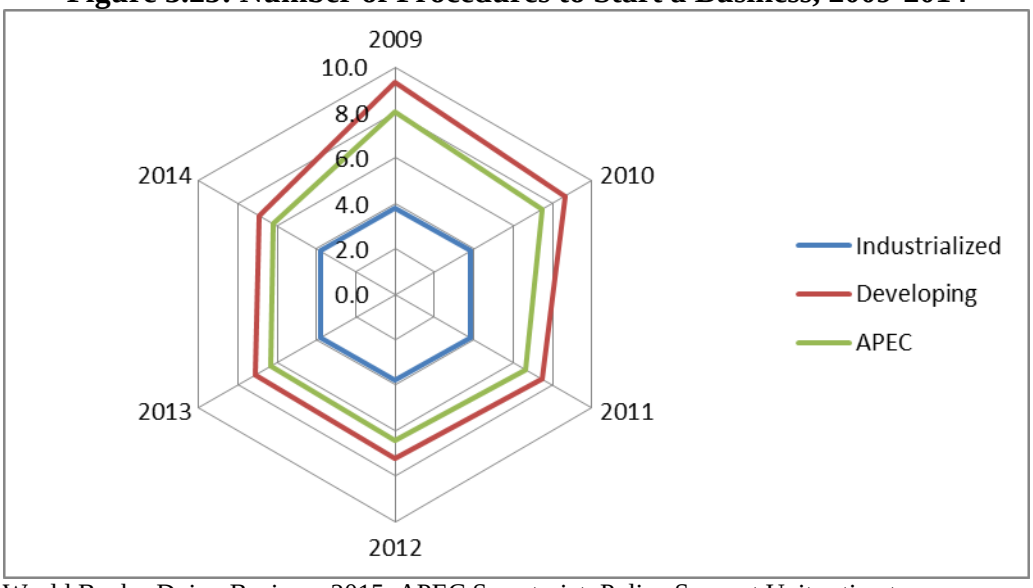
3.3.2 Entrepreneurship Development

Enhancing entrepreneurial activity not only encourages innovation which spurs economic growth, but also promotes inclusive growth by giving people more economic opportunities. Promoting entrepreneurship will require a reduction in the costs of setting up a business as well as the easing of administrative burdens on new business owners. Making the environment more friendly for businesses can provide incentives to reduce informality and expand the access to

property rights and social protection; encourage people to test innovations in the market; and give economic opportunities to anyone embarking into new ventures.

Starting a business remains more cumbersome in developing economies than industrialized economies. On average, it takes 3.8 procedures to start a business in industrialized APEC economies (Figure 3.25). In comparison, it takes 6.9 procedures in developing economies, although this is already down from 9.3 procedures in 2010. According to the World Bank's Doing Business indicators, the number of procedures requested by APEC economies to start a business ranged from 1 to 16. Canada and New Zealand were the APEC economies with best performance, requiring just one procedure to start a business.

Figure 3.25: Number of Procedures to Start a Business, 2009-2014

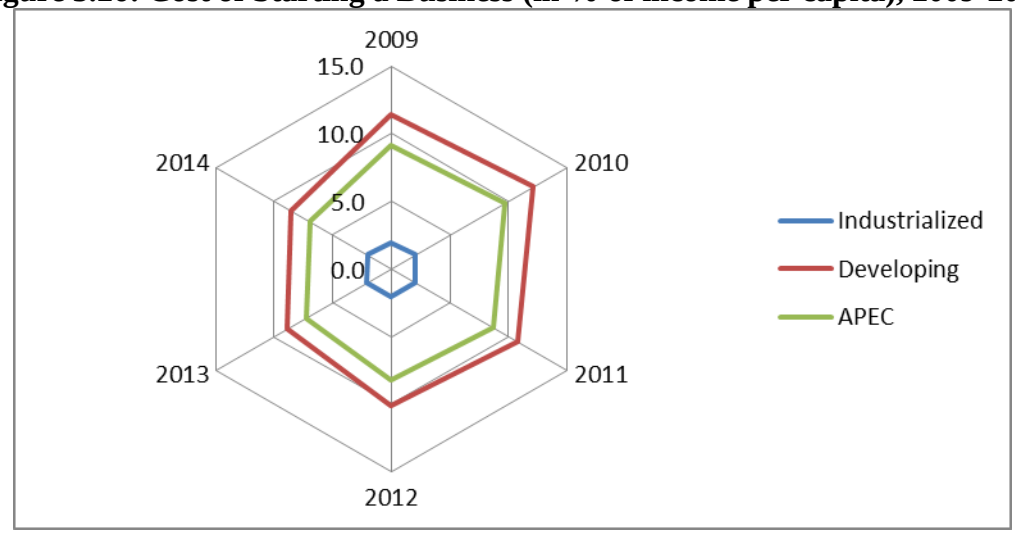


Source: World Bank - Doing Business 2015. APEC Secretariat, Policy Support Unit estimates.

The average cost to start a business in APEC relative to per capita GNI went down from 9.1 percent to 7.0 percent between 2009 and 2014. In income per capita terms, it is relatively more costly to start a business in developing economies than industrialized economies.

In relative terms, the cost of setting up a business is four times higher in developing economies than in industrialized economies (Figure 3.26): in 2014, business start-up costs were 8.5 percent of the income per capita in developing economies, compared with 2.1 percent in industrialized economies. While it was relatively least costly to start a business in Canada (0.4 percent), other economies had a much higher cost, reaching levels beyond 20 percent of the income per capita. A similar observation can be seen in terms of paid-in minimum capital requirements: while all industrialized economies and most of developing economies have largely eliminated this requirement to start a business, this requirement was very onerous in one APEC economy, as it was equivalent to 35.5 percent of its income per capita.

Figure 3.26: Cost of Starting a Business (in % of income per capita), 2009-2014



Source: World Bank – Ease of Doing Business data and APEC Secretariat, Policy Support Unit calculations.

Table 3.10: Paid-in Minimum Capital (in % of income per capita), 2009-2014

	2009	2010	2011	2012	2013	2014
Industrialized	0.0	0.0	0.0	0.0	0.0	0.0
Developing	12.9	11.8	10.1	8.4	7.7	2.4
APEC	9.8	9.0	7.7	6.4	5.8	1.9

Source: World Bank – Ease of Doing Business data and APEC Secretariat, Policy Support Unit calculations.

Between 2005-2006 and 2013-2014, 11 APEC economies have experienced an increase in their nascent entrepreneurial rate, or the proportion of adults 18-64 who are setting up a new business (Table 3.11). Large increases in this rate are seen in two Latin American economies—Chile and Mexico—while another economy from the region—Peru—saw a decrease in nascent entrepreneurial rate although it still retains the highest rate of all APEC economies.

Table 3.11: Nascent Entrepreneurial Rate, 2005-2014

	2005-2006	2009-2011	2013-2014
Australia	6.0	3.9	7.7
Brunei Darussalam	n.a.	n.a.	n.a.
Canada	6.5	n.a.	7.9
Chile	6.0	11.4	16.6
China	5.6	4.9	5.5
Hong Kong, China	n.a.	1.6	n.a.
Indonesia	9.6	n.a.	4.4
Japan	1.1	1.5	2.7
Korea	n.a.	1.8	2.7
Malaysia	4.9	1.4	1.4
Mexico	4.6	9.2	12.7
New Zealand	9.4	n.a.	n.a.
Papua New Guinea	n.a.	n.a.	n.a.
Peru	30.0	22.4	23.1

	2005-2006	2009-2011	2013-2014
Philippines	4.9	n.a.	8.2
Russia	3.4	2.2	2.4
Singapore	3.9	n.a.	6.4
Chinese Taipei	n.a.	4.7	4.4
Thailand	9.7	n.a.	7.6
United States	8.8	4.9	9.7
Viet Nam	n.a.	n.a.	2.0

Source: Global Entrepreneurship Monitor.

The total entrepreneurial activity rate—defined as the proportion of adults 18-64 years old who are a nascent entrepreneur or owner-manager of a new business (i.e., no more than 42 months old)—increased in 12 APEC economies between 2005-2006 and 2013-2014 (Table 3.12). As before, Chile and Mexico showed the largest increases in total entrepreneurial activity during the period. On the other hand, five economies had a reduction in this rate during the period, with Peru again exhibiting the largest decrease while still maintaining the highest rate in APEC.

Table 3.12: Total early-stage entrepreneurial activity rate, 2005-2014

	2005-2006	2009-2011	2013-2014
Australia	10.5	7.8	13.1
Brunei Darussalam	n.a.	n.a.	n.a.
Canada	9.3	n.a.	13.0
Chile	11.1	16.8	26.8
China	13.7	14.4	15.5
Hong Kong, China	n.a.	3.6	n.a.
Indonesia	19.3	n.a.	14.2
Japan	2.2	3.3	3.8
Korea	n.a.	6.6	6.9
Malaysia	11.1	5.0	5.9
Mexico	5.9	10.5	19.0
New Zealand	17.6	n.a.	n.a.
Papua New Guinea	n.a.	n.a.	n.a.
Peru	40.1	27.2	28.8
Philippines	20.4	n.a.	18.2
Russia	4.8	3.9	4.7
Singapore	7.2	6.6	11.0
Chinese Taipei	n.a.	8.4	8.5
Thailand	20.7	19.5	23.3
United States	12.4	7.6	13.8
Viet Nam	n.a.	n.a.	15.3

Source: Global Entrepreneurship Monitor.

The entrepreneurship rates reported above reflect both formal and informal entrepreneurship. Hence, these rates include the highly-skilled and innovative entrepreneurs as well as self-employed workers in low-skilled home-based production. High levels of entrepreneurship, while a sign of industriousness and persistence, are therefore not a clear sign of innovation or inclusiveness. A key component missing in entrepreneurship data is the formalisation of

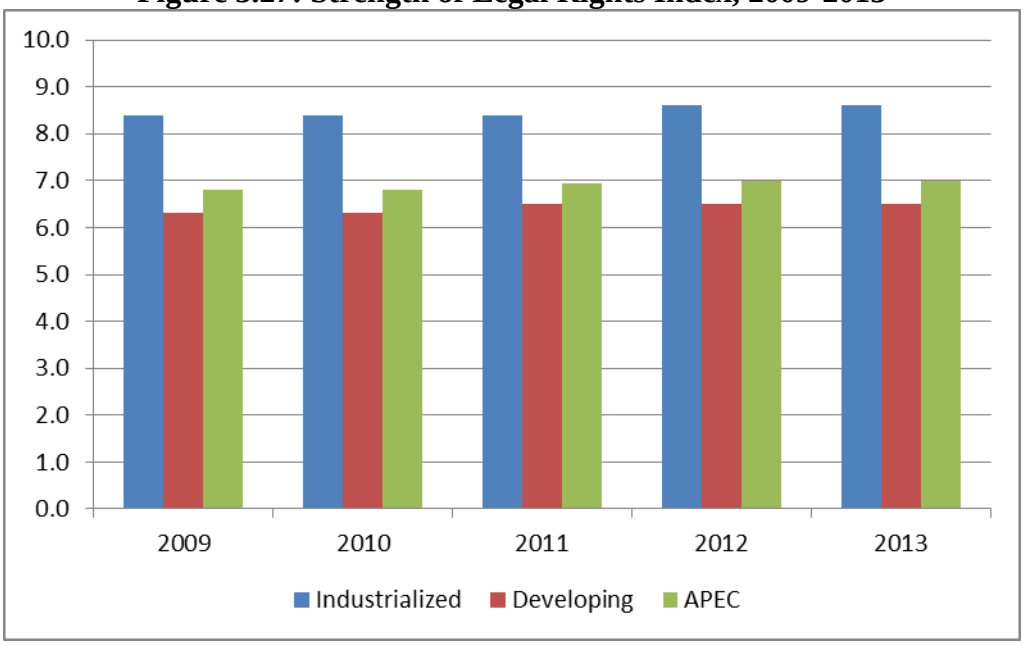
informal entrepreneurship work. Encouraging self- informal entrepreneurs to go into the formal sector—by reducing the time and monetary costs of setting up and maintaining a business—is essential to making growth more inclusive.

3.3.3 Access to Finance and Financial Development

Promoting entrepreneurial activity and SME growth in the formal sector requires the development of adequate access to credit and finance. New businesses need start-up capital to start operations and established businesses need financing to continue operations and expand.

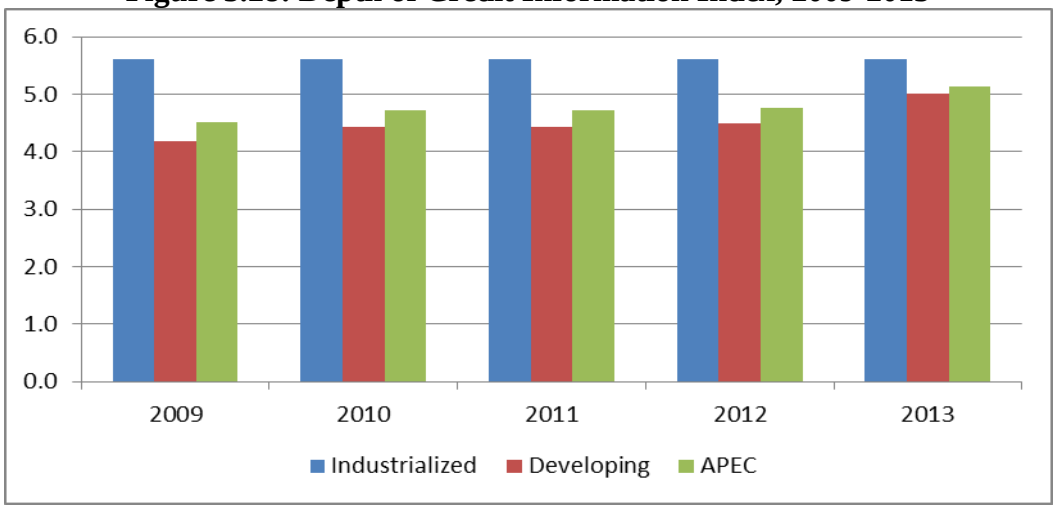
An accessible financial market hinges on having credible protection and information for creditors. Institutions that raise and lend money need to be adequately assured of fair contract enforcement through a proper legal framework. They need to have adequate information in order to make an informed assessment of the risks involved and decide afterwards if requests for credit can be approved or not. As can be seen in Figures 3.27 and 3.28, industrialized APEC economies are performing better than developing economies in laying the groundwork for an accessible financial sector. In both legal protection and availability of credit information, industrialized economies score much higher, on average, than developing economies based on World Bank's Doing Business database.

Figure 3.27: Strength of Legal Rights Index, 2009-2013



Note: Index ranges from 1 (worst) to 10 (best). This index measures (1) the protection of rights of borrowers and lenders through collateral laws and (2) the protection of creditors' rights through bankruptcy laws.
Source: World Bank – Ease of Doing Business data and APEC Secretariat, Policy Support Unit calculations.

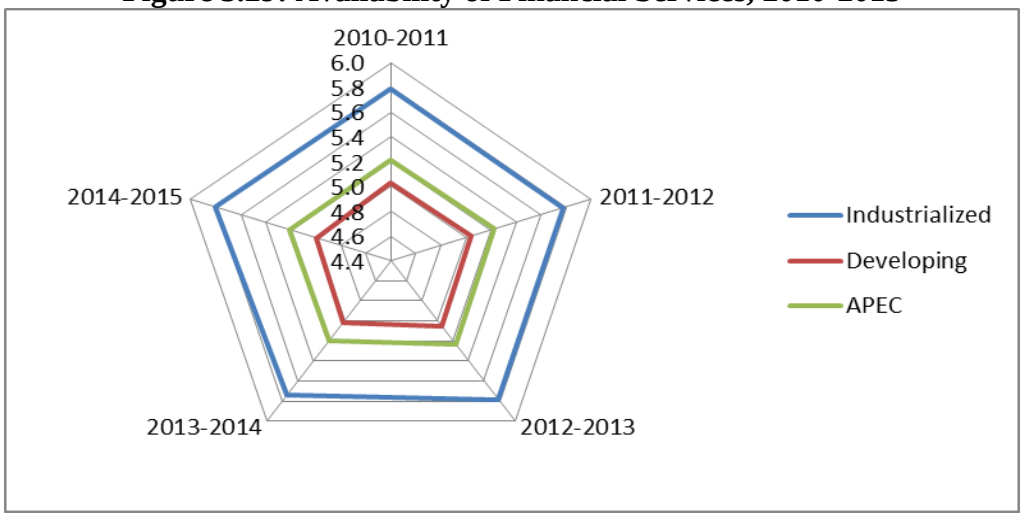
Figure 3.28: Depth of Credit Information Index, 2009-2013



Note: Index ranges from 1 (worst) to 6 (best). This index measures the scope and accessibility of credit information distributed by credit registries and credit bureaus.
Source: World Bank – Ease of Doing Business data and APEC Secretariat, Policy Support Unit calculations.

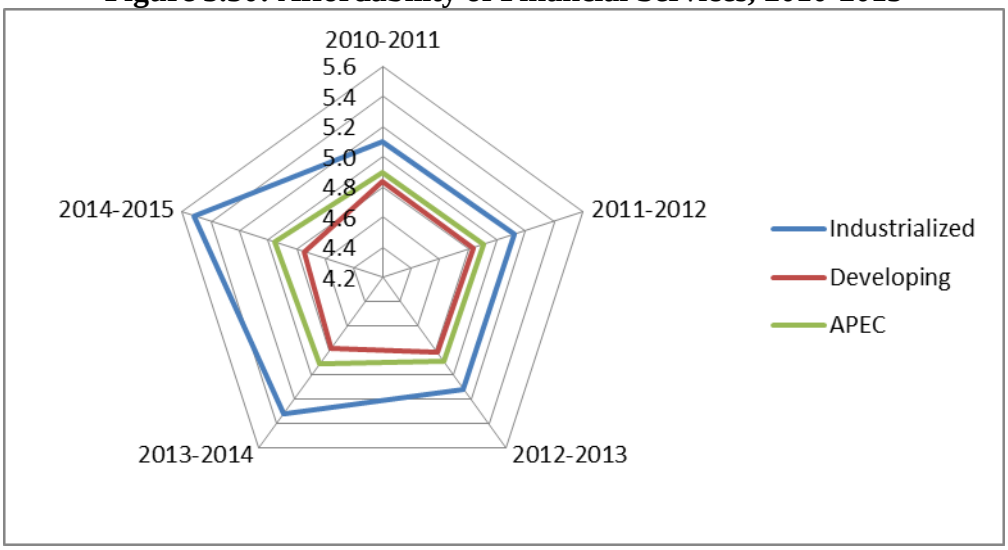
Are financial services more available and affordable in APEC nowadays? According to surveys conducted by the World Economic Forum, industrialized APEC economies score higher than developing economies on availability and affordability of financial services (see Figures 3.29 and 3.30). While scores for availability of financial services have remained practically unchanged in 2010-2015, scores for affordability have improved for industrialized economies during the period. The increase in the affordability of financial services in industrialized economies reflects the impact of quantitative easing in these economies in reducing interest rates (i.e. costs of financing) and encouraging investment. Developing economies also experienced an increase in affordability of financial services, although this was not as pronounced as in industrialized economies.

Figure 3.29: Availability of Financial Services, 2010-2015



Note: Index ranges from 1 (worst) to 7 (best). Scores reflect responses to the question, "In your country, to what extent does the financial sector provide a wide range of financial products and services to businesses? [1 = not at all; 7 = provides a wide variety]"
Source: World Economic Forum data and APEC Secretariat, Policy Support Unit calculations.

Figure 3.30: Affordability of Financial Services, 2010-2015



Note: Index ranges from 1 (worst) to 7 (best). Scores reflect responses to the question, "In your country, to what extent are financial services affordable for businesses? [1 = not affordable at all; 7 = affordable]"
Source: World Economic Forum data and APEC Secretariat, Policy Support Unit calculations.

3.3.4 Social Protection and Safety Nets

Providing social protection to individuals is a key aspect of inclusive growth because it not only provides income support for vulnerable individuals, but it also reduces uncertainty which allows individuals to make longer-term decisions (e.g., invest in skills development or start a business). Hence, beyond providing short-term assistance to needy families, social safety nets can contribute to economic growth by encouraging individuals to invest either in human capital or in entrepreneurial activity.

APEC's performance in providing safety nets to people who are unemployed is mixed. As of 2013, eight developing APEC economies do not provide unemployment protection for workers. Meanwhile, four APEC economies—three industrialized and one developing—have reduced their recipient rate for unemployment protection between 2005 and 2013 (Table 3.13). However, large improvements in the unemployment protection recipient rate were observed in Korea; Thailand; and Viet Nam.

Table 3.13: Recipients of Unemployment Benefits, 2005-2013 (in percent of total unemployed)

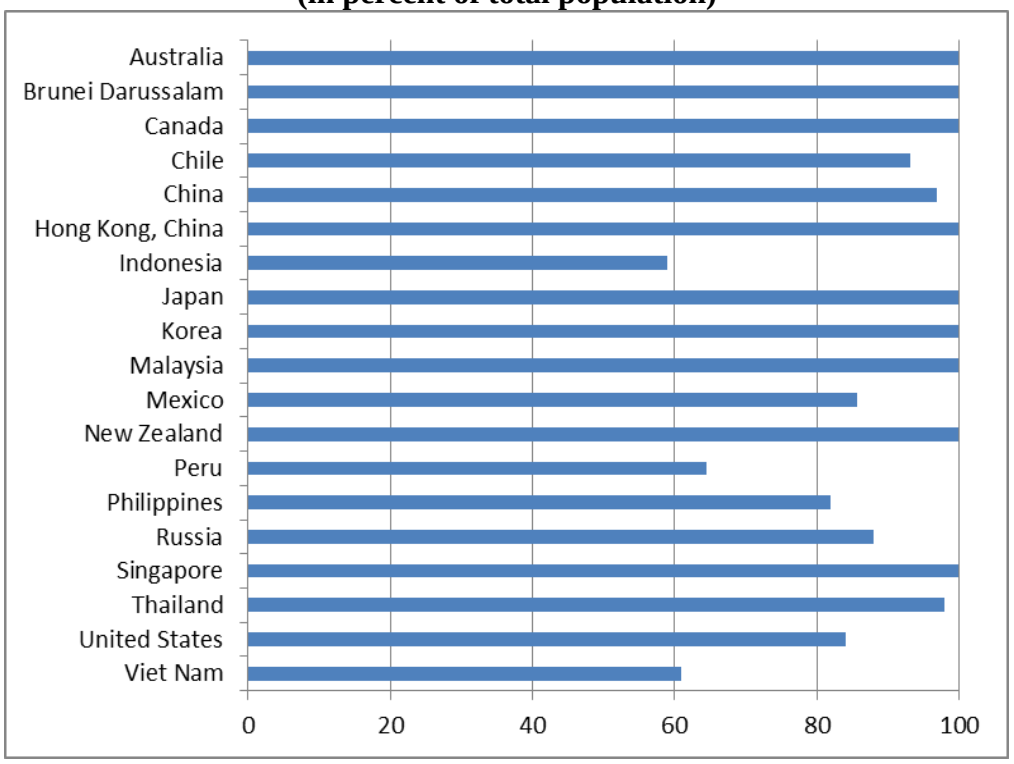
	2005	2008-2009	2012-2013
Australia	70.4	58.2	52.7
Brunei Darussalam	n.a.	0.0	0.0
Canada	44.2	48.4	40.5
Chile	n.a.	19.5	29.9
China	n.a.	14.0	n.a.
Hong Kong, China	n.a.	16.9	n.a.
Indonesia	0.0	0.0	0.0
Japan	21.4	25.4	n.a.
Korea	27.5	39.2	45.5
Malaysia	0.0	0.0	0.0

	2005	2008-2009	2012-2013
Mexico	n.a.	0.0	0.0
New Zealand	n.a.	35.8	32.9
Papua New Guinea	0.0	0.0	0.0
Peru	0.0	0.0	0.0
Philippines	0.0	0.0	0.0
Russia	n.a.	n.a.	20.6
Singapore	0.0	0.0	0.0
Chinese Taipei	32.5	32.7	15.8
Thailand	4.2	24.3	28.5
United States	35.0	40.4	26.5
Viet Nam	0.0	0.7	8.4

Source: ILO Social Protection Indicators

Social protection is also important in healthcare, as serious illnesses can cause catastrophic health payments, loss of income, and continuing healthcare costs. On average, 89.4 percent of the APEC population is covered by some kind of social health protection scheme. This coverage rate is slightly higher in industrialized economies (90.0 percent) than in developing economies (89.3 percent). However, there is a wide disparity in terms of social health coverage across APEC economies (Figure 3.31). According to the ILO's Social Protection Indicators database, three APEC economies have less than 65 percent of their populations covered by social health protection coverage schemes as of 2011.

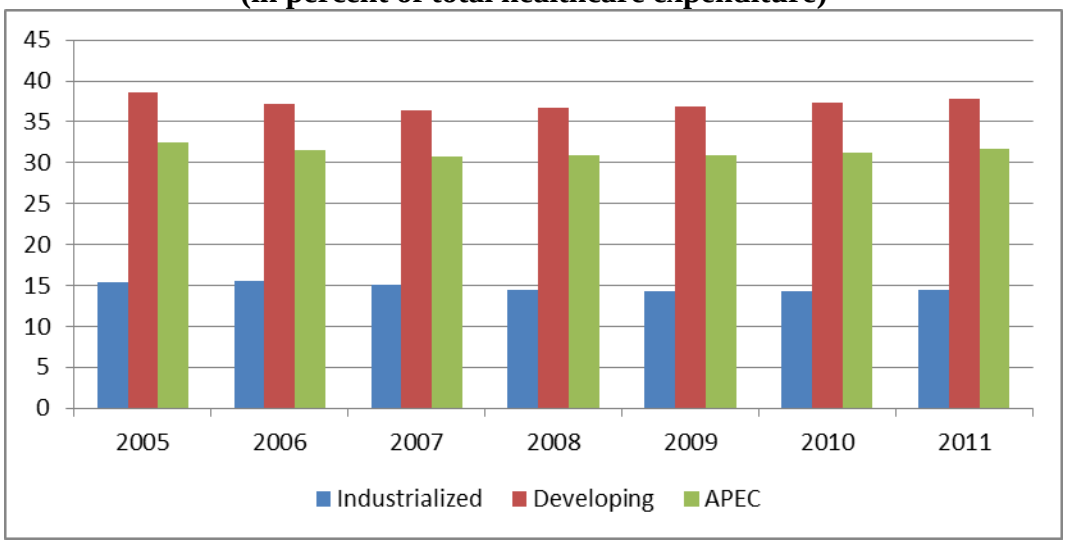
Figure 3.31: Social Health Protection Coverage, 2009-2011
(in percent of total population)



Note: Data for Thailand are for 2007. Data are not available for economies not included in the figure.
Source: ILO Social Protection Indicators

Out-of-pocket expenditures (OPE) for healthcare can be burdensome on households, particularly poor and near-poor households. A higher proportion of OPE in total healthcare expenditure makes households more vulnerable to the economic impacts of serious illnesses and makes it more likely that these will result in catastrophic health payments. Figure 3.32 shows the proportion of OPE in total healthcare expenditure. It can be seen that industrialized economies have a lower proportion of OPE in total healthcare spending, averaging at 14.5% in 2013. On the other hand, on average, more than one-third of total healthcare spending is OPE in developing economies (37.9% in 2013). Considering that most of the region's poor households are in developing economies, the high proportion of OPE in these economies and relatively lower rates of social health protection coverage shows that more can be done to provide social health protection to vulnerable households.

Figure 3.32: Household Out-of-Pocket Healthcare Expenditure, 2005-2011 (in percent of total healthcare expenditure)



Source: ILO Social Protection Indicators

Another vulnerable group is the elderly. As can be seen in Table 3.14, there is a large disparity across APEC economies in the proportion of elderly who are receiving pension payments, ranging from 8.1 percent for Indonesia to 98.0 percent in New Zealand. While retirees are out of the labour market by definition, many of them could have disposable income leftover from their savings during their working years, but the social provision of old-age pension would give elderly more certainty to have a decent life standard by having access to a minimum level of income.

Table 3.14: Recipients of Old-Age Pension (in percent of population above retirement age)

Economy	Rate	Year
Australia	83.0	2010
Brunei Darussalam	87.0	2011
Canada	97.7	2009
Chile	74.5	2012
China	74.4	2011
Hong Kong, China	72.9	2009
Indonesia	8.1	2010
Japan	80.3	2008

Economy	Rate	Year
Korea	77.6	2010
Malaysia	19.8	2010
Mexico	25.2	2009
New Zealand	98.0	2012
Papua New Guinea	n.a.	n.a.
Peru	n.a.	n.a.
Philippines	n.a.	n.a.
Russia	n.a.	n.a.
Singapore	n.a.	n.a.
Chinese Taipei	n.a.	n.a.
Thailand	81.7	2010
United States	92.5	2011
Viet Nam	34.5	2010

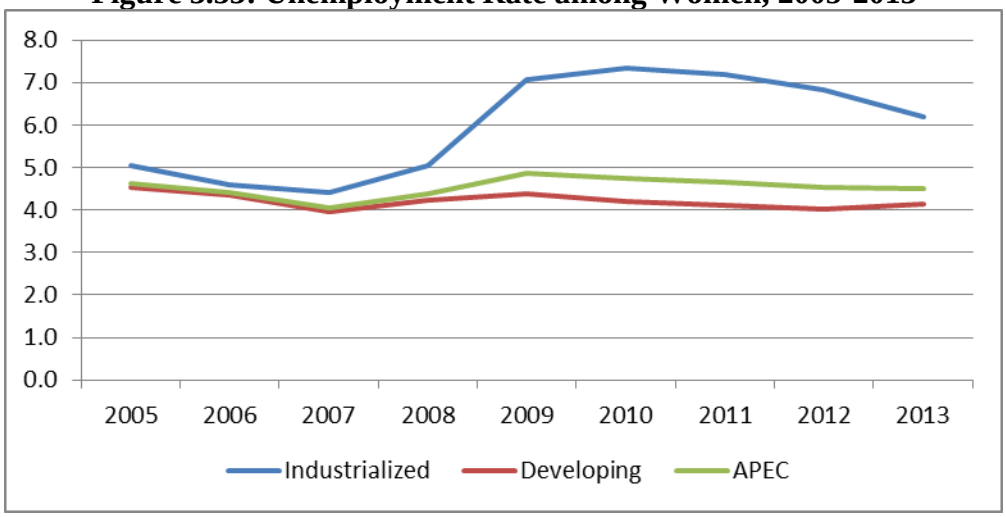
Source: ILO Social Protection Indicators

3.3.5 Economic Opportunities for Disadvantaged Groups

An important goal of inclusive growth is to provide economic opportunities for disadvantaged groups such as women, youth, elderly, ethnic minorities, people living with disabilities, and other vulnerable populations. Among these groups, women and the youth are the largest in terms of population.

Based on ILO data, women's participation in the labour force have remained largely constant between 2005 and 2013, with about 55 percent of women in industrialized economies and 60% in developing economies being economically active. Unemployment among women in APEC economies increased sharply in the aftermath of the global financial crisis in 2008, reaching a peak of 4.9 percent in 2009 (Figure 3.33). The increase in women's unemployment was most acute in industrialized economies, where unemployment rose from 4.4 percent in 2007 and peaked at 7.3 percent in 2010 before going down to 6.2 percent in 2013. Meanwhile, women's unemployment in developing economies remained between 4.0 percent and 4.5 percent during 2005-2013.

Figure 3.33: Unemployment Rate among Women, 2005-2013



Source: ILO Key Indicators of the Labour Market data and APEC Secretariat, Policy Support Unit calculations.

Women are more likely to be engaged in wage or salary work in 10 APEC economies for which there are data, while the men are more likely to be wage/salary workers in eight economies (Table 3.15). As wage and salary work is often considered secure employment (i.e., with reasonable job security and labour rights protection), these data show that, in general, women in APEC are just as likely as men to access secure jobs.

Table 3.15: Wage and Salary Employment (in percent of total employed persons)

	Men	Women
Australia	86.7	91.4
Brunei Darussalam	n.a.	n.a.
Canada	90.1	92.0
Chile	72.7	62.2
China	n.a.	n.a.
Hong Kong, China	85.6	94.4
Indonesia	38.5	33.0
Japan	87.1	88.7
Korea	70.4	73.6
Malaysia	73.4	74.6
Mexico	66.9	65.2
New Zealand	79.8	87.5
Papua New Guinea	n.a.	n.a.
Peru	50.5	43.6
Philippines	52.9	51.4
Russia	92.1	93.3
Singapore	81.5	89.5
Chinese Taipei	74.1	81.2
Thailand	42.0	40.7
United States	99.1	94.5
Viet Nam	39.9	29.4

Note: Data shown is latest available and covers the period 2008-2013.
Source: ILO Key Indicators for the Labour Market

On the other hand, contributing family work includes paid or unpaid employment in family enterprises such as agricultural production or backyard production, but excludes domestic work. It is often informal, does not have any of the protections of regular employment, and is an insecure form of employment. In 15 APEC economies, women are more likely than men to be employed as contributing family workers, while the likelihood is the same in the remaining three economies (Table 3.16). This shows that women continue to be more likely than men to be employed in the most insecure of jobs.

Table 3.16: Employment as contributing family worker (in percent of total employed persons)

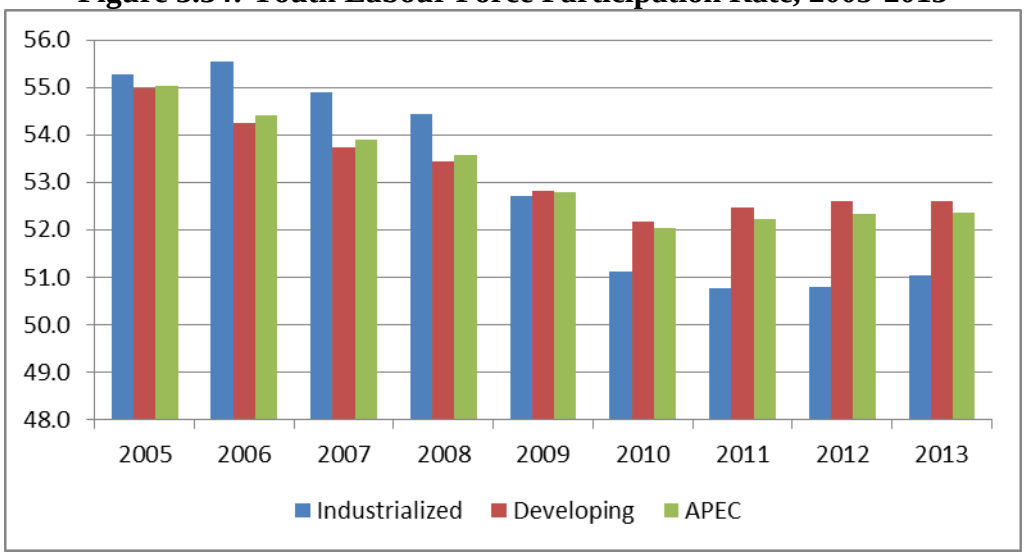
	Men	Women
Australia	0.2	0.3
Brunei Darussalam	n.a.	n.a.
Canada	0.1	0.1

	Men	Women
Chile	0.9	2.2
China	n.a.	n.a.
Hong Kong, China	0.1	0.8
Indonesia	6.9	30.9
Japan	1.0	5.6
Korea	1.2	10.7
Malaysia	2.5	8.4
Mexico	4.3	9.1
New Zealand	0.7	1.3
Papua New Guinea	n.a.	n.a.
Peru	6.5	18.1
Philippines	9.0	17.4
Russia	0.1	0.1
Singapore	0.3	0.8
Chinese Taipei	2.5	9.5
Thailand	16.1	30.4
United States	0.1	0.1
Viet Nam	12.0	22.6

Note: Data shown is latest available and covers the period 2008-2013.
Source: ILO Key Indicators for the Labour Market

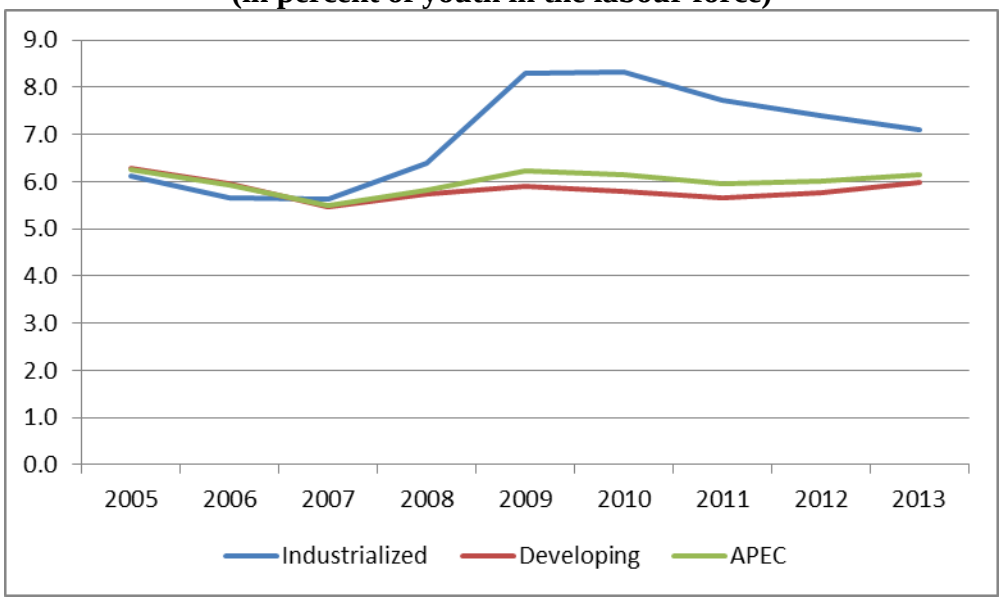
Labour force participation among the youth—i.e., those who are 15-24 years old—fell in the aftermath of the global financial crisis, especially in industrialized economies. As can be seen in Figure 3.34, the youth labour force participation rates were initially higher in APEC industrialized economies than developing economies, but the opposite is true starting in 2009. This indicates that the global financial crisis closed many employment opportunities for the youth, in particular in industrialized economies, who then opted to either return to schooling or simply stop looking for work. Indeed, Figure 3.35 shows a spike in the youth unemployment rate following the global financial crisis especially in industrialized economies.

Figure 3.34: Youth Labour Force Participation Rate, 2005-2013



Source: ILO Key Indicators for the Labour Market and APEC Secretariat, Policy Support Unit calculations.

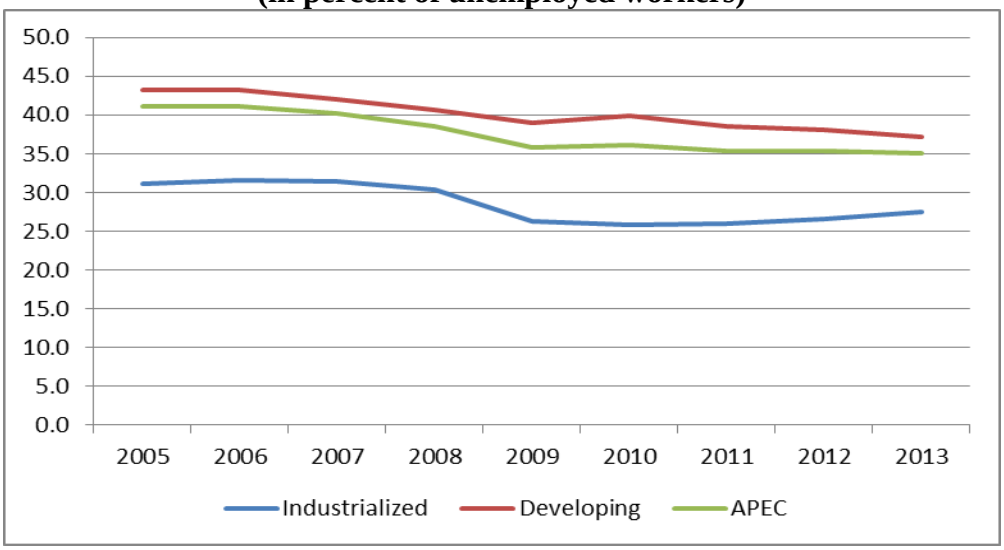
Figure 3.35: Youth Unemployment Rate, 2005-2013
(in percent of youth in the labour force)



Source: ILO Key Indicators for the Labour Market and APEC Secretariat, Policy Support Unit calculations.

The proportion of youth in total unemployment, however, continues to be higher in developing economies than industrialized economies (Figure 3.36). As of 2013, 27.5% of unemployed workers in industrialized economies are youth, while in developing economies this rate is 37.2%. However, the share of youth in unemployment is going down in developing economies, pointing to improved labour market opportunities for young workers in recent years.

Figure 3.36: Share of Youth in Total Unemployment, 2005-2013
(in percent of unemployed workers)



Source: ILO Key Indicators for the Labour Market and APEC Secretariat, Policy Support Unit calculations.

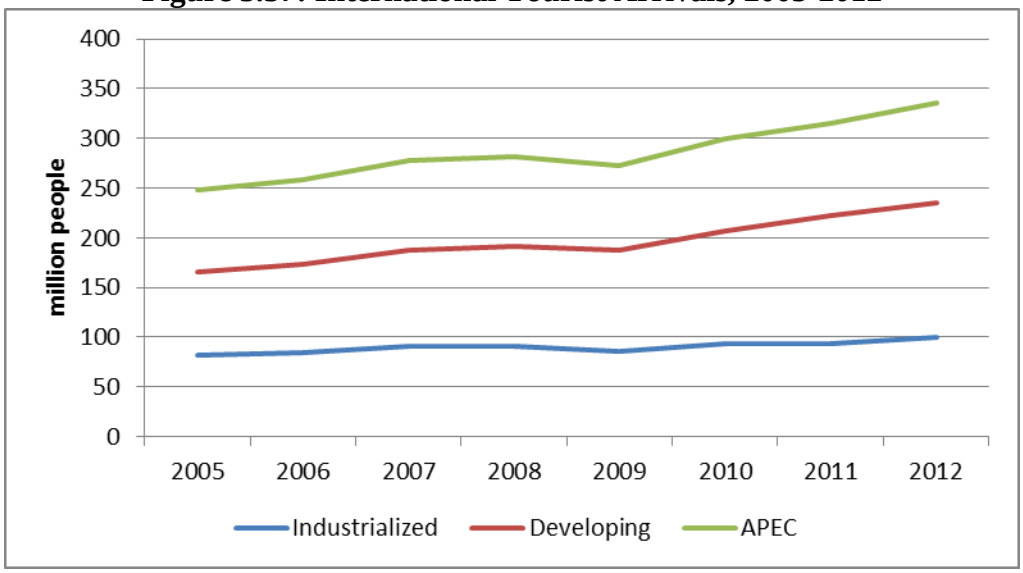
3.3.6 Tourism Development and Promotion

Promoting tourism is a key policy response to spur inclusive growth because of the tourism industry's potential to encourage investment and entrepreneurial activity. Increased tourism can lead to higher profits for the transportation, hospitality, restaurant, and other service sectors, which can lead to business expansion and further employment opportunities.

Moreover, increased tourism can encourage households to engage in microenterprises such as food processing, handicrafts, or services, enabling even poorer households to participate in the growing tourist market.

International tourist arrivals have been on an upward trend in 2005-2012 (Figure 3.37). During this period, tourist arrivals in APEC have grown at an average of 5.1 percent per year. In industrialized economies, the annual average growth rate in tourism arrivals is 3.1 percent, while in developing economies it is 6.1 percent.

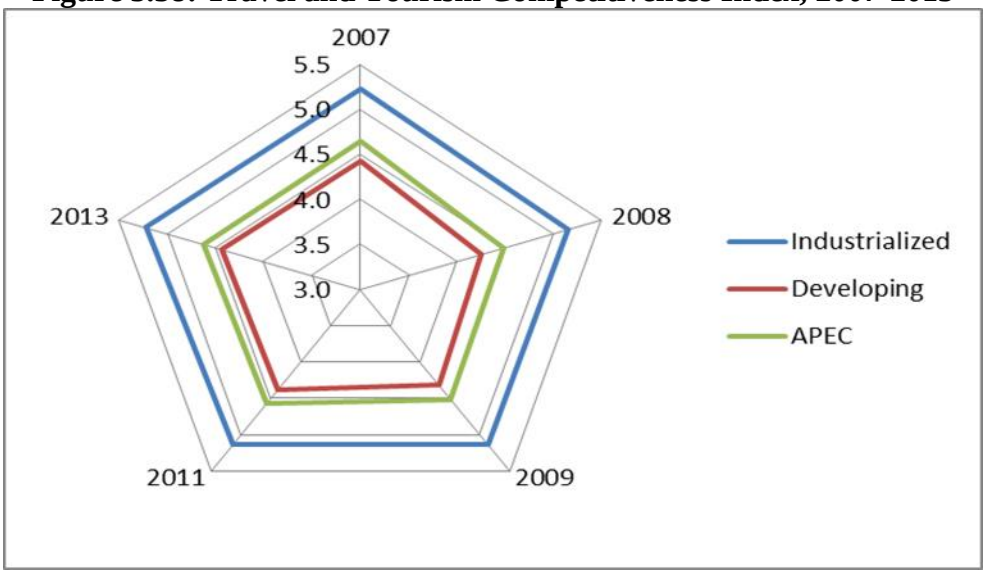
Figure 3.37: International Tourist Arrivals, 2005-2012



Source: World Bank World Development Indicators, Chinese Taipei Ministry of Transportation and Communications, and APEC Secretariat, Policy Support Unit calculations.

There is potential for tourism to grow in APEC. As can be seen in Figure 3.38, developing economies still score lower than industrialized economies in the World Economic Forum's Travel and Tourism Competitiveness Index, which mainly covers factors such as policy rules and regulations, infrastructure, environmental sustainability, safety and security and human resources, among others. This index shows that developing APEC economies have further space to develop tourism through destination promotion and improvements in connectivity (e.g., infrastructure development, opening of air routes, or entry facilitation).

Figure 3.38: Travel and Tourism Competitiveness Index, 2007-2013



Note: Index scores range from 1 to 7 (best). The index considers the following factors: 1. Policy rules and regulations; 2. Environmental sustainability; 3. Safety and security; 4. Health and hygiene; 5. Prioritization of Travel & Tourism; 6. Air transport infrastructure; 7. Ground transport infrastructure; 8. Tourism infrastructure; 9. ICT infrastructure; 10. Price competitiveness in the T&T industry; 11. Human resources; 12. Affinity for Travel & Tourism; 13. Natural resources; and 14. Cultural resources.
Source: World Economic Forum and APEC Secretariat, Policy Support Unit calculations.

3.4 SUSTAINABLE (GREEN) GROWTH

One of the growth attributes identified by APEC is about sustainable growth, which emphasizes on the protection of the environment and the transition to become green economies. The concept of sustainable growth, according to the APEC Growth Strategy, covers a broad range of issues from energy efficiency and low-carbon society to trade facilitation of environmental goods and services.

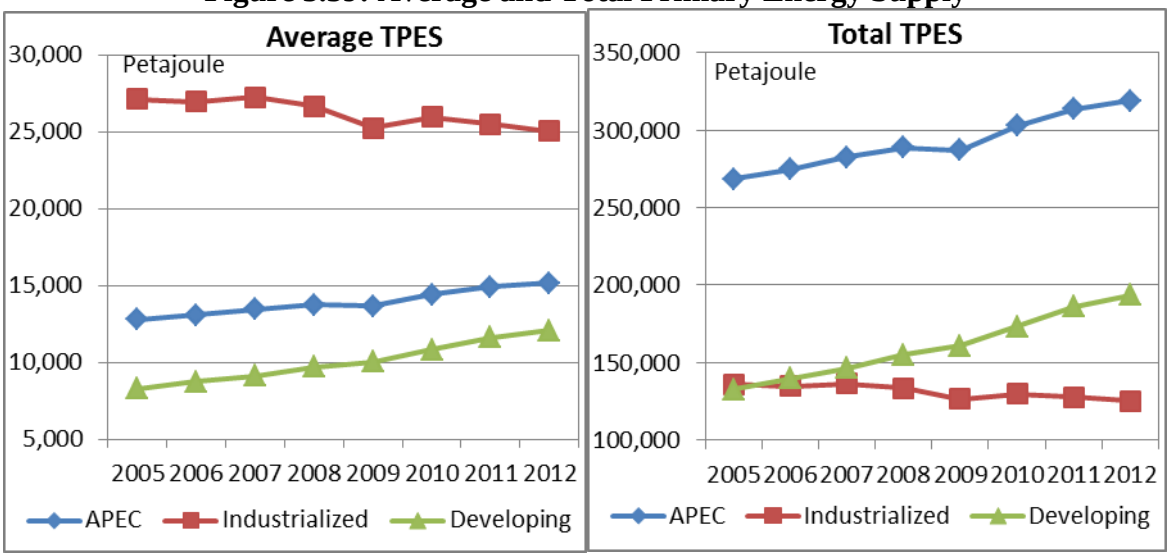
3.4.1 Enhancing Energy Efficiency and Security

Energy has always been an important backbone in driving economic growth and it is becoming a critical issue due to pressure on meeting mounting energy demands while at the same time minimizing negative environmental impacts. This dilemma poses challenges especially for developing economies – who are seeking cheap energy sources while tackling associated environmental problems.

Primary Energy Supply

From 2005 to 2012, the total primary energy supply (TPES) of APEC economies grew at an annualized rate of 2.5 percent. The growth was led by APEC-developing economies, whose average TPES grew at 5.6 percent per annum as shown in Figure 3.39. Meanwhile, average TPES of APEC-industrialized economies has decreased 1.1 percent per annum.

Figure 3.39: Average and Total Primary Energy Supply



Source: APEC Energy Database, IEEJ and APEC Secretariat, Policy Support Unit calculations.

Notably, China has been the single largest positive contributor to the higher TPES given its vast and increasing share of TPES within APEC. China accounted for 24 percent of the total APEC TPES in 2005 and 35 percent in 2012 (Table 3.17).

Table 3.17: Top 5 Total Primary Energy Supply Producers in APEC (Share within APEC)

2005		2012	
United States	37.2	China	35.0
China	22.5	United States	28.2
Russia	10.4	Russia	9.9
Japan	8.3	Japan	5.9
Canada	4.3	Korea	3.5

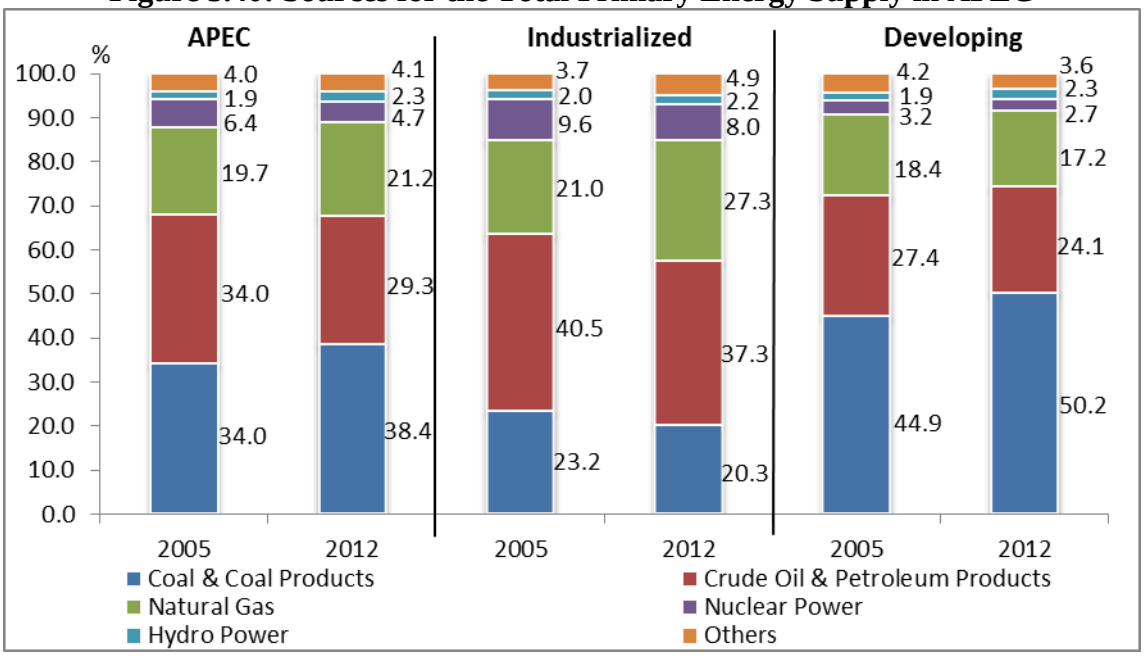
Source: APEC Energy Database, IEEJ and APEC Secretariat, Policy Support Unit estimates

Figure 3.40 showed the composition of TPES by source. For APEC economies, coal and its related products remained the largest source of energy supply and their proportion of TPES has increased gradually from 34 percent in 2005 to 38.4 percent in 2012. This upward trend was largely due to increasing use of coal in APEC-developing economies - the percentage of TPES from coal and coal products rose from 44.9 percent in 2005 to 50.2 percent in 2012. Use of natural gas has picked up and this could be considered as an improvement since natural gas emits less carbon dioxide than coal and could be seen as a "bridge" fuel from traditional to renewable sources.[72] However, signs that APEC economies have started to use cleaner energy have been largely missing with decreasing shares of nuclear, hydro power and other sources in TPES[73] from 2005 to 2012.

[72] See http://www.eia.gov/environment/emissions/co2_vol_mass.cfm. A recent study published in the journal Nature in October 2014 mentioned that several studies concluded that natural gas as a substitute for coal could reduce CO2 emissions. However, if there is a massive increase in the use of natural gas, the impact on CO2 will be much smaller and the majority of its estimations show that this will not be an effective tool for climate change mitigation as climate temperature may increase. See http://www.nature.com/nature/journal/v514/n7523/full/nature13837.html.

[73] Other sources include geothermal power, wind, tide, photovoltaic power and biomass.

Figure 3.40: Sources for the Total Primary Energy Supply in APEC



Source: APEC Energy Database, IEEJ and APEC Secretariat, Policy Support Unit calculations.

For APEC-industrialized economies, the decreasing usage of coal and oil to generate energy has been evident due to the increasing use of natural gas. This trend has been consistent among all APEC-industrialized economies, with the exception of Japan, which reported more energy generated from coal and oil due to its plunge in nuclear-sourced energy after the 2011 earthquake in Fukushima. Japan generated 14.6 percent of energy from nuclear power in 2005 and this figure plummeted to 1 percent in 2012[74]. In contrast, other APEC-industrialized economies with reported data on nuclear energy generation, namely Canada and the United States, posted slightly higher shares of energy generated by nuclear power over the period 2005-2012.

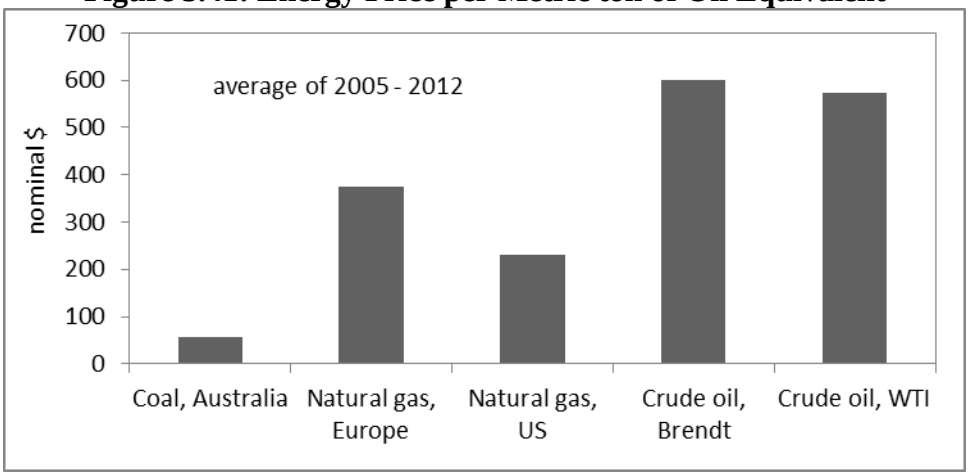
However, for APEC-developing economies, the share of coal in primary energy generation has climbed at the expense of falling shares in other sources, except for hydro power. This could be explained by the fact that APEC-developing economies have lower costs of producing coal compared to their industrialized counterparts.[75] China accounted for more than half of the TPES generated from coal in the APEC region.

Despite the fact that a number of APEC-developing economies are well-endowed with oil and gas resources, this has not induced them to switch away from coal to oil in energy generation. One potential explanation could be the cost. As shown in Figure 3.41, coal has been a much cheaper option.

[74] U.S. Energy Information Administration's International Energy Statistics and BP Statistical Review of World Energy 2014. See http://www.eia.gov/beta/international/analysis.cfm?iso=JPN

[75] APEC-developing economies on average have higher coal rents, as measured by percentage of GDP, compared to APEC-industrialized economies during 2005 to 2012. Coal rents are defined as the difference between the value of coal at world prices and their total cost of production in the economy.

Figure 3.41: Energy Price per Metric ton of Oil Equivalent

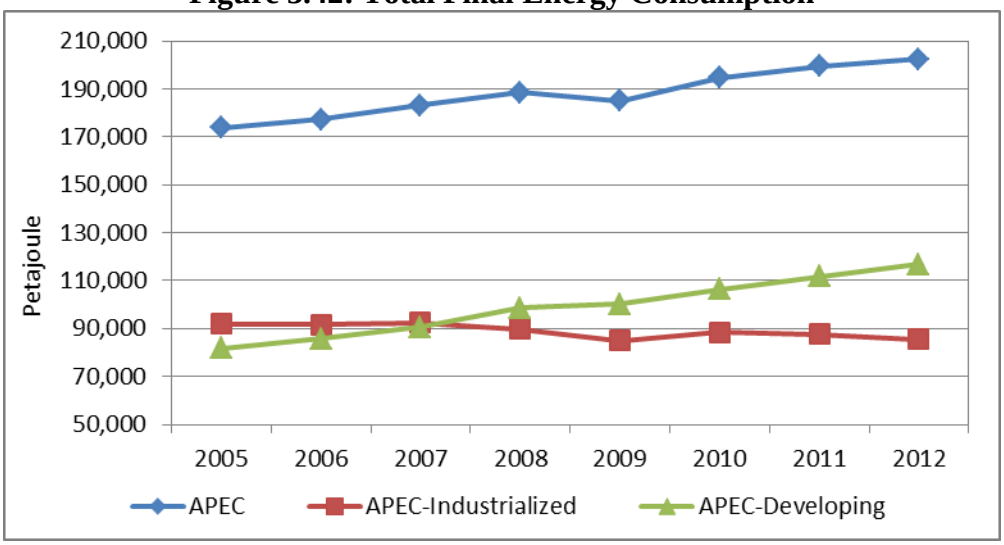


Source: World Bank, BP Statistical Review of World Energy, EIA and APEC Secretariat, Policy Support Unit calculations

Final Energy Consumption and Electricity Power Generation

From the demand perspective, the total final energy consumption (TFEC) grew at an annualized rate of 2.2 percent per annum during 2005 to 2012 for economies in the APEC region (Figure 3.42). Year-on-year growth rate peaked at 2010 with 5.2 percent but has slowed down after that to 2.4 percent in 2011 and further to 1.5 percent in 2012.

Figure 3.42: Total Final Energy Consumption



Source: APEC Energy Database, IEEJ and APEC Secretariat, Policy Support Unit calculations

China emerged as the biggest contributor to the increasing TFEC, growing at an annualized rate of 8 percent per year. Its share among APEC economies rose from 21.8 percent in 2005 to 32.1 percent in 2012 (Table 3.18).

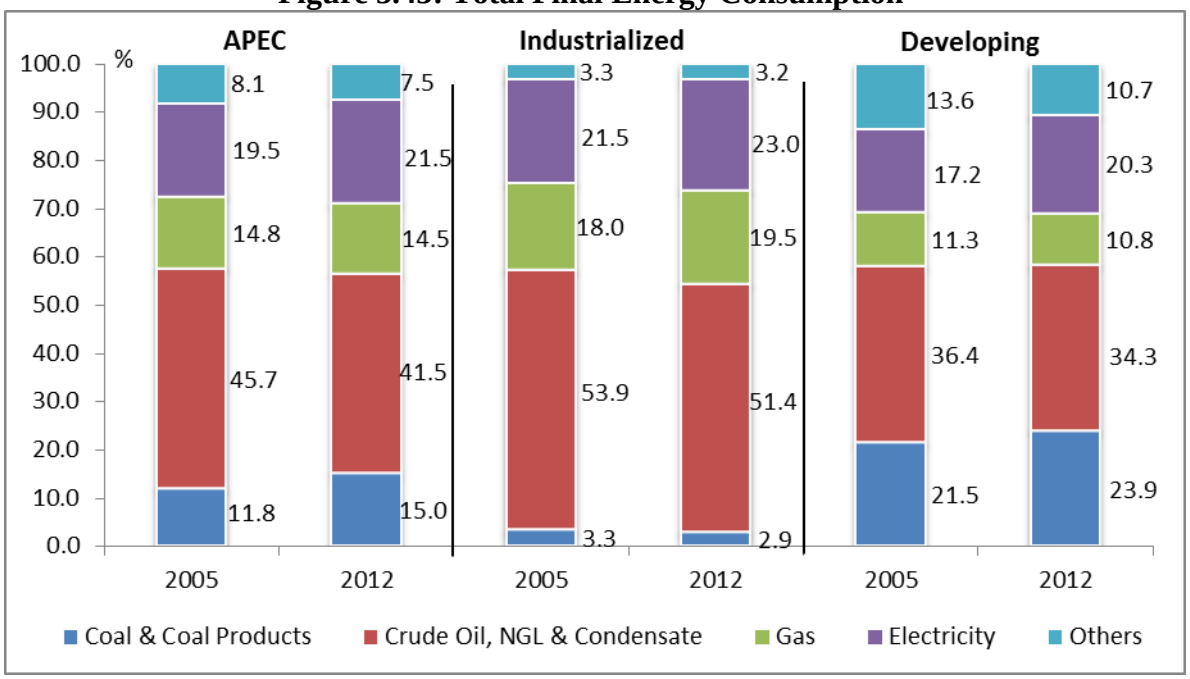
Table 3.18: Top 5 APEC Economies with Highest Total Final Energy Consumption (Share within APEC)

2005		2012	
United States	37.5	China	32.1
China	21.8	United States	29.6
Russia	9.9	Russia	9.3
Japan	8.5	Japan	6.5
Canada	4.9	Canada	4.3

Source: APEC Energy Database and APEC Secretariat, Policy Support Unit calculations

A closer examination of the TFEC showed that most of the energy sources were used for the production of crude oil, natural gas liquids and condensate (Figure 3.43). In addition, it is noticeable an upward trend in the generation of electricity in both APEC-industrialized and -developing economies.

Figure 3.43: Total Final Energy Consumption



Source: APEC Energy Database, IEEJ and APEC Secretariat, Policy Support Unit calculations

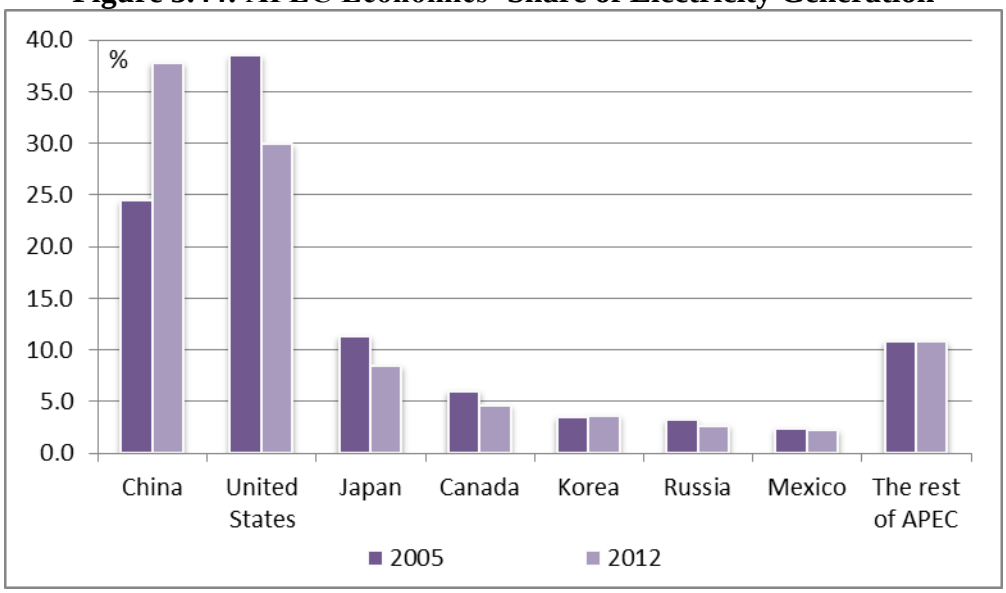
For APEC-industrialized economies, the production of crude oil, natural gas liquids and condensate consumed most of the energy despite the fact that it has been decreasing at an average rate of 1.9 percent per year between 2005 and 2012. While Australia and Canada used more energy sources in producing oil and gas and related products; Japan; New Zealand and the United States reported the opposite. The growing trend in energy used for electricity generation was dominated by Japan and United States, which accounted together for more than 85 percent of the electricity generated by APEC-industrialized economies during 2005 to 2012[76].

[76] U.S. Energy Information Administration's International Energy Statistics and BP Statistical Review of World Energy 2014. See http://www.eia.gov/beta/international/analysis.cfm?iso=JPN

Among APEC-developing economies, More than one-third of the energy used goes to the production of oil and gas and related products. It is also noticeable a positive trend in the usage of energy in electricity generation in these economies.

Electricity generation in the APEC region has been rising steadily during 2005 to 2012 at an average rate of 3.7 percent per annum, supported mostly by APEC-developing economies, which increased their electricity generation at an average rate of 7.8 percent per year (Figure 3.44). Viet Nam; China; and Peru were the three APEC economies with the largest increases in the production of electricity. China has surged as the top electricity producer in APEC, explaining 37.8 percent of the electricity generated by the APEC region in 2012.

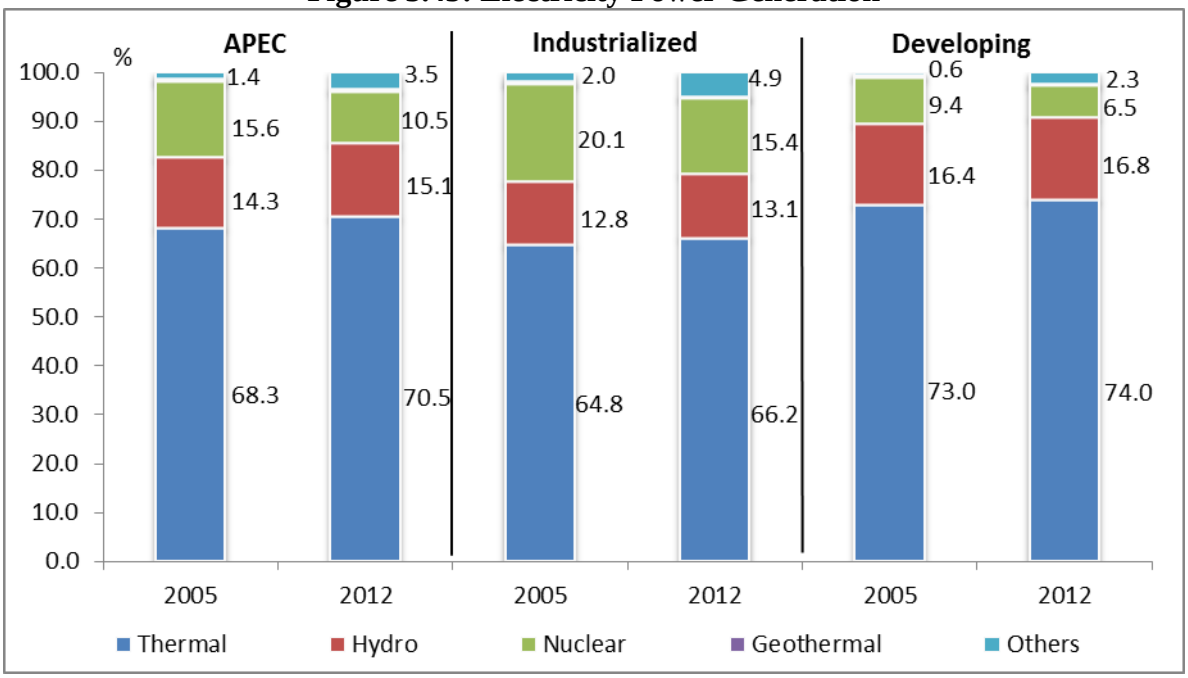
Figure 3.44: APEC Economies' Share of Electricity Generation



Source: APEC Energy Database, IEEJ and APEC Secretariat, Policy Support Unit calculations

When examining the sources used in electricity generation within APEC, thermal remained the dominant source in APEC. About 70.5 percent of the electricity generated in APEC came from this source in 2012. Hydro and nuclear sources are the second and third most important sources, albeit far behind thermal sources (Figure 3.45). Other sources, including renewables (excluding hydro), have increased in popularity, but they only explained a small share of the electricity generated in APEC (1.4 percent in 2005 and 3.5 percent in 2012).

Figure 3.45: Electricity Power Generation



Source: APEC Energy Database, IEEJ and APEC Secretariat, Policy Support Unit calculations.

According to the APEC Energy Database and the Institute of Energy Economics, for APEC-industrialized economies, the increasing usage of thermal sources to generate electricity was solely driven by Japan, whose share of electricity generated from thermal sources surged to 84.6 percent in 2012 from 62.3 percent in 2005. Nuclear has been the second largest source of electricity generation in these economies, despite its decline in popularity after the 2011 earthquake in Fukushima, Japan. The share of nuclear power to generate electricity in Japan went down from 25.4 percent in 2005 to merely 1.6 percent in 2012.[77]

For APEC-developing economies, thermal sources generated almost three-quarter of the electricity during 2005 to 2012. Hydro has been the second largest source. At the individual level, while economies like Peru and Russia obtained a great percentage of their electricity from hydro power; Korea and Chinese Taipei generated most of the electricity using thermal sources.

When thermal sources are disaggregated, coal remains as the main source of electricity generation. Based on World Bank data, coal accounts for around half of the electricity generated from 2005 to 2011. However, for APEC-industrialised economies, their reliance on coal has been declining, due to their increasing utilization of natural gas to generate electricity (from 17.4 to 24.6 percent). For APEC-developing economies, the utilization of coal increased from 58.2 to 64.2 percent, while natural gas use dropped slightly from 14.7 to 12.9 percent.

Industry was the only sector which posted an increasing share in energy consumption. This was largely driven by APEC-developing economies, which consistently used more than half of their energy in the industry sector. By 2012, 57.1 percent of the energy consumption was explained by this sector. While the industrial consumption of energy in APEC-developing economies grew at an annualized rate of 6.4 percent between 2005 and 2012; it dropped 2.1 percent per annum in APEC-industrialized economies.

[77] U.S. Energy Information Administration's International Energy Statistics and BP Statistical Review of World Energy 2014. See http://www.eia.gov/beta/international/analysis.cfm?iso=JPN

For APEC-industrialized economies, transport remained as the sector with the largest energy consumption over the period 2005-2012. By 2012, 38.2 percent of the energy consumption in these economies was explained by this sector. The United States accounted for 77 percent of the energy consumption in transportation by APEC-industrialized economies. In these economies, the use of energy by residential and commercial sectors was also significant. 30.8 percent of the energy consumption was explained by these sectors (Figure 3.46).

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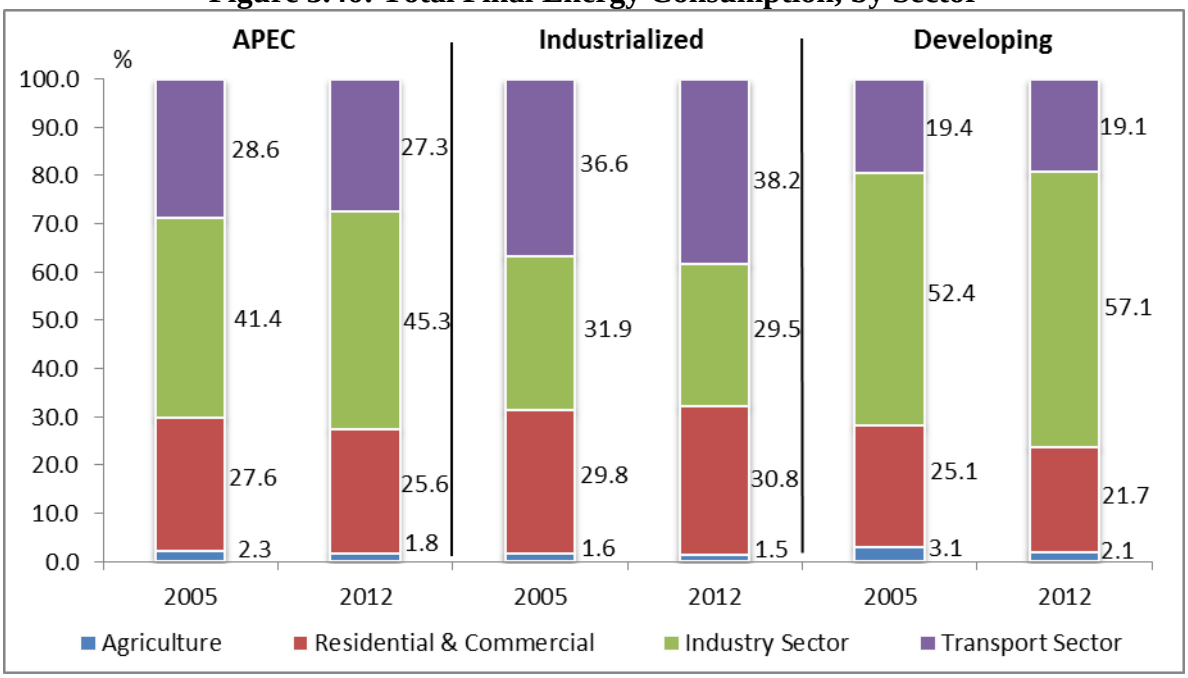
Figure 3.46: Total Final Energy Consumption, by Sector



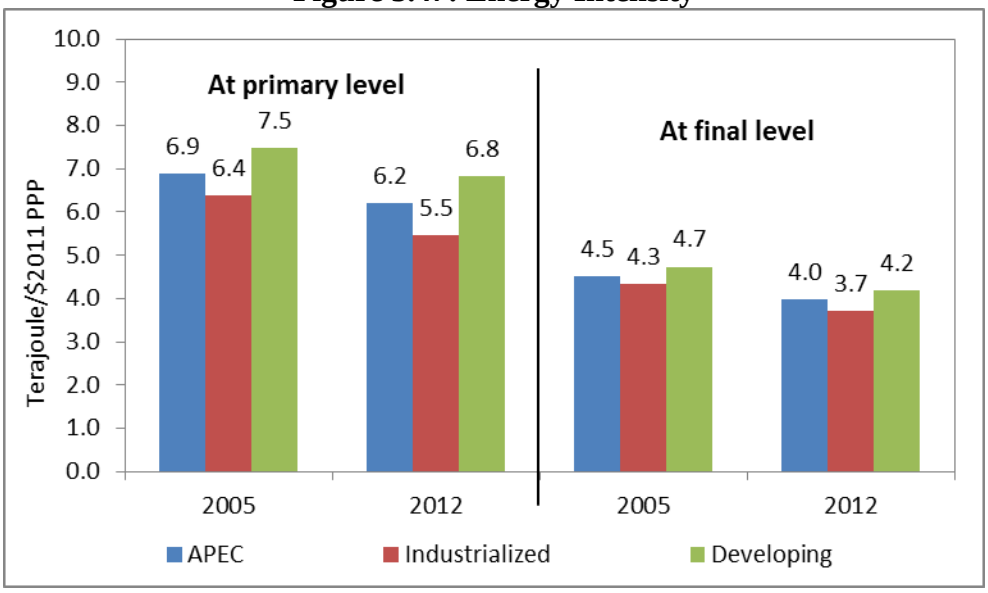
Source: APEC Energy Database, IEEJ and APEC Secretariat, Policy Support Unit calculations.

Energy Intensity

Energy intensity measures the amount of energy required to produce each additional unit of GDP. A lower value indicates less energy required and subsequently more efficient use of energy. This is being measured at two levels: primary and final level. Primary energy supply consists of indigenous production, net imports plus changes in international marine and aviation bunkers and stock changes. Final level represents the total energy consumption in the end-use sectors including industry, transport, residential and commercial, among others.

As shown in Figure 3.47, energy efficiency in the APEC region has improved at the primary level with both APEC-industrialized and -developing economies reporting good progress. At the individual level, Canada; China and Russia reported the greatest progress in energy intensity at this level, as they used 16.5 percent, 13.4 percent and 9.5 percent less energy to produce an additional unit of GDP in 2012, in comparison to 2005. In general, APEC has reported progress in reducing the energy intensity between 2005 and 2012. Only two APEC economies reported an increase in energy intensity during this period.

Figure 3.47: Energy Intensity



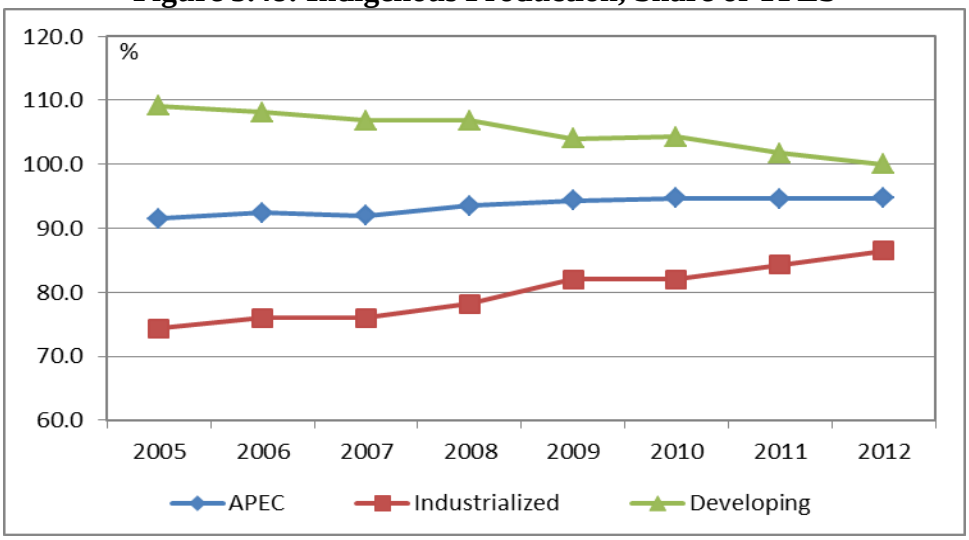
Source: APEC Energy Database, IEEJ and APEC Secretariat, Policy Support Unit calculations.

Similarly, increased energy efficiency was evident at the final level. Both APEC-industrialized and developing economies reduced their energy intensity between 2005 and 2012, being the APEC-industrialized economies those that reduced more in their energy intensity. At the economy level, 19 out of 21 economies in the APEC region increased their energy efficiency (reduced their energy intensity) during this period.

Energy Security

Besides improving energy efficiency, enhancing energy security is another issue APEC economies need to consider for the implementation of the APEC Growth Strategy. The APEC region as a whole reported a more secured energy supply supported by higher indigenous production of energy (Figure 3.48). This was driven by APEC-industrialized economies as most of them posted larger shares of indigenous sources to produce energy. APEC-developing economies in general were more energy self-sufficient than APEC-industrialized economies, since they could produce all of their energy from domestic resources. However, for APEC-developing economies, they experienced a decreasing trend in indigenous production of energy as share of their TPES.

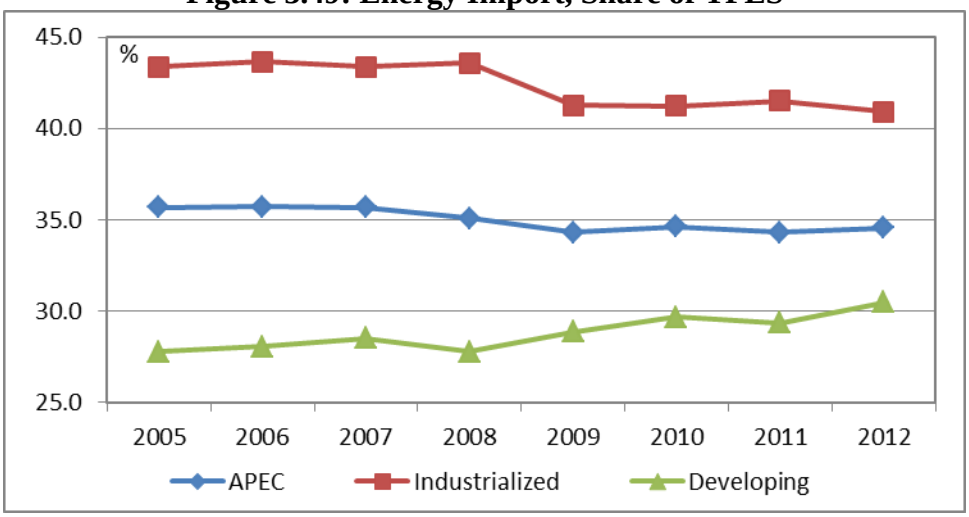
Figure 3.48: Indigenous Production, Share of TPES



Source: APEC Energy Database, IEEJ and APEC Secretariat, Policy Support Unit calculations

From the import perspective, APEC economies imported around one-third of their energy (Figure 3.49). APEC-industrialized economies imported more than APEC-developing economies in relative terms, but the gap between the two groups has been narrowing. Top energy importers in the APEC region include China; Japan; Korea; and the United States, with the four combined accounting for 71.4 percent of total energy imports in the APEC region by 2012. Among the four economies, it is noticeable that China and the United States posted contrasting trends. While China's share of APEC energy imports grew from 8.1 percent in 2005 to 19.3 percent in 2012; the United States' share dropped from 36.8 percent in 2005 to 24.1 percent in 2012.

Figure 3.49: Energy Import, Share of TPES



Source: APEC Energy Database, IEEJ and APEC Secretariat, Policy Support Unit calculations.

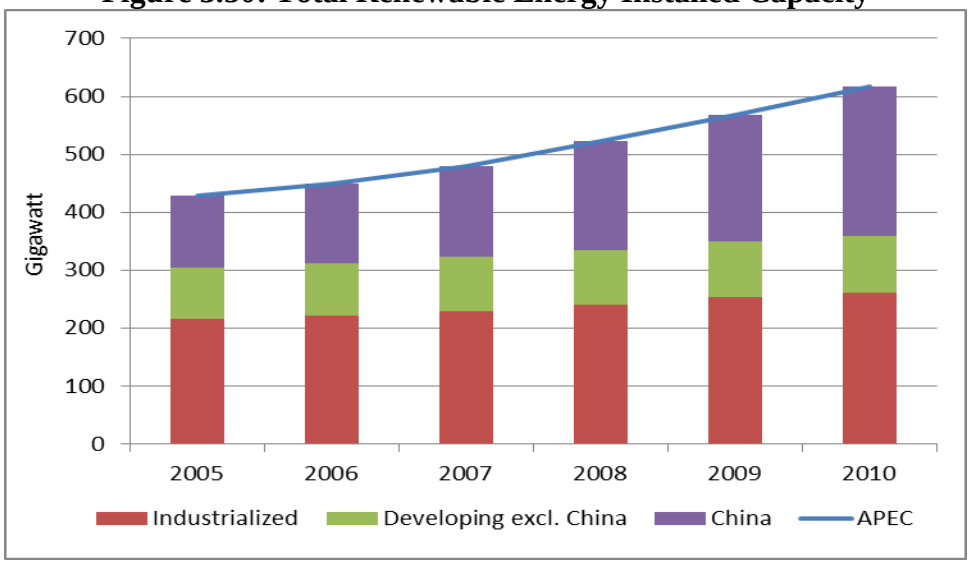
Renewable Energy Capacity

As APEC economies strive to develop a low-carbon energy sector, it is vital to promote deployment of renewable power sources to replace carbon-intensive energy sources and reduce global warming emissions. Moreover, increased use of renewable energy will also help to alleviate air and water pollution emitted by traditional fossil fuel sources. Despite the fact that renewable energy sources only accounted for a minor share of the electricity generation in

APEC, there are signs that APEC economies have been expanding their renewable energy capacity. In fact, APEC-developing economies increased their renewable energy installed capacity at an average rate of 10.8 percent per annum between 2005 and 2010, much faster than APEC-industrialized economies, whose renewable energy capacity grew up at an average annual rate of 4 percent (Figure 3.50).

The strong growth from the APEC-developing economies was largely supported by China's surge in its installed renewable energy capacity, which grew at an average rate of 16 percent from 2005 to 2010. As a result, China's installed capacity constituted more than 41.9 percent of APEC economies' total renewable energy capacity by 2010.

Figure 3.50: Total Renewable Energy Installed Capacity



Source: World Bank – Sustainable Energy for All and APEC Secretariat, Policy Support Unit calculations.
Note: Data for Chinese Taipei is not available

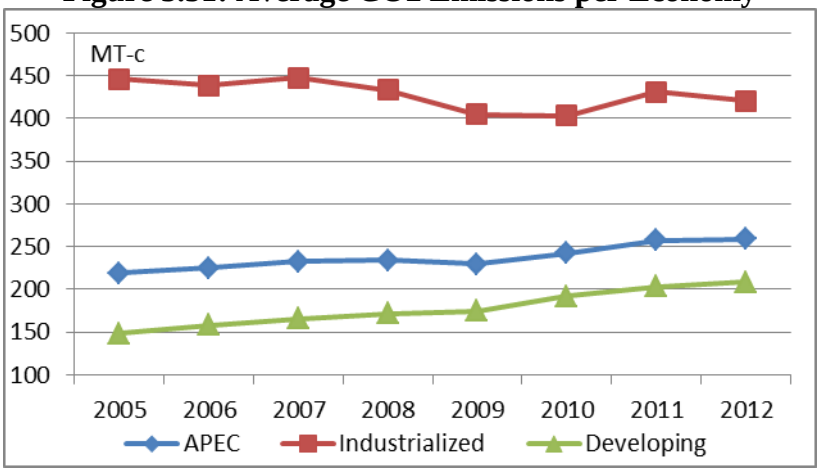
While most of the renewable energy installed capacity in APEC is still explained by APEC-industrialized economies, the participation of renewables in the generation of electricity is becoming more important for APEC-developing economies. In fact, for APEC-developing economies, 20.2 percent of their installed electricity generation capacity came from renewable sources and this proportion further increased to 22.3 percent in 2010. For APEC-industrialized economies, renewable energy capacity accounted for 15 percent of total capacity in 2005 and this rose to 17.1 percent in 2010.

3.4.2 Building a Low-Carbon Society

Monitoring greenhouse gas emissions and establishing a low-carbon society is another goal that APEC economies wish to pursue as part of its plan to build sustainable green economies. While APEC-industrialized economies have managed to curb their carbon dioxide (CO2) emissions and reduced it at an average rate of 0.8 percent per year from 2005 to 2012, APEC-developing economies increased their emissions at 5 percent per year. APEC-developing economies all together explained 51.6 percent of APEC's CO2 emissions in 2005 and went up to 61.4 percent by 2012.

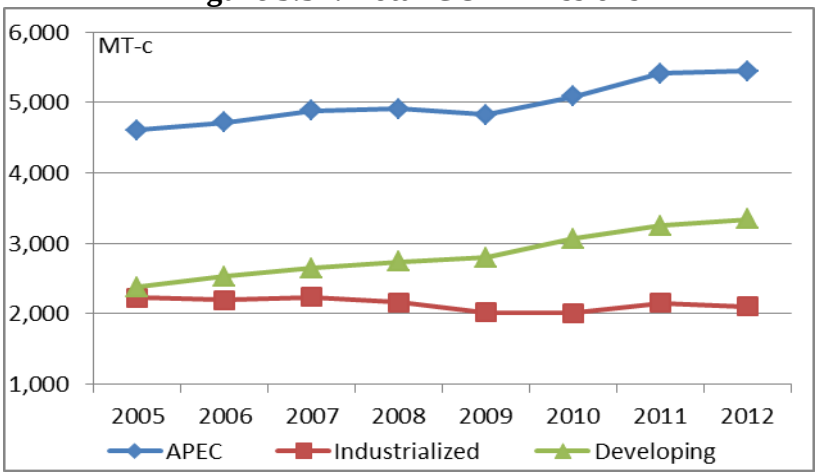
In average terms, APEC-industrialized economies still have a higher level of CO2 emissions in comparison to APEC-developing economies, but this gap is narrowing down.

Figure 3.51: Average CO2 Emissions per Economy



Source: APEC Energy Database, IEEJ and APEC Secretariat, Policy Support Unit calculations.

Figure 3.52: Total CO2 Emissions



Source: APEC Energy Database, IEEJ and APEC Secretariat, Policy Support Unit calculations.

In general, it is the largest APEC economies who explains most of the CO2 emissions. China became in recent years the APEC economy with the highest level of CO2 emissions. Its share of CO2 emissions among all APEC economies climbed from 30.3 percent in 2005 to 40.8 percent in 2012 (Table 3.19).

Table 3.19: Top 5 Economies Producing CO2 Emissions, Share of Total

2005		2012	
United States	35.7	China	40.8
China	30.3	United States	28.0
Russia	8.9	Russia	7.3
Japan	7.1	Japan	6.1
Canada	3.2	Korea	2.8

Source: APEC Energy Database, IEEJ and APEC Secretariat, Policy Support Unit calculations.

It has been the same five economies that producing the lowest amounts of CO2 emissions in 2005 and 2012. In 2012, four out of the five economies were among the five smallest economies in APEC. This again pointed to the positive relationship between the size of an economy and its CO2 emissions.

Table 3.20: Bottom 5 Economies Producing CO2 Emissions, Share of Total

2005		2012	
Papua New Guinea	0.03	Papua New Guinea	0.03
Brunei Darussalam	0.03	Brunei Darussalam	0.04
Peru	0.17	New Zealand	0.16
New Zealand	0.20	Hong Kong, China	0.22
Hong Kong, China	0.22	Peru	0.24

Source: APEC Energy Database, IEEJ and APEC Secretariat, Policy Support Unit calculations

Taking into account the size of population, the amount of CO2 emissions per capita revealed a similar pattern between APEC-industrialized and -developing economies. While APEC-industrialized economies have higher emissions per capita, they have been on a downward trend. For APEC-developing economies, their CO2 emissions per capita have increased in recent years (Table 3.21).

Table 3.21: CO2 Emissions per capita, tonne-carbon/person

	2005	2006	2007	2008	2009	2010	2011	2012
APEC	1.7	1.8	1.8	1.8	1.8	1.8	2.0	2.0
APEC-Industrialized	4.6	4.5	4.6	4.4	4.1	4.1	4.3	4.2
APEC-Developing	1.1	1.2	1.2	1.2	1.3	1.4	1.4	1.5

Source: APEC Energy Database, IEEJ and APEC Secretariat, Policy Support Unit calculations.

As shown in Table 3.22, the United States; Australia; Canada and Brunei Darussalam have consistently been among the economies with relatively high CO2 emissions per capita.

Table 3.22: Top 5 Economies with CO2 Emissions per capita, KT-c/person

2005		2012	
United States	5.6	Brunei Darussalam	5.5
Australia	5.0	United States	4.8
Canada	4.6	Australia	4.4
Brunei Darussalam	3.8	Canada	4.1
Singapore	3.5	Korea	3.0

Source: APEC Energy Database, IEEJ and APEC Secretariat, Policy Support Unit calculations

The five economies with the lowest CO2 emissions per capita have stayed unchanged in 2012 compared to 2005 (Table 3.23).

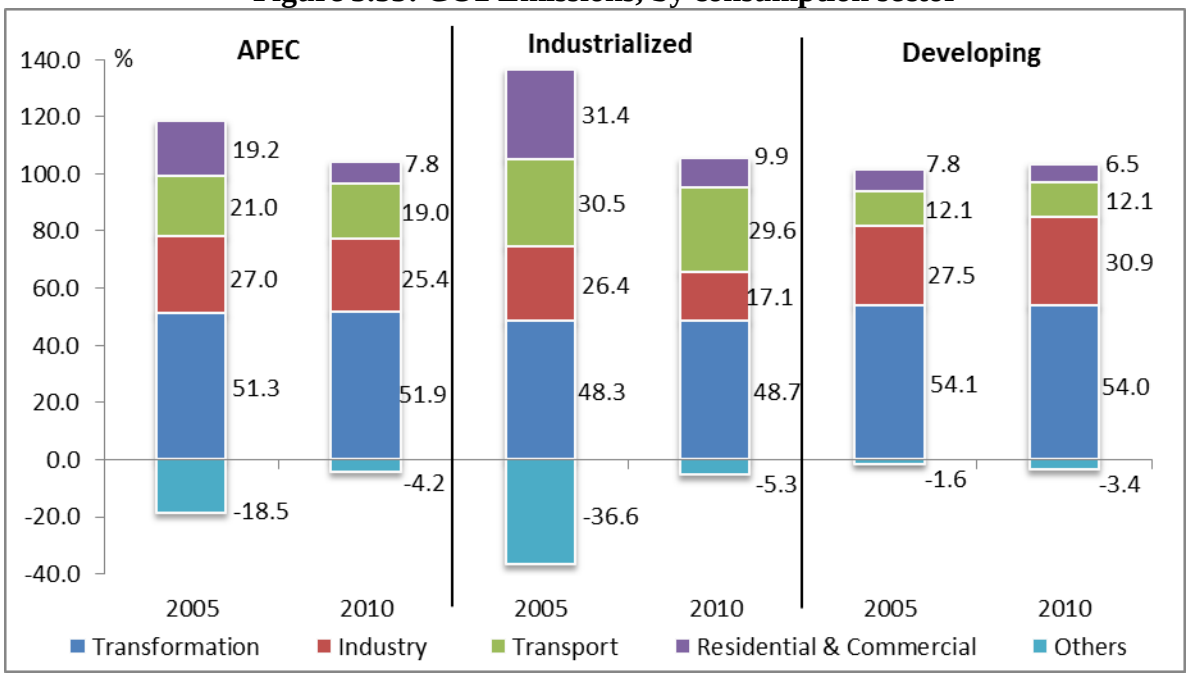
Table 3.23: Bottom 5 Economies with CO2 Emissions per capita, KT-c/person

2005		2012	
Papua New Guinea	0.21	Papua New Guinea	0.19
Philippines	0.22	Philippines	0.22
Viet Nam	0.26	Viet Nam	0.39
Peru	0.29	Peru	0.43
Indonesia	0.41	Indonesia	0.57

Source: APEC Energy Database, IEEJ and APEC Secretariat, Policy Support Unit calculations

A detailed examination of CO2 emissions by consumption sectors revealed that the transformation sector was responsible for the largest CO2 emissions in APEC, mainly from public utilities (Figure 3.53).[78]

Figure 3.53: CO2 Emissions, by consumption sector



Source: APEC Energy Database, IEEJ and APEC Secretariat, Policy Support Unit calculations.

CO2 emissions from APEC-industrialized economies fell substantially in the industrial and residential & commercial sectors by 10.2 percent and 22.2 percent per year, respectively. Lower CO2 emission levels by the United States between 2005 and 2010 were the driver behind this improvement.

On the other hand, APEC-developing economies have increased CO2 emissions. This is mostly explained by the industrial sector, which posted a 7.7 percent increase per year in CO2 emissions over the same period.

Under the category "Others", negative CO2 emissions refer to emissions that are actively removed from the atmosphere and sequestered. This can be achieved by extensive reforestation and forest growth, or by schemes which combine bioenergy use with carbon capture and storage. Developing and deploying negative emissions technologies is a critical factor in contributing to the goal of building a low-carbon society, since they help to reduce CO2 concentration levels.[79] The reduced proportion of negative CO2 emissions in APEC in 2010 was largely resulted from the plunge of negative CO2 emissions in APEC-industrialized economies.[80]

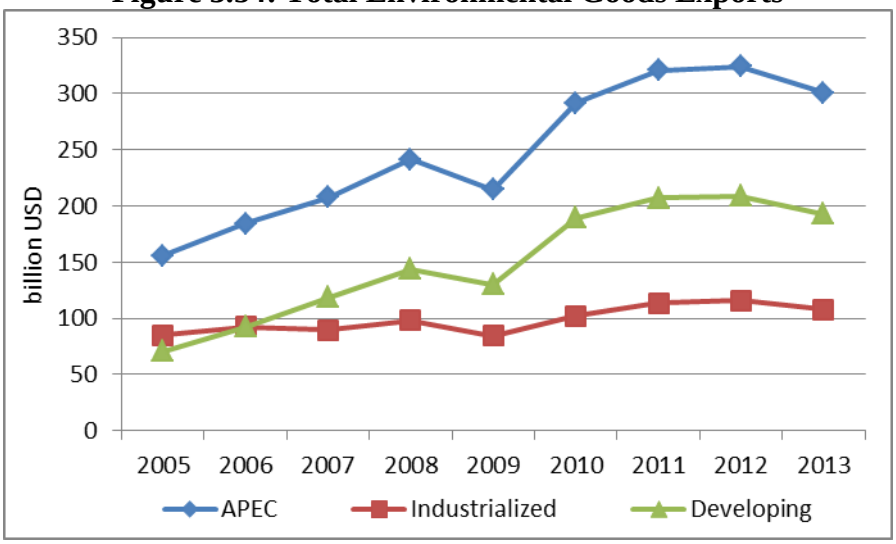
[78] The classification is based on IPCC Reference Approach, which provides a rapid estimate of the total CO2 emissions from fuels supplied. The transformation sector covers fuels transformed into secondary fuels by physical or chemical processes not involving combustion or fuels combusted to generate electricity. Transformation sector includes main activity producers, auto producers, gas processing and own use & loss.
[79] OECD Environmental Outlook to 2050
[80] The Emissions Gap Report 2014 - UNEP

3.4.3 Facilitating Environmental Goods and Services (EGS) Trade

Improving the access for environmental goods and services (EGS) has been one of APEC's aspirations for many years. APEC took a big step forward in September 2012, when the initiative to reduce tariffs on 54 environmental goods to 5 percent or less was endorsed by APEC Leaders. This initiative, known as the APEC List of Environmental Goods, aims to help the APEC community to promote the use of goods that contribute to responsible environmental practices and have access to them at a lower cost.

Looking at the products included in the APEC List of Environmental Goods, their exports in the APEC region went up from USD 155.7 billion to USD 300.7 billion between 2005 and 2013, growing at an annual average rate of 8.6 percent from 2005 to 2013 (Figure 3.54). This is faster than the annual average growth rate of total exports in the APEC region during the same period, which was 7.7 percent. Exports from APEC-developing economies grew at 13.4 percent per annum over the same period and exported USD 193.1 billion in 2013. China was the leading factor behind APEC-developing economies' strong growth, since its exports of environmental goods experienced a four-fold increase during 2005 to 2013. At the end of this period, China accounted for 44.2 percent of the exports of environmental goods by APEC-developing economies.

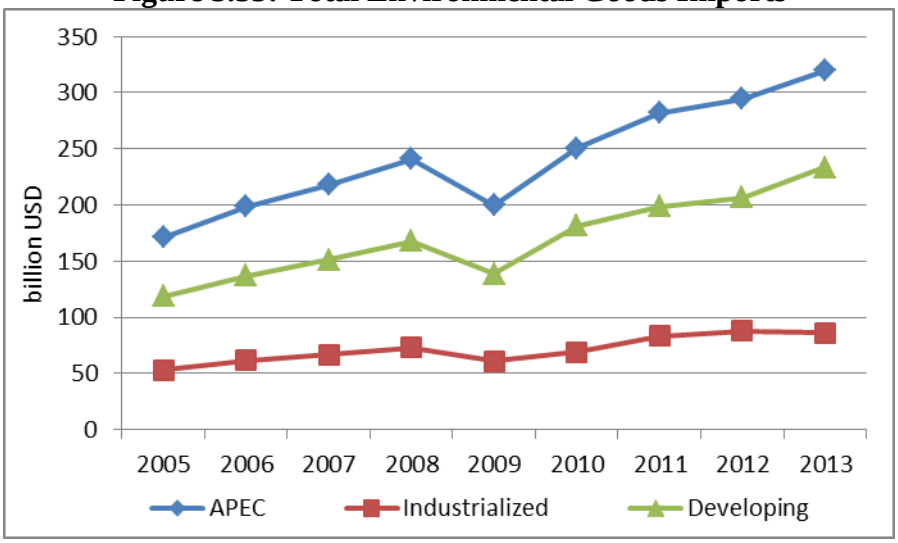
Figure 3.54: Total Environmental Goods Exports



Source: ITC Trade Map and World Bank – WITS and APEC Secretariat, Policy Support Unit calculations.
Note: Data for Brunei Darussalam and Papua New Guinea are based on corresponding mirror data of the partner economies.

In the same way, APEC imports of environmental goods went up from USD 171.3 billion to USD 319.6 billion between 2005 and 2013 (Figure 3.55). Those by APEC-developing economies increased 8.8 percent per annum, while those by APEC-industrialized economies went up at an average annual rate of 6.3 percent. The annual average growth of environmental goods imports has been similar compared to total imports in the APEC region during the same period (8.1 percent).

Figure 3.55: Total Environmental Goods Imports



Source: ITC Trade Map and World Bank – WITS and APEC Secretariat, Policy Support Unit calculations.
Note: Data for Brunei Darussalam and Papua New Guinea are based on corresponding mirror data of the partner economies.

For APEC economies, the rising trade of environmental goods coincided with declining MFN tariffs within APEC (Table 3.24). The average MFN ad-valorem tariff for the 54 environmental goods within APEC went down from 3.9 percent in 2005 to 3.1 percent in 2014. Despite the fact that average MFN tariffs are low, some APEC economies still charge high tariff rates to some environmental products. In fact, the maximum tariff charged by each APEC economy ranged from 0 percent to 35 percent in 2014.

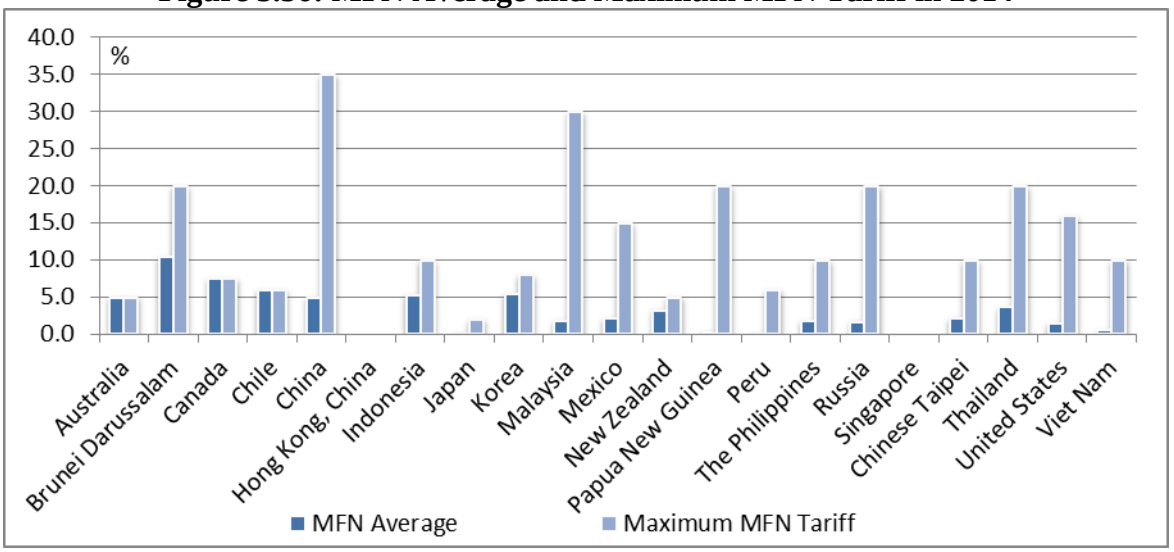
Table 3.24: APEC's MFN Ad-Valorem Tariffs for Environmental Goods

	2005	2014	Difference
MFN average	3.9	3.1	-0.8
Maximum MFN tariff within APEC	35.0	35.0	0.0
Average maximum MFN tariff across APEC economies	13.8	12.2	-1.6

Source: WTO Tariff Database and APEC Secretariat, Policy Support Unit calculations
Note: Data for certain economies have been carried backwards or forward to ensure the APEC aggregate values are comparable.

As shown in Figure 3.56, the gap between the MFN average and maximum MFN tariff among the APEC environmental goods list remains wide for certain APEC economies. The MFN tariff average rates are low for most APEC economies, which suggest that there is significant progress to implement the commitment to reduce tariffs to 5 percent or less. However, the maximum MFN tariff rate is very high in a number of economies. This is an indication that more work needs to be done to fulfil the aforementioned commitment.

Figure 3.56: MFN Average and Maximum MFN Tariff in 2014



Source: WTO Tariff Database and APEC Secretariat, Policy Support Unit calculations.
Note: Data for certain economies have been carried backwards or forward to ensure the APEC aggregate values are comparable

3.4.4 Encouraging the Development of Green Industries

APEC recognizes the important role played by technology and industrial development in growth. In this regard, to support a sustainable growth path, APEC economies have to find ways to encourage the development of green industries and jobs.

One of the ways to encourage the development of green industries is by investing in more research and development (R&D) activities. Unfortunately, the existing data has limitations as it is not possible to obtain statistics related to the R&D expenditure by the private sector. In addition, data on government spending concerning environmental issues and renewable energy is not available for most of the APEC-developing economies. For APEC-industrialized economies, the government spending on R&D related to environmental matters (excluding renewable energy) is still very small, equivalent to only 1.1 percent of the total government expenditure on R&D (Table 3.25). Performances of individual economies varied, being New Zealand the APEC economy with the highest allocation, equivalent to 13.8 percent of their government R&D expenditure.

Table 3.25: Environmentally-related Government R&D Budget, Share of Total Government R&D

	2005	2006	2007	2008	2009	2010	2011	2012	2013
APEC-Industrialized	0.82	0.78	0.86	0.75	0.76	0.83	0.84	1.03	1.11

Source: OECD – Green Growth Indicators and APEC Secretariat, Policy Support Unit calculations

The data available for APEC-industrialized economies also allows to identify how much does the government budget allocate on energy research, development and demonstration (RD&D) goes to renewable energy. In terms of the energy RD&D budget allocated to renewable energy, the share has grown significantly in recent years in all five APEC-industrialized economies (Table 3.26). The raising awareness on environmental and climate-change issues, as well as the rising prices of oil, motivated this surge in funding RD&D related to the development of

renewable energy. New Zealand was the APEC economy that allocated, in relative terms, the highest share of its energy RD&D budget in renewable energy (62.0 percent in 2013).

Table 3.26: Renewable Energy Public RD&D Budget, % Total Energy Public RD&D

	2005	2006	2007	2008	2009	2010	2011	2012	2013
APEC-Industrialized	7.14	7.22	10.12	8.53	17.65	18.29	19.19	22.52	23.51

Source: OECD – Green Growth Indicators and APEC Secretariat, Policy Support Unit calculations.

The development of green industries has also been encouraged through international economic cooperation and technical assistance. Some figures concerning the Official Development Assistance (ODA) offered by certain economies capture international financial flows targeting environment-related issues to support developing economies. International cooperation in environment mainly covers general environmental protection activities and environmental research. In absolute terms, ODA given by APEC-industrialized economies and targeting the environment sector (excluding renewable energy and water-related projects) grew at an average rate of 2.8 percent per annum between 2005 and 2013. The United States and Japan are among the main APEC providers of ODA in this sector.

ODA on renewable energy includes the support of projects to develop power generation from a range of renewable sources. ODA disbursements in this sector have been lower than those allocated in the environment sector (Table 3.27). Japan and Canada were the main providers of ODA in renewable energy in 2013.

Most of the ODA by APEC-industrialized economies in environmental matters is destined to water and sanitation sector. This ODA contains the assistance related to water resource conservation, basic drinking water supply and river basin development, among others. In recent years, ODA to water and sanitation projects fell on average by 4.6 percent per annum during 2005 to 2013. Japan and the United States are the main two ODA donors in this sector.

Table 3.27: APEC-Industrialized economies' ODA allocation, % total allocable ODA

	2005	2006	2007	2008	2009	2010	2011	2012	2013
Environment sector	2.3	1.9	2.8	2.2	2.2	3.9	4.2	3.9	2.3
Renewable energy sector	0.8	2.3	1.1	0.4	0.4	2.8	2.0	0.5	1.9
Water supply and sanitation sector	11.1	7.8	8.4	6.4	8.8	5.6	5.7	7.3	6.3

Source: OECD – Green Growth Indicators and APEC Secretariat, Policy Support Unit calculations

Another way to promote the development of green industries is by providing a system to protect innovations in this area. Patents are used to give inventors exclusive rights to commercialize their inventions for a certain number of years. In this regard, patents seek to incentivize companies/individuals to devote resources in R&D.

No statistics measuring the impact of the innovations in developing green industries are available. However, the number of patents filed could act as a proxy and give an idea about the scale of R&D activities to produce innovations in particular areas. In this sense, the OECD reports the number of patents granted in APEC economies concerning innovations in general environment management issues, which covers those related to air and water pollution

abatement as well as a range of waste management technologies related to solid waste collection, material recycling, incineration and landfilling.

The increasing number of patents related to environmental management between 2005 and 2011 looks encouraging, as they grew at an average yearly rate of 7.4 percent (Table 3.28). Historically, most of the patents have been registered in APEC-industrialized economies, but in recent years APEC-developing economies have increased their contribution. In 2005, 86.5 percent of those patents were registered in APEC-industrialized economies and 13.5 percent in APEC-developing economies. In 2011, APEC-industrialized economies reduced their shares to 77.6 percent, while APEC-developing economies increased theirs to 22.4 percent.

Table 3.28: Total Number of Patents in General Environmental Management

	2005	2006	2007	2008	2009	2010	2011
APEC	1,496	1,684	1,806	1,696	1,905	2,299	2,297
APEC-Industrialized	1,295	1,486	1,569	1,419	1,524	1,805	1,782
APEC-Developing	202	198	237	278	381	494	515

Source: OECD – Science, Technology and Patents and APEC Secretariat, Policy Support Unit calculations.
Note: Data for Brunei Darussalam; Papua New Guinea and Viet Nam are not available.

Patents related to energy efficiency in buildings and lighting cover inventions associated to insulation, heating and lighting (Table 3.29). Many of the efforts to reduce CO2 emissions in APEC-industrialized economies come from the residential sector. New technologies in building systems could contribute to reduce CO2 emissions. Similarly, within APEC, most of the patents in this area have been registered in APEC-industrialized economies (84.9 percent of them in 2011).

Table 3.29: Total Number of Patents in Energy Efficiency in Buildings and Lighting

	2005	2006	2007	2008	2009	2010	2011
APEC	466	483	612	614	753	844	948
APEC-Industrialized	407	410	535	540	643	716	805
APEC-Developing	58	73	77	74	110	128	143

Source: OECD – Science, Technology and Patents and APEC Secretariat, Policy Support Unit calculations.
Note: Data for Brunei Darussalam; Papua New Guinea and Viet Nam are not available.

Patents for technologies specific to climate change mitigation mainly include technologies designed to capture, store, sequestrate or dispose of greenhouse gases. Despite filling only a small fraction of patents compared to APEC-industrialized economies, APEC-developing economies have been able to raise their registration of patents in this area in recent years (Table 3.30). While APEC-industrialized economies reduced their share from 93.8 percent to 85.5 percent between 2005 and 2011; APEC-developing economies increased it from 6.2 percent to 14.5 percent.

Table 3.30: Total Number of Patents in Technologies Specific to Climate Change Mitigation

	2005	2006	2007	2008	2009	2010	2011
APEC	129	126	195	185	227	230	246
APEC-Industrialized	121	120	183	174	203	208	210
APEC-Developing	8	7	12	11	24	21	36

Source: OECD – Science, Technology and Patents and APEC Secretariat, Policy Support Unit calculations.
Note: Data for Brunei Darussalam; Papua New Guinea and Viet Nam are not available.

3.4.5 Promote Conservation and Sustainable Management of Resources

Another area associated to the promotion of sustainable (green) growth is the conservation and sustainable management of natural resources such as forest, soil, marine and freshwater supplies.

Forest Resources

Forest management has been identified as one of the main area that APEC needs to focus on in order to promote more sustainable management of agriculture and natural resources. Indeed, initiatives in APEC, such as the creation of an Experts Group on Illegal Logging and Associated Trade (EGILAT) in 2011, reflect the importance given by APEC to manage forestry in a responsible way.

The percentage of forest areas has not changed much within the APEC region (Table 3.31). In 2012, around 35.9 percent of the APEC land areas were comprised by forest areas.

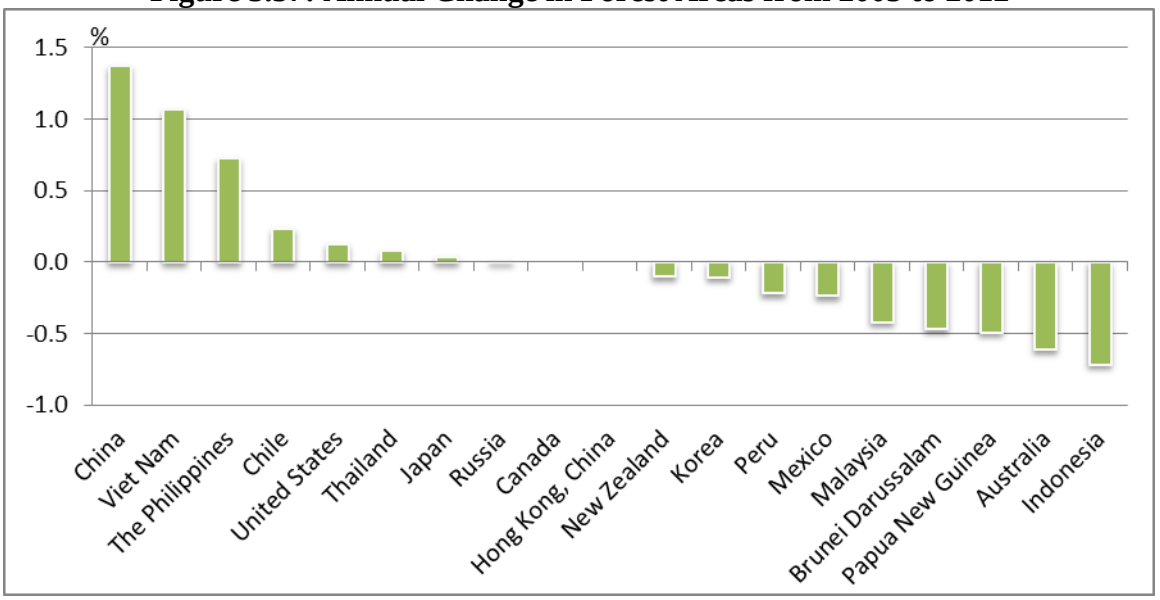
Table 3.31: Forest Area, % of Land Area

	2005	2006	2007	2008	2009	2010	2011	2012
APEC	35.7	35.8	35.8	35.8	35.8	35.8	35.9	35.9
APEC-Industrialized	30.1	30.1	30.1	30.0	30.0	30.0	30.0	30.0
APEC-Developing	40.2	40.3	40.3	40.4	40.4	40.5	40.5	40.5

Source: World Bank – Millennium Development Goals and APEC Secretariat, Policy Support Unit calculations.
Note: Data for Hong Kong, China and Chinese Taipei are not available.

APEC economies reported changes in their forest areas by small margins, ranging from 1.3 percent to -0.7 percent, between 2005 and 2012. China and Viet Nam posted the highest increase of the size of their forest area in percentage terms.

Figure 3.57: Annual Change in Forest Areas from 2005 to 2012



Source: World Bank – Millennium Development Goals and APEC Secretariat, Policy Support Unit calculations
Note: Data for Hong Kong, China and Chinese Taipei are not available.

Water Resources

In order to analyse the sustainability of water resources, it is important to measure how much freshwater is available in APEC economies and how much freshwater per person is available. Based on World Bank estimations, the levels of renewable internal freshwater – which consists of internal river flows and groundwater from rainfall – increased for the whole APEC region in 0.01 percent between 2007 and 2013 (Table 3.32). However, in per capita terms, it declined in 0.04 percent. The lower level of internal freshwater resources in per capita terms was largely explained by the higher growth of the APEC's population, in particular in APEC-developing economies; while total internal freshwater resources stayed largely unchanged in cubic meters term.

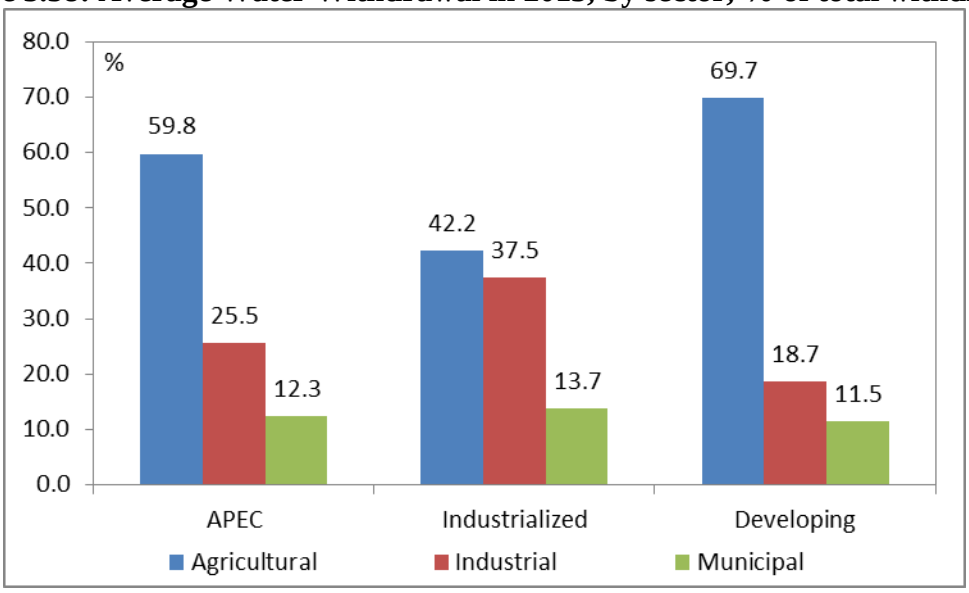
Table 3.32: Total Renewable Internal Freshwater Resources and Renewable Internal Freshwater Resources per Capita

	billion cubic meters			cubic meters/person		
	2007	2013	Change	2007	2013	Change
APEC	21,514	21,517	0.01%	8,081	7,753	-0.7%
APEC-Industrialized	6,917	6,920	0.04%	14,204	13,669	-0.6%
APEC-Developing	14,598	14,598	0.00%	6,710	6,433	-0.7%

Source: World Bank – World Development Indicators and APEC Secretariat, Policy Support Unit calculations.
Note: Data for Hong Kong, China and Chinese Taipei are not available.

Indicators on water withdrawal allow the identification of the sectors that are using most of the water resources. Due to limited data availability, it is only possible to provide a cross-sectional perspective of the use of water in APEC for the year 2013. In overall terms, agricultural by far accounted for the majority of water withdrawal (Figure 3.58). Unsurprisingly APEC-developing economies used more water in the agricultural sector since emerging economies tend to have higher share in agriculture and agriculture sector is also likely to be more water-intensive.

Figure 3.58: Average Water Withdrawal in 2013, by sector, % of total withdrawal



Source: UN – FAO Aquastat and APEC Secretariat, Policy Support Unit calculations.
Note: Data for Canada; Hong Kong, China and Chinese Taipei are not available

Water productivity captures the value of GDP in constant 2005 USD an economy can produce using one cubic meter of freshwater (Table 3.33). Both APEC-industrialized and developing economies raised their water productivity. Technological improvements across the board explain the increased productivity of water in APEC.

Table 3.33: Water Productivity, constant 2005 US$ GDP/cubic meters

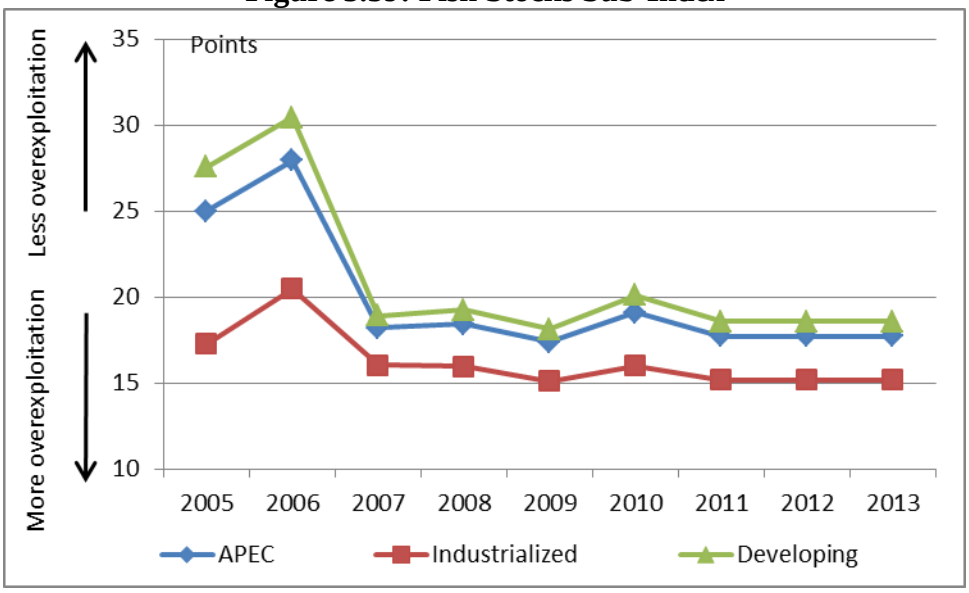
	2007	2013	Difference
APEC	15.7	17.8	2.1
APEC-Industrialized	32.2	33.8	1.6
APEC-Developing	6.3	8.7	2.4

Source: World Bank – World Development Indicators and APEC Secretariat, Policy Support Unit calculations.
Note: Data for Hong Kong, China and Chinese Taipei are not available

Marine Resources

The Center for International Earth Science Information Network (CIESIN) and the Yale Center for Environmental Law & Policy have developed an environmental performance index, which includes a sub-index on fish stocks. This sub-index captures how close an economy is from the target of zero percent of the economy's total catch, within its exclusive economic zone, comprised of species listed as overexploited or collapsed. Based on a scale of 0 to 100, a higher value indicates fish stocks are exploited in a more sustainable manner. Signs of overexploitation started to emerge in the APEC region from 2006 onwards. APEC-industrialized economies, in general, faced greater overexploitation problems.

Figure 3.59: Fish Stocks Sub-Index

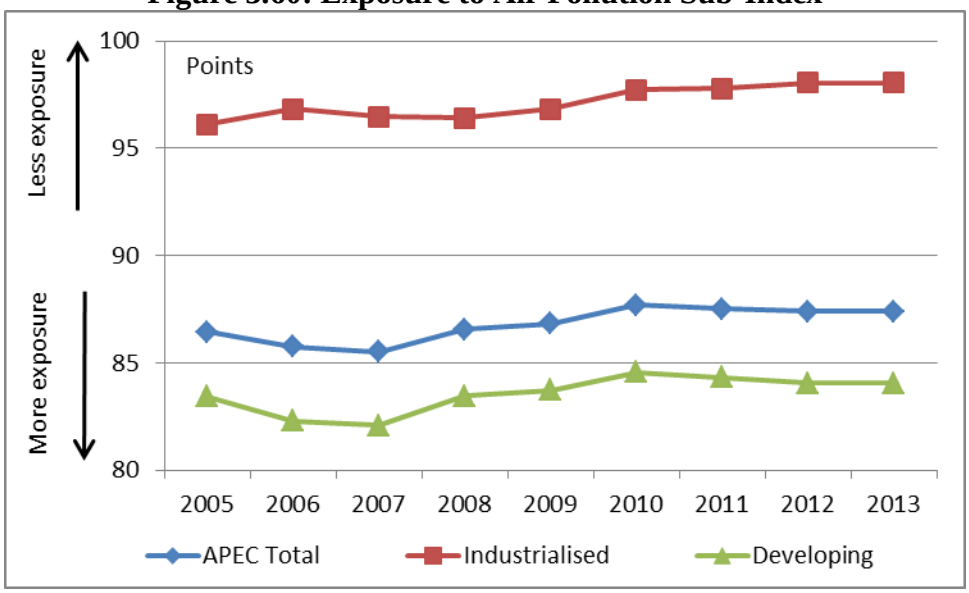


Source: The Center for International Earth Science Information Network (CIESIN), the Yale Center for Environmental Law & Policy – Environmental Performance Index and APEC Secretariat, Policy Support Unit calculations.
Note: Data for Hong Kong, China is not available.

Air quality

The Center for International Earth Science Information Network (CIESIN) and the Yale Center for Environmental Law & Policy have developed a sub-index on exposure to air pollution, which measures how close an economy is from the target of 10 micrograms per cubic meter of average exposure to PM 2.5 (fine particular matter). This sub-index ranges from 0 to 100, with higher values indicating better air quality and less exposure to air pollution. APEC economies as a whole showed marginal improvements in reducing the exposure of the population to air pollution. However, while APEC-industrialized economies reduced the exposure to air pollution in recent years, APEC-developing economies did the opposite.

Figure 3.60: Exposure to Air Pollution Sub-Index



Source: The Center for International Earth Science Information Network (CIESIN), the Yale Center for Environmental Law & Policy – Environmental Performance Index and APEC Secretariat, Policy Support Unit calculations.
Note: Data for Hong Kong, China has been carried backwards and forwards to ensure the APEC aggregate values are comparable.

3.5 INNOVATIVE GROWTH

APEC is aiming for innovative growth to create an economic environment that promotes innovation and emerging economic sectors. In 2010, APEC Leaders underlined the following examples of actions in order to achieve innovative growth: to realize smart socioeconomic activity through ICT applications; to promote digital prosperity; to develop a skilled, adaptable, and professional work-force; to enhance dialogues and information sharing on innovation policy; to promote innovation and creativity through effective, comprehensive, and balanced intellectual property (IP) systems; to promote cooperation on standards; and to promote innovation in life sciences.

3.5.1 R&D Expenditure

R&D expenditure in APEC rose at an annual rate of 3.7 percent during 2005 to 2012, reaching USD 766.5 billion in 2012.[81] For APEC-industrialized economies, the expenditure on R&D grew at an average annual rate of 2.1 percent from 2005 to 2012, reaching USD 598.4 billion in 2012. As seen in Table 3.34, R&D expenditure as a share of GDP rose slightly from 2005's 2.64 percent to 2012's 2.82 percent[82].

Table 3.34: R&D Expenditure, % of GDP

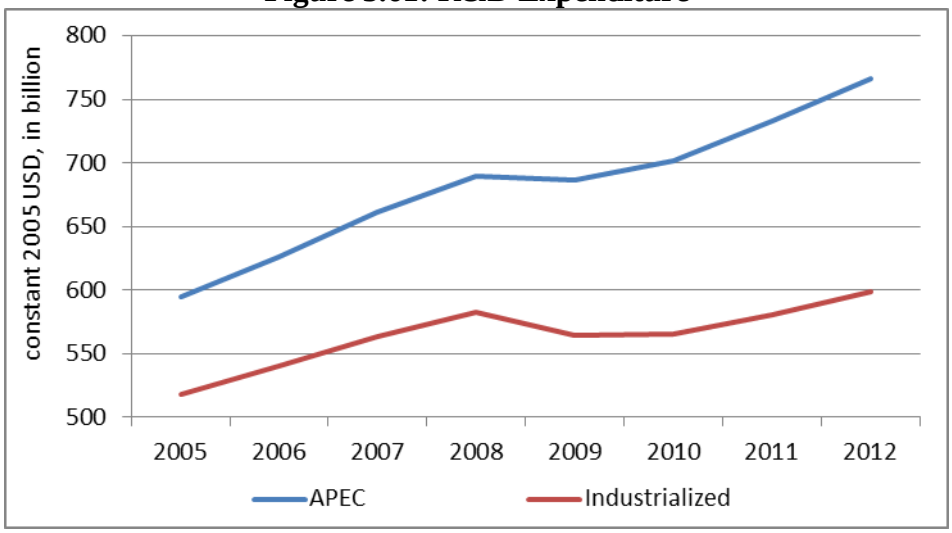
	2005	2006	2007	2008	2009	2010	2011	2012
APEC	2.37	2.41	2.46	2.53	2.56	2.51	2.55	2.58
APEC-Industrialized	2.64	2.69	2.75	2.84	2.85	2.77	2.81	2.82

Source: UNESCO – Science, Technology and Innovation and APEC Secretariat, Policy Support Unit calculations.

For those APEC-developing economies that reported R&D data, it was evident that their R&D expenditure has outgrown their industrialized counterparts.[83] One of the main contributors behind APEC-developing economies' increasing trend was China, whose R&D expenditure grew at an astonishing 16.2 percent per annum during 2005 to 2013.

[81] The figure is in constant 2005 USD.
[82] Due to limited data availability, most of the developing economies in APEC do not report data on R&D expenditure and therefore an aggregate value for APEC-developing economies as a percentage of their GDP could not be calculated.
[83] Data are available for the following 12 economies: Australia; Canada; Chile; China; Japan; Korea; Mexico; New Zealand; Russia; Singapore; Chinese Taipei; United States.

Figure 3.61: R&D Expenditure



Source: UNESCO – Science, Technology and Innovation and APEC Secretariat, Policy Support Unit calculations

Despite robust increases in R&D expenditure from APEC-developing economies, industrialized economies, especially the United States and Japan, still carry a lion's share of the total R&D expenditure in APEC as shown in the table below.

Table 3.35: Top 3 APEC Economies with Highest R&D Expenditure (Share within APEC)

2005		2012	
United States	55.2	United States	52.1
Japan	25.5	Japan	20.5
China	5.0	China	11.5

Source: UNESCO – Science, Technology and Innovation and APEC Secretariat, Policy Support Unit calculations.

In terms of the distribution of the R&D expenditure, business enterprises consistently explained the largest share of total R&D expenditure in APEC, accounting for more than 65 percent of total expenditure during the period 2005 to 2012. The second largest actor was government, explaining between 10 and 20 percent of total R&D expenditure during the same period.

3.5.2 R&D Personnel

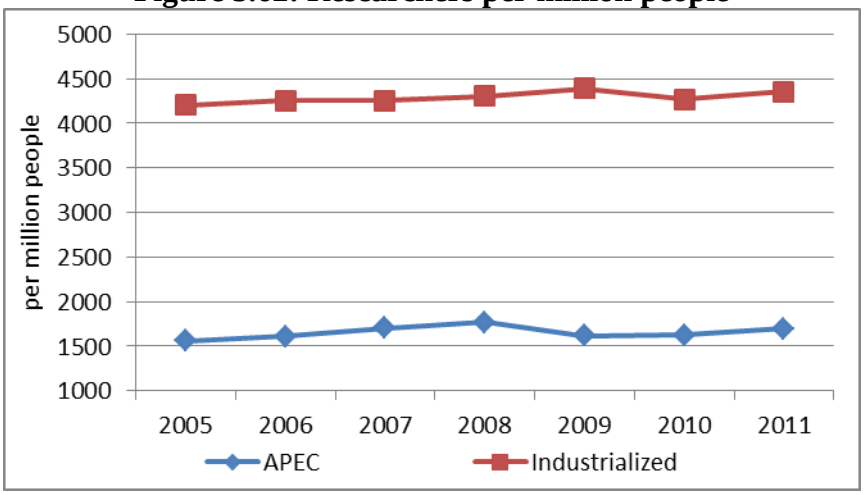
Developing a skilled, adaptable, and professional workforce is an indispensable factor in supporting R&D activities. APEC-industrialized economies have more than double the number of researchers per million people in comparison to the group of APEC economies with data available.[84]

Around one-third of the APEC economies with data available reported fewer researchers per million people in 2011 in comparison to 2005. However, some APEC economies reported an

[84] Researchers here are defined as professionals engaged in the conception or creation of new knowledge, products, processes, methods, systems and management of these projects. The measure here is based on full-time equivalence. Due to limited data availability, no accurate aggregate value for the group of APEC-developing economies could be calculated. The following APEC economies reported data on the number of researchers per million people: Australia; Canada; Chile; China; Hong Kong, China; Indonesia; Japan; Korea; Malaysia; Mexico; New Zealand; Philippines; Russia; Singapore; Thailand and United States.

important increase in the number of researchers, such as Malaysia; Korea; and Singapore, which experienced an average annual growth rate of 30.6 percent, 8.2 percent and 6.0 percent, respectively.

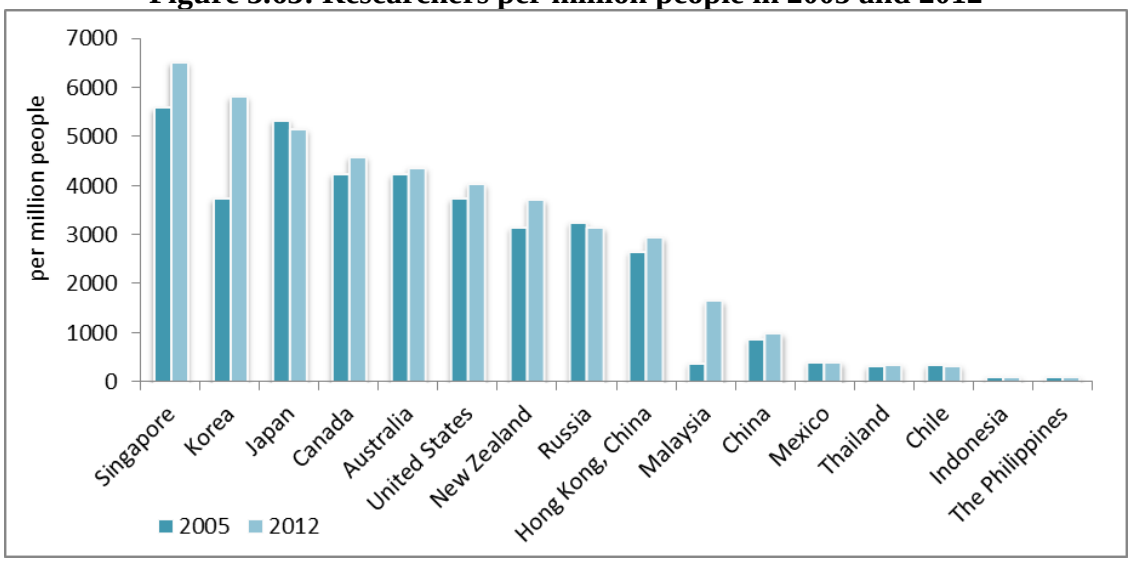
Figure 3.62: Researchers per million people



Source: UNESCO – Science, Technology and Innovation and APEC Secretariat, Policy Support Unit calculations

The number of researchers per million people varied substantially among APEC economies, ranging from 78 to 6,505 during 2005 to 2012. As shown in Figure 3.63, the gap between individual APEC economies remained wide. Most APEC economies reported a higher number of researchers per million people in 2012 compared to 2005. Among them, Korea and Malaysia posted significant improvements.

Figure 3.63: Researchers per million people in 2005 and 2012



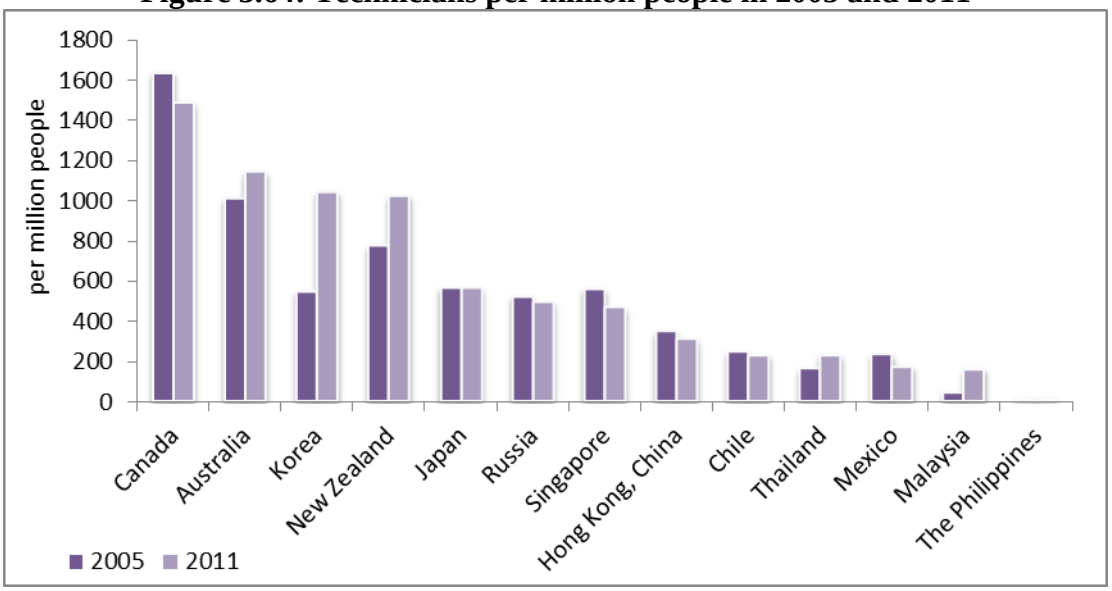
Source: UNESCO – Science, Technology and Innovation and APEC Secretariat, Policy Support Unit calculations.

Technicians are also important personnel in R&D activities by performing scientific and technical tasks, complementing the work of researchers.[85] Due to limited data availability, no

[85] Technicians here are defined as persons whose main tasks require technical knowledge and experience in fields like engineering, physical and life sciences, or social sciences and humanities. The measure here is based on full-time equivalence.

meaningful aggregate for APEC could be calculated. As shown in Figure 3.64, the difference among individual APEC economies is striking.

Figure 3.64: Technicians per million people in 2005 and 2011



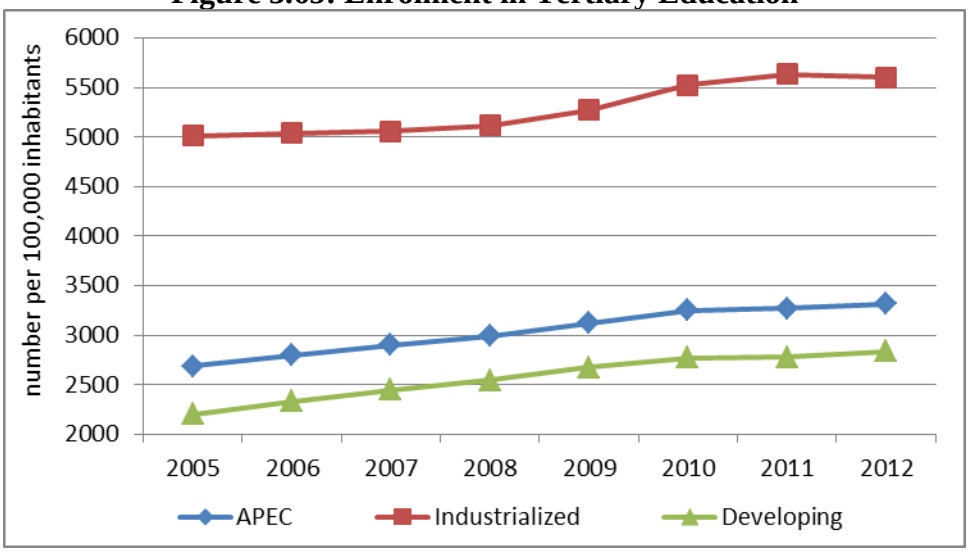
Source: UNESCO – Science, Technology and Innovation and APEC Secretariat, Policy Support Unit calculations.

Around half of the economies reported fewer technicians per million people in 2012 in comparison to 2005. Economies which increased significantly their number of technicians include Korea, Malaysia and New Zealand.

3.5.3 Tertiary Education

Part of the solution to address the insufficiency of qualified researchers and technicians is to enhance tertiary education. Enrolment in tertiary education has improved in APEC, with greater progress in APEC-developing economies. The tertiary education enrolment in APEC-industrialized economies rose at an average of 2.3 percent per annum during 2005 to 2012. For APEC-developing economies, it rose by 4.4 percent per annum.

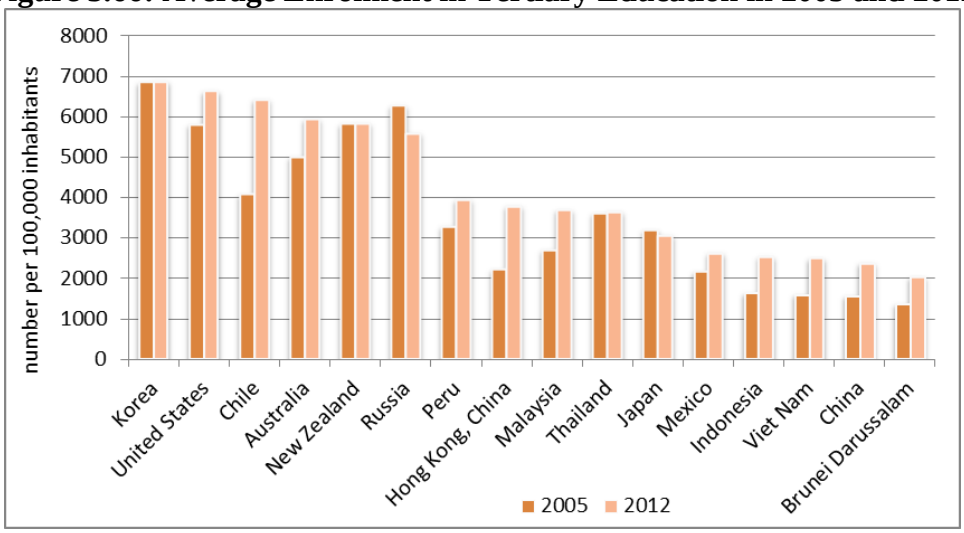
Figure 3.65: Enrolment in Tertiary Education



Source: UNESCO – Education and APEC Secretariat, Policy Support Unit calculations.

Most APEC economies reported progress in relative terms by increasing their tertiary education enrolment levels in 2012 compared to 2005.

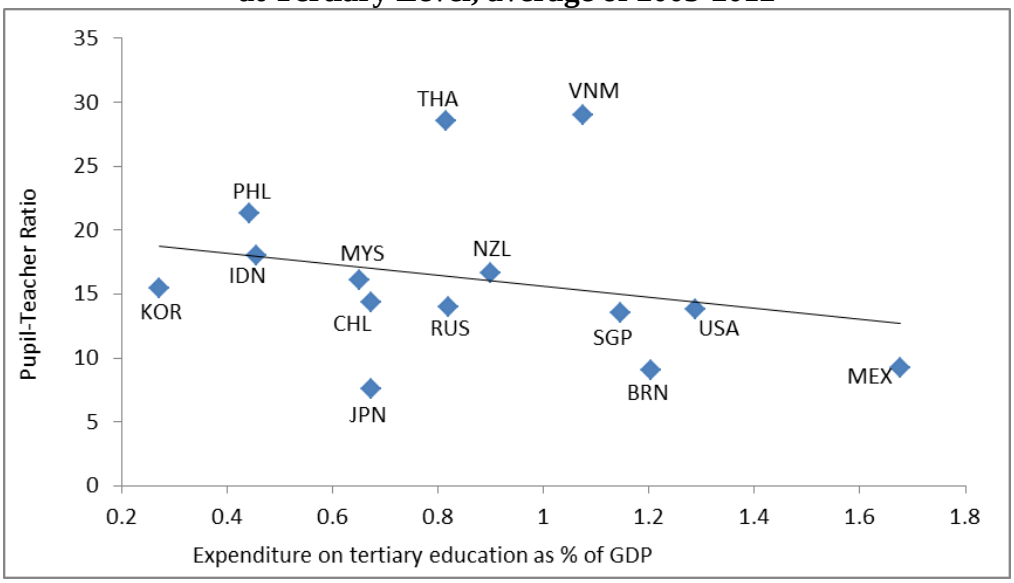
Figure 3.66: Average Enrolment in Tertiary Education in 2005 and 2012



Source: UNESCO – Education and APEC Secretariat, Policy Support Unit calculations

The quality of the tertiary education in each economy in APEC could be a consequence of many factors. Public spending is one of them. Out of the 18 APEC economies reporting data on government expenditure on tertiary education, four of them posted a lower spending proportion in tertiary education -measured as a percentage of GDP- recently in comparison to 2005. Besides low expenditure levels in tertiary education, a high pupil-teacher ratio could be another factor affecting negatively the quality of education. Among the APEC economies that reported pupil-teacher ratios in tertiary education, around half of them posted lower numbers of pupil per teacher in 2012 compared to 2005. Figure 3.67 shows that economies with higher expenditure in tertiary education as percentage of the GDP tend to have lower pupil-teacher ratios.

Figure 3.67: Expenditure on tertiary education as % of GDP and Pupil-Teacher Ratio at Tertiary Level, average of 2005-2012



Source: UNESCO – Education and APEC Secretariat, Policy Support Unit calculations.

3.5.4 Graduates in Science and Engineering

A vibrant innovation system requires a good mix of scientist, engineers, entrepreneurs, and planners (policy makers) for it to function properly. Scientists, engineers and entrepreneurs should be given flexibility in pursuing their objectives to create new knowledge and business opportunities, while policy makers could focus on facilitating innovation through the provision of good regulatory regimes for intellectual property right protection, and promoting mechanisms to maximize funding opportunities for science and engineering. Innovation supports economic growth, as it brings improvements in productivity.

The percentage of graduates in science and engineering[86] in APEC economies varies, ranging from 16 percent to 53 percent. APEC developing economies tend to have higher figures compared with the industrialised economies.

Table 3.36: Graduates in Science and Engineering

	2014
Australia	16.6
Brunei Darussalam	18.3
Chile	19.2
China*	40.0
Hong Kong, China	34.7
Indonesia	22.8
	2014
Japan	20.3
Korea	31.1
Malaysia	37.7
Mexico	26.8
New Zealand	18.3
Russia	28.1
Thailand	53.2
United States	15.5
Viet Nam	24.0

Source: Global Innovation Index data (https://www.globalinnovationindex.org); APEC Secretariat, Policy Support Unit staff calculations.
Note: * Data for China is estimated using the figures from OECD's Education Indicators in Focus report (2012).

It is possible that the higher percentage of science and engineering graduates among all tertiary education graduates in APEC-developing economies is related to the increasing employment opportunities, requiring engineering or science skills such as those in IT or manufacturing industries. Many APEC-developing economies are undergoing a structural transformation in which manufacturing and services are taking a more prominent role in comparison to primary activities (e.g. agriculture). In the developed economies, such as the US, jobs requiring STEM (Science, Technology, Engineering and Mathematics) skills are expected to grow at 1.6% annually for 2008-18[87].

[86] The share of all tertiary graduates in manufacturing, engineering, and construction over all tertiary graduates.
[87] McKinsey Global Institute (2012). "The world at work: Jobs, pay and skills for 3.5 billion people".

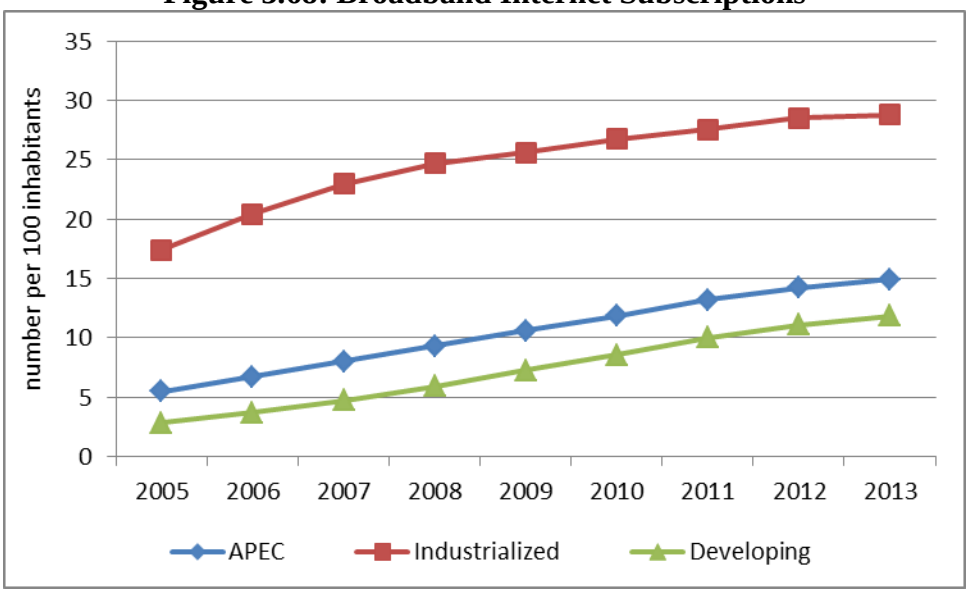
3.5.5 Broadband Internet Subscriptions

APEC Leaders stated in 2013 their commitment to promote the potential benefits of the Internet of Things (IOT) to APEC economies. Vermesan et. al. (2013) highlighted that the goal of the Internet of Things is to enable things to be connected anytime, anyplace, with anything and anyone ideally using any path/network and any service[88]. The application of IOT to areas such as Smart Cities, Smart Ports and Smart Industries brings opportunities (and risks) for economies and businesses to expand and to stay competitive in the global market.

Enhancing the use of ICT systems to promote smart social-economic activities has been one of the issues APEC economies have been focusing on in recent years. In order to fully utilize ICTs and contribute to economic growth, it is essential to adopt high ICT infrastructure standards. For example, high speed broadband helps to build a competitive environment and reduce the times of obtaining and processing information. It also encourages the development of innovative technologies and services.

As shown in Figure 3.68, broadband internet subscription has been expanding rapidly in APEC economies.

Figure 3.68: Broadband Internet Subscriptions

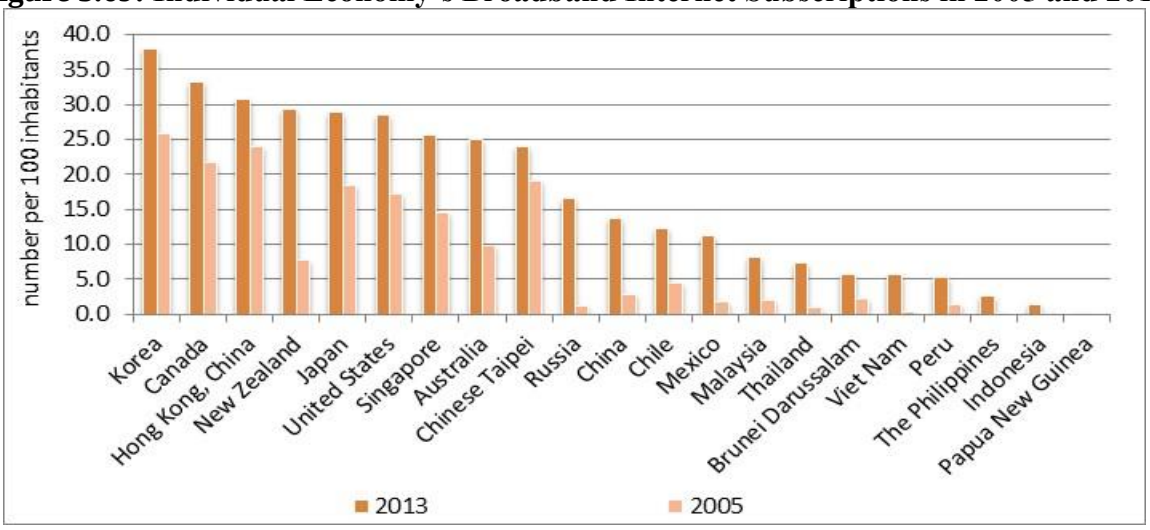


Source: StatsAPEC and International Telecommunication Union (ITU). APEC Secretariat, Policy Support Unit calculations.

Fifteen out of 21 APEC economies have increased their broadband internet subscriptions at double-digit annual rates per year during the period 2005-2013, which is a reflection on how internet is becoming more accessible in recent years. APEC economies are transforming themselves into digital societies. At the regional level, fixed broadband internet subscribers have grown almost three times, from 5.5 to 14.9 per 100 people in APEC.

[88] Vermesan, Ovidiu and Peter Friess (2013). "Internet of Things: From Research and Innovation to Market Deployment", River Publishers: Aalborg.

Figure 3.69: Individual Economy's Broadband Internet Subscriptions in 2005 and 2013

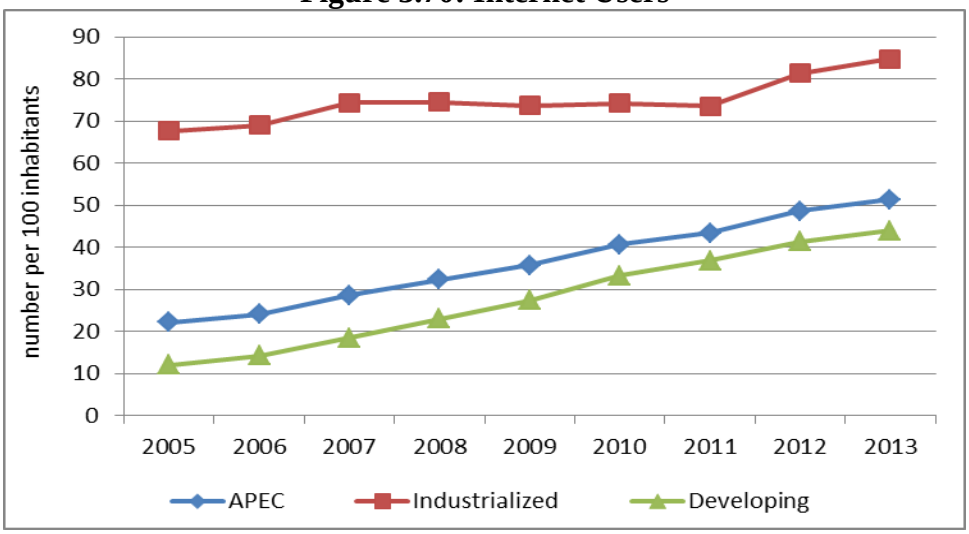


Source: StatsAPEC and International Telecommunication Union (ITU). APEC Secretariat, Policy Support Unit calculations.

It is no surprise that the gap between APEC-industrialized economies and certain APEC-developing economies are still wide. This is because APEC-developing economies in general have weaker information technology-related infrastructure. For instance, the percentage of households with a personal computer was much lower in APEC-developing economies compared to their industrialized counterparts where more than 75 percent of the households have personal computers. For APEC-developing economies, the figures were lower in many cases. Eight of them reported that less than 50 percent of households had personal computers by 2012[89]

Internet penetration rates, measured by the number of internet users, have increased in the APEC region, largely supported by APEC-developing economies. For APEC-industrialized economies, the growth stalled between 2007 and 2011, but started to recover afterwards.

Figure 3.70: Internet Users



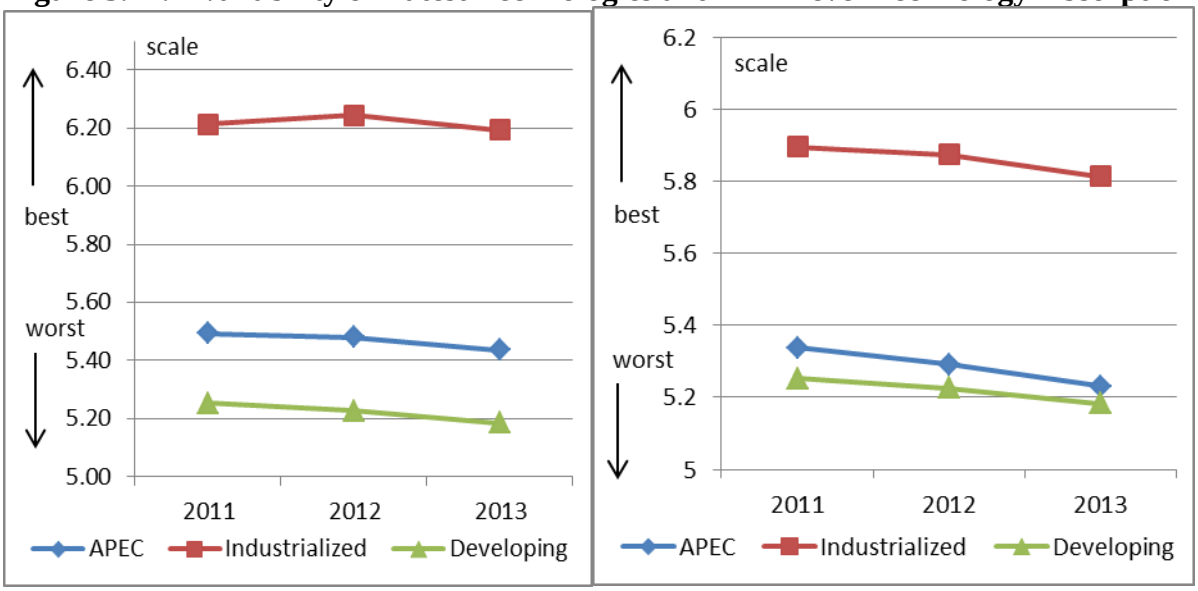
Source: StatsAPEC and International Telecommunication Union (ITU). APEC Secretariat, Policy Support Unit calculations.

[89] Based on the sub-index "Households with a personal computer" under pillar 6 of World Economic Forum's Network Readiness Index

Nevertheless, despite improving ICT infrastructure, the perception on the general business and innovation environment towards ICT seems to be less sanguine based on data from the most recent three years. Based on a sub-index of World Economic Forum's Networked Readiness Index, experts surveyed on the matter consider that the availability of latest technologies has decreased slightly. APEC-industrialized economies in general have more advanced technologies than APEC-developing economies as shown in Figure 3.71. However, both groups have seen a decreased availability of latest technologies between 2011 and 2013.

Similarly, another sub-index tracking the extent that businesses adopt new technology revealed a similar negative trend. Firms in APEC-developing were slower to adopt new technologies than firms in APEC-industrialized economies. Also, firms in both groups are finding more difficulty to absorb technology. Issues related to affordability of new technologies and IPR matters may be factors behind these trends.

Figure 3.71: Availability of Latest Technologies and Firm-level Technology Absorption



Source: World Economic Forum – Networked Readiness Index. APEC Secretariat, Policy Support Unit staff calculations.

As APEC-developing economies adapt to a more technology-savvy environment, it is important to keep political and regulatory matters on the same pace. Based on data from the most recent three years, the average software piracy rate in APEC-developing economies was more than three times higher than that of APEC-industrialized economies. Similarly, APEC-developing economies also had weaker laws relating to the use ICTs, despite a mildly improved trend.[90] In order to encourage innovation, it will be vital to have a comprehensive regulatory and legal framework to settle disputes and to safeguard intellectual property.

3.5.6 Mobile Phone Subscriptions

The level of mobile phone subscriptions in APEC economies has almost reached universal coverage. By 2013, almost all APEC economies reached levels nearing or over 100 percent of the population. As a region, APEC mobile phone subscriptions grew from 42 to 102 (per 100

[90] Based on the sub-index "Software piracy rate" and "Laws relating to ICTs" under pillar 1 of World Economic Forum's Network Readiness Index

people) from 2005 to 2013. In other words, some people in the APEC region had more than one mobile phone subscription.

Table 3.37: Mobile phone subscriptions per 100 people

	2005	2013	Average Growth p.a.
Australia	89.8	106.8	2.2%
Brunei Darussalam	63.3	112.2	7.4%
Canada	52.8	78.4	5.1%
Chile	64.7	134.3	9.6%
China	29.8	88.7	14.6%
Hong Kong, China	123.9	238.7	8.5%
Indonesia	20.9	121.5	24.6%
Japan	76.0	115.2	5.3%
Korea	81.5	111.0	3.9%
Malaysia	75.6	144.7	8.4%
Mexico	42.6	85.8	9.2%
New Zealand	85.4	105.8	2.7%
Papua New Guinea	1.2	41.0	55.0%
Peru	20.1	98.1	21.9%
Philippines	40.5	104.5	12.6%
Russia	83.4	152.8	7.9%
Singapore	97.5	155.6	6.0%
Chinese Taipei	97.5	127.5	3.4%
Thailand	46.5	138.0	14.6%
United States	68.3	95.5	4.3%
Viet Nam	11.3	130.9	35.8%
APEC	**42.4**	**102.0**	**11.6%**
Industrialised	**70.4**	**99.9**	**4.5%**
Developing	**36.2**	**102.4**	**13.9%**

Source: World Bank – World Development Indicators (WDI) and International Telecommunication Union (ITU). APEC Secretariat, Policy Support Unit calculations.

Based on UNCTAD data, the world trade of information and communication technology (ICT) goods was close to $2 trillion in 2012, with products such as mobile phones, smartphones, laptops, tablets, integrated circuits and other components explaining around 11 per cent of world merchandise trade[91] (UNCTAD 2014).

Productivity improvements could be achieved through the use of mobile phone technology and platforms. Mobile technology could help Micro and Small Enterprises to become more productive, for instance by improving sales, marketing and procurement processes (Donner and Escobari, 2010)[92]. In addition, mobile technology could help users accessing to financial services, by transferring money and obtain microfinance services, in a quick and safe manner.

[91] UNCTAD (2014), "Global imports of information technology goods approach $2 trillion", 11 February, http://unctad.org/en/pages/newsdetails.aspx?OriginalVersionID=692

[92] Donner, Jonathan and Escobari, Marcela X (2010). "A review of evidence on mobile use by micro and small enterprises in developing countries", *Journal of International Development*.

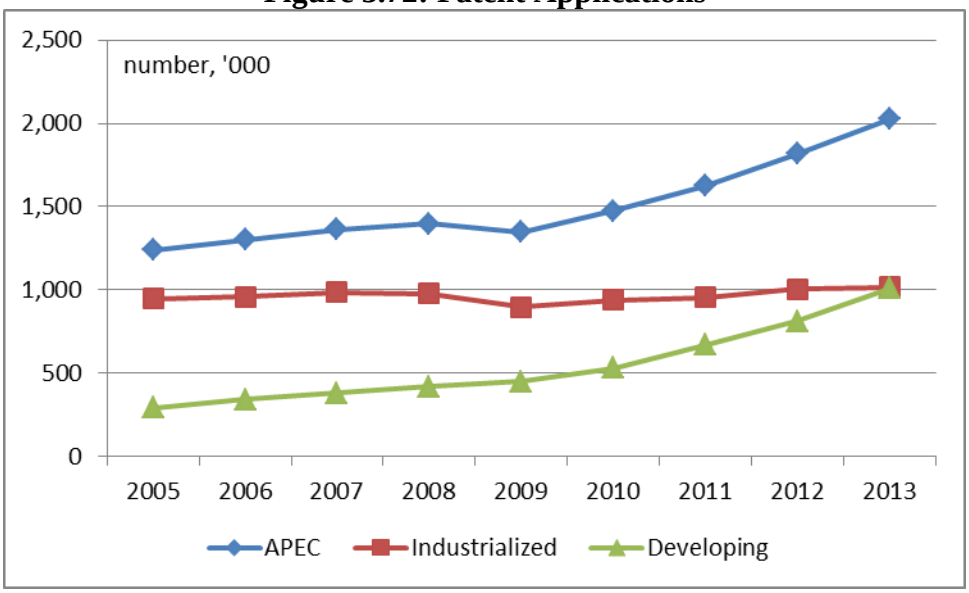
This could be particularly useful in remote areas with limited access to traditional financial services[93].

3.5.7 Intellectual Property

Under APEC's knowledge-based economy agenda, economies strive to improve their innovative growth by adopting policies and regulations to foster innovation. Maintaining a sound and balanced intellectual property system to protect and enforce intellectual property rights is vital to encourage creativity and innovation.

Patent applications filled by APEC economies' citizens grew at an average 6.3 percent per year during 2005 to 2013. Figure 3.72 shows that the growth in patent applications intensified significantly after 2009, mainly supported by more patent applications filed in APEC-developing economies.

Figure 3.72: Patent Applications



Source: WIPO Statistics Database and APEC Secretariat, Policy Support Unit staff calculations.

Patents applications in APEC economies constituted 73 percent and 77 percent of the total global patent applications in 2005 and 2013 respectively. For the number of patents in force, APEC patents constituted 77 percent and 79 percent of global patents in force in 2005 and 2013, respectively.

Table 3.38: Total patent applications (direct and PCT national phase entries) and patents in force

	Patent applications		Patents in force	
	2005	**2013**	**2005**	**2013**
Australia	10,681	12,515	24,971	42,962
Brunei Darussalam	2	19	-	71
Canada	20,190	26,304	57,539	96,129

[93] Jack, William and Tavneet Suri (2010), "The Economics of M-PESA", p. 2, 19. http://www.mit.edu/~tavneet/M-PESA.pdf

Chile	449	805	146	1,642
China	97,948	734,081	59,179	622,084
Hong Kong, China	1,101	1,743	1,978	5,269
Indonesia	256	755	66	941
Japan	530,005	473,137	1,623,227	2,546,907
Korea	162,694	223,517	353,584	756,881
Malaysia	921	2,299	440	4,447
Mexico	927	2,139	1,998	4,694
New Zealand	3,239	3,450	5,608	5,312
Papua New Guinea	-	1	1	4
Peru	33	97	85	122
Philippines	280	350	121	408
Russia	25,948	34,065	100,000	139,572
Singapore	1,899	5,470	2,669	13,331
Thailand	1,000	1,911	172	2,344
United States	383,242	501,128	1,244,371	1,828,331
Viet Nam	183	497	6	437
APEC	**1,240,998**	**2,024,283**	**3,476,161**	**6,071,888**
% of world	**73%**	**77%**	**77%**	**79%**

Source: WIPO Statistics Database and APEC Secretariat, Policy Support Unit calculations.

At the individual economy level, China leapfrogged industrialized economies and emerged as the top economy in APEC, accounting for more than one-third of total patent applications in 2013. Half of the APEC-developing economies posted double-digit annual growth rates in filing patent applications during the same period. Only one economy in APEC filed less patent in 2013 compared to 2005.

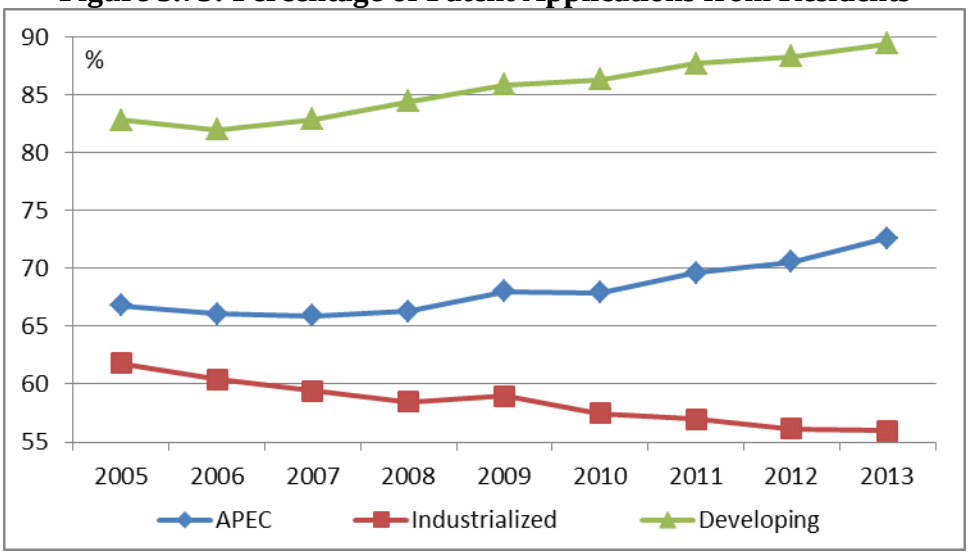
Table 3.39: Top 5 APEC Economies with Most Patent Applications (Share within APEC)

2005		2013	
Japan	42.7	China	36.3
United States	30.9	United States	24.8
Korea	13.1	Japan	23.4
China	7.9	Korea	11.0
Russia	2.1	Russia	1.7

Source: WIPO Statistics Database and APEC Secretariat, Policy Support Unit staff calculations.

The examination of patent applications by place of residency revealed interesting information. Figure 3.73 shows an upward trend in the participation of local residents in filing patent applications in APEC-developing economies. More than 80 percent of those patent applications came from local residents in the period 2005-2013. On the other hand, for APEC-industrialized economies, around 55 percent of patent applications were filed by local residents in 2013, showing a marked decline in the percentage of patent applications by local residents since 2005.

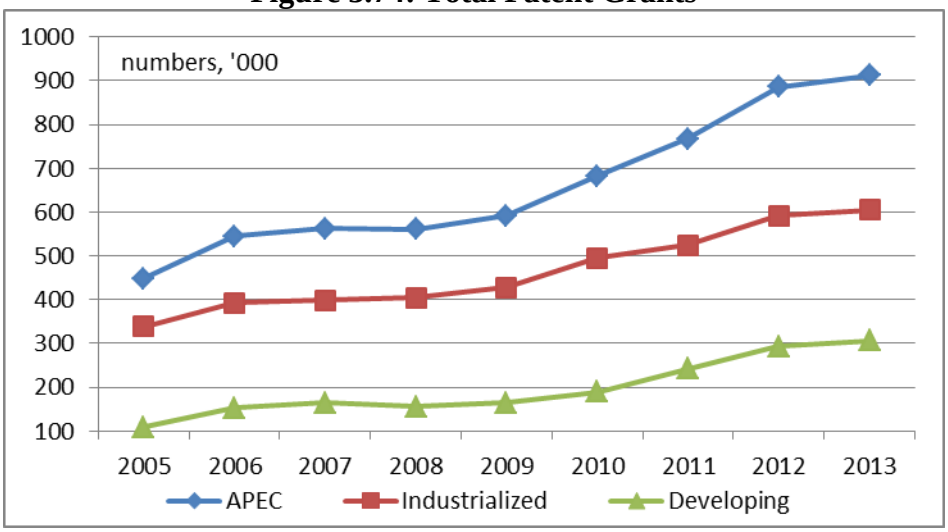
Figure 3.73: Percentage of Patent Applications from Residents



Source: WIPO Statistics Database. APEC Secretariat, Policy Support Unit staff calculations.

Despite catching up with APEC-industrialized economies in patent applications, the number of patents granted to APEC-developing economies was lower than those to APEC-industrialized economies (Figure 3.74). In addition, the percentage of patents granted to APEC-developing economies was about 30 percent, a low figure in comparison to APEC-industrialized economies, with a percentage of patents granted equivalent to 59 percent as of 2013. Japan and the United States have consistently been the two top economies with the most patent grants (37.3 percent and 26.8 percent of the patents granted in APEC in 2013, respectively); while China's share in APEC surged from 4.8 percent in 2005 to 17.0 percent in 2013.

Figure 3.74: Total Patent Grants



Source: WIPO Statistics Database. APEC Secretariat, Policy Support Unit staff calculations.

In order to determine how much APEC economies have been protecting intellectual property rights (IPR), Table 3.40 shows the values of the Property Rights Alliance's International Property Rights Index in APEC[94], which attempts to measure the importance given to property

[94] The International Property Rights Index consists of 10 variables, focusing on three areas: Legal and Political Environment (judicial independence, confidence in the courts, political stability, and corruption); Physical Property Rights (protection of property rights, property records, and access to credit); Intellectual Property Rights

rights and how they protect economic welfare. APEC average scores are higher than the world average, which indicate a stronger level of IPR protection. APEC's score in Physical Property Rights (PPR) is much higher compared with the other two categories: Legal and Political Environment (LP) and Intellectual Property Rights (IPR). Within APEC, the industrialized economies obtained higher scores in comparison with developing economies.

Table 3.40: International Property Rights Index, 2013, APEC Economies

Economy	IPRI	LP	PPR	IPR
Australia	7.9	8.3	7.4	7.9
Brunei Darussalam	5.7	7.0	5.4	4.6
Canada	8.0	8.4	7.6	8.1
Chile	6.8	7.4	7.1	5.9
China	5.5	4.3	6.8	5.4
Hong Kong, China	7.7	8.1	7.9	7.1
Indonesia	4.9	4.0	6.7	4.1
Japan	7.7	7.7	7.2	8.3
Korea, Republic	6.4	5.9	6.2	7
Malaysia	6.5	5.7	7.7	6.1
Mexico	5.2	4.2	5.8	5.7
New Zealand	8.4	8.9	8.2	8.2
Peru	5.0	3.9	6.6	4.5
Philippines	5.0	3.5	6.1	5.3
Russia	4.5	3.3	5.4	4.9
Singapore	8.1	8.3	8.2	7.9
Chinese Taipei	7.2	6.8	7.8	7.1
Thailand	5.1	4.4	6.7	4.2
United States	7.6	7.2	7.2	8.3
Vietnam	4.7	4.5	5.7	3.9
APEC average	**6.4**	**6.1**	**6.9**	**6.2**
Industrialised	**7.9**	**8.1**	**7.5**	**8.2**
Developing	**5.9**	**5.4**	**6.7**	**5.6**
World average	6.0	5.7	6.5	5.9

Source: Property Rights Alliance. APEC Secretariat, Policy Support Unit staff calculation.

On the differential of scores between APEC-industrialized and developing economies, it can be inferred from Di Lorenzo (2013)[95] that the difference in protection of innovation and knowledge between both groups, generates implications for multinational firms willing to invest in those places in which IPR is low (or lower). Places with more developed and sophisticated property right protection systems, like those in most developed economies, enjoy more enhancing dynamic and innovative competitive environments, and are able to attract more investments.

(protection of IP, strength of patents, and copyright piracy). The scale of total classification of IPRI ranges from 0 to 10, where 10 stands for the strongest level of protection of property rights and 0 represents a lack of security regarding an economy's property rights.

[95] Di Lorenzo, Francesco (2013). "International Property Rights Index: 2013", p. 30, http://www.propertyrightsalliance.org/userfiles/2013%20International%20Property%20Rights%20Index-PRA.pdf

An efficient and clear property rights system is crucial for creating creative and innovative environment. The International Chamber of Commerce (2005) highlighted that good intellectual property rights system will encourage innovation and creativity by providing incentives to innovators to produce new inventions and creations; stimulate the development of vibrant local cultures, encourage their dissemination worldwide; and allow innovators, creators and producers to finance their work through the market place.[96]

3.5.8 Contribution of ISO Members' Bodies to the Standards Process

Standards play an important role in business activities, including SMEs. APEC economies have played an active role in supporting the process of aligning domestic standards to international standards, by following guidelines of the International Standardization Organization (ISO), International Electrotechnical Commission (IEC) and Codex Alimentarius, among others. In addition, initiatives related to harmonization, equivalence and mutual recognition have been reported, as well as the recognition of more conformity assessment bodies in some APEC economies[97].

APEC economies have been participating actively in the ISO. APEC economies provided 42 percent and 43 percent of the total number of ISO technical secretariats and convenorships globally in 2013. APEC-industrialised economies contributed with 72 percent of the technical secretariats and 83 percent of convenorships.

Table 3.41: Contribution of ISO member bodies to the standards process, APEC economies, 2013

Economy	Number of secretariats	Number of convenorships
Australia	22	74
Canada	16	84
China	54	86
Indonesia	0	1
Japan	70	205
Korea	19	78
Malaysia	5	6
Mexico	0	2
New Zealand	0	5
Economy	**Number of secretariats**	**Number of convenorships**
Philippines	0	1
Russia	9	6
Singapore	0	2
Thailand	1	6
United States	117	531

[96] International Chamber of Commerce (2005). "Intellectual Property: Source of innovation, creativity, growth and progress"; p. 8-9, http://www.iccwbo.org/advocacy-codes-and-rules/bascap/value-of-ip/innovation,-creativity,-growth-and-progress/

[97] APEC Policy Support Unit (2014), "APEC's Bogor Goals Progress Report 2014", p. 5, http://publications.apec.org/publication-detail.php?pub_id=1564

APEC	**313**	**1087**
Industrialised	**225**	**899**
Developing	**88**	**188**
APEC share of World	**42%**	**43%**

Source: ISO in figures, International Standardization Organization. APEC Secretariat, Policy Support Unit staff calculations.

Unfortunately, the statistical information available in international standards bodies cannot provide an idea of the impact of the international standards and the alignment of domestic standards with international standards on economic growth and innovation. According to the OECD, technical regulations could have positive and negative effects. On the one hand, they can place technical demands on industries and can trigger the creation of new industries and products. On the other hand, they can erect barriers to the development of new products and could discourage research efforts by distorting the choice of technology to be explored and adopted and by increasing the cost of the development process[98]. However, WTO mentions that harmonization and mutual recognition of standards are ways in which negative effects of technical regulations can be mitigated. In fact, according to WTO, harmonization of standards can enhance the presence of SMEs in export markets[99].

3.6 SECURE GROWTH

APEC's economic growth faced many threats over the past decade, from the global financial crisis and incidents of terrorism to extreme weather events and natural disasters. However, APEC economies have also proved resilient during this time, growing an average of 2.8 percent annually over 2005-2013 (compared with 2.2 percent average annual growth for the rest of the world). In order to sustain economic growth and development, APEC economies need to implement policies that will increase their resilience to future shocks. Policies that mitigate the risks from man-made calamities, natural disasters, infectious diseases, food insecurity, and weak governance need to be formulated and implemented. Moreover, as many of these risks are borderless and transnational in nature, regional cooperation will be needed to ensure that measures are coordinated to minimise risk.

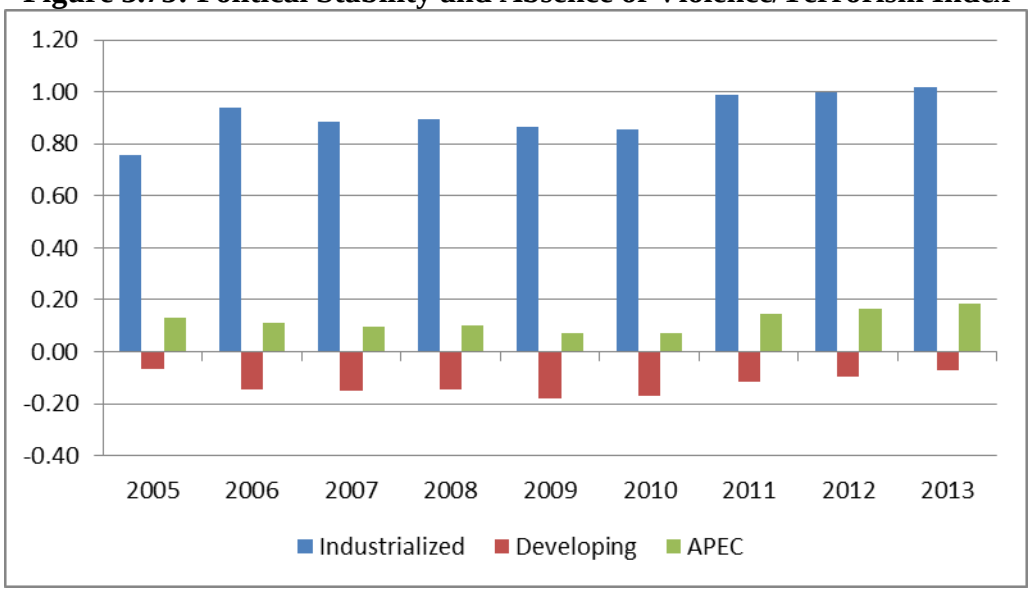
3.6.1 Protection from Violent Disruptions and Misuse

A key source of insecurity for any economy is the potential for crime, social unrest, or terrorist activity. Securing the peace requires a stable political situation that can ensure law enforcement and institutional consistency. Conversely, episodes of coups, revolt, or terrorism undermine political stability in an economy. Based on World Bank's World Governance Indicators (WGI), APEC industrialized economies are seen as significantly more stable and free of violence than developing economies. As can be seen in Figure 3.75, on a scale of -2.5 (high likelihood of violence/instability) to 2.5 (low likelihood), industrialized APEC economies score around one on average while developing economies have an average score below zero. In 2013, eight APEC economies scored negative in the WGI index for Political Stability and Absence of

[98] OECD (undated), "Regulatory Reform and Innovation", p.12, http://www.oecd.org/sti/inno/2102514.pdf
[99] WTO (2012), "World Trade Report 2012 - Trade and Public Policies: A Closer Look at Non-Tariff Measures in the 21st Century", p. 153.

Violence/Terrorism[100]. Negative perceptions on political stability can affect investment, trade, and planning decisions by firms and households.

Figure 3.75: Political Stability and Absence of Violence/Terrorism Index

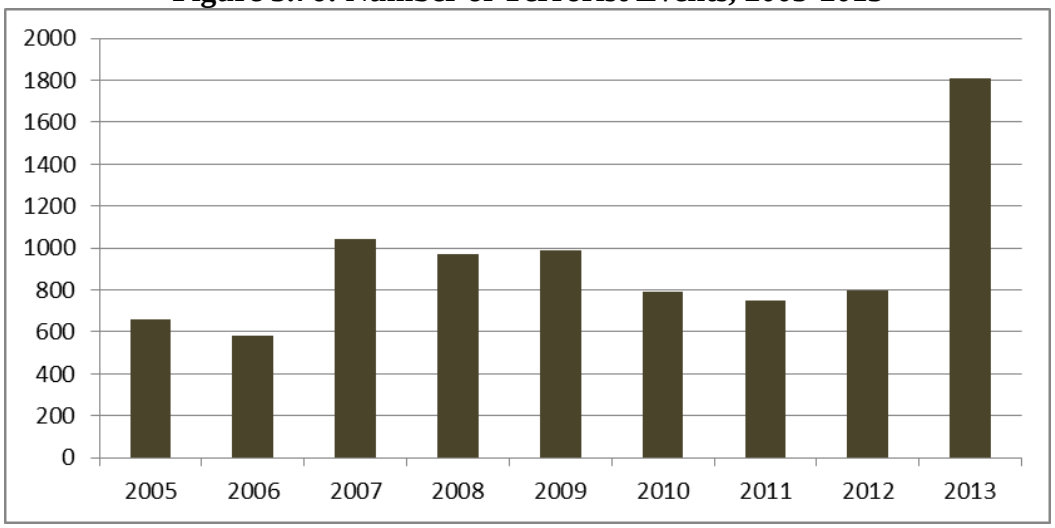


Note: This index reflects perceptions of the likelihood that the government will be destabilized or overthrown by unconstitutional or violent means, including politically-motivated violence and terrorism. Index ranges from -2.5 (high likelihood of violence/instability) to 2.5 (low likelihood).
Source: World Governance Indicators data. APEC Secretariat, Policy Support Unit calculations

Developing economies are also more likely than industrialized economies to experience terrorist events (Figure 3.76). Of the 780 terrorist events recorded by the Global Terrorism Database (GTD) in 2013, 764 occurred in developing economies and 16 in industrialized economies. Terrorism also has a significant human cost, with 1,810 people in APEC economies either injured or killed due to terrorism events in 2013. APEC economies, in general, need to halt the rising trend of terrorism events in the region and address the root causes of social unrest and insurgency. It is worth noting, however, that the APEC region is still relatively safer than the rest of the world: although the region is home to about 40 percent of the world's population, it only experienced 13 percent of the world's terrorist events and six percent of casualties in 2013.

[100] As perceptions are based on recent historical events and precedent, these perceptions may or may not have bearing on the current level of political stability.

Figure 3.76: Number of Terrorist Events, 2005-2013



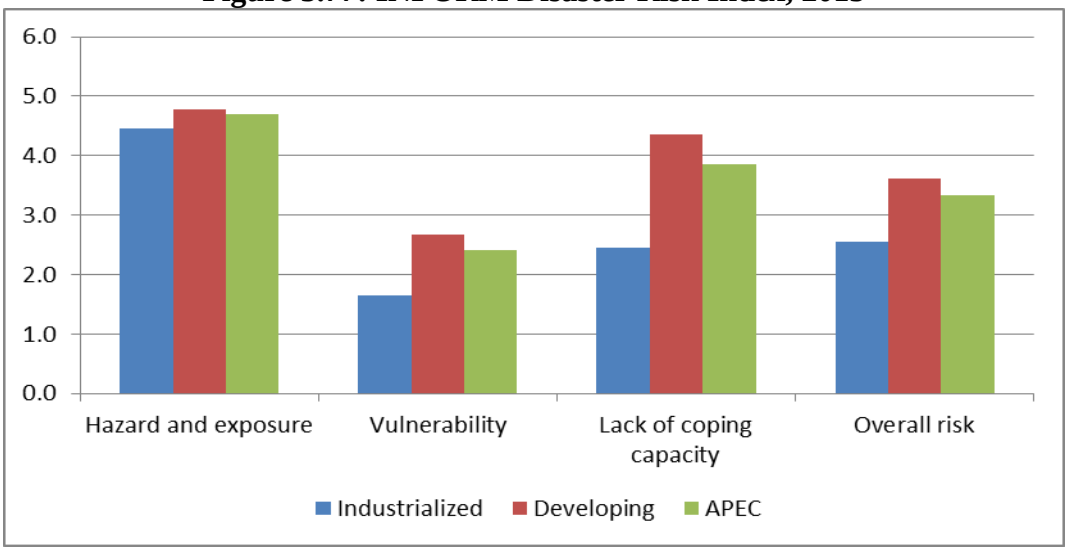
Note: The Global Terrorism Database defines a terrorist attack as "the threatened or actual use of illegal force and violence by a non-state actor to attain a political, economic, religious, or social goal through fear, coercion, or intimidation".
Source: Global Terrorism Database. APEC Secretariat, Policy Support Unit calculations.

3.6.2 Disaster Preparedness and Resilience of Infrastructure

While all economies face some risk of natural or man-made disaster, the risk of damage and casualties as well as the eventual cost of such disasters is closely related to the exposure to potential disasters and the population's vulnerability due to factors such as poverty, lack of access to basic services and the economy's capability to cope with disasters. Figure 3.77 shows the disaster risk index scores developed by the Inter-Agency Standing Committee (IASC) Task Team for Preparedness and Resilience and the European Commission (EC). It shows that, overall, developing economies face more disaster risks than industrialized economies.

A look at the sub-indices, however, yields important insights. While there is just a small gap between industrialized and developing economies in terms of hazard and exposure to disaster risk, there are large gaps in terms of the population's vulnerability and capacity to cope with disasters. Exposure to natural disasters is an accident of geography, and there is little an economy can do to change their risk profile to extreme weather or seismic events. However, there is much APEC economies can do to reduce the vulnerabilities of their populations and increase their capacity to cope with disasters. For example, developing economies need technical assistance and financial capacity to improve their ability to prepare for and cope with disasters. They will also need inclusive growth and stronger safety nets to reduce their populations' vulnerability (see section 3 on inclusive growth).

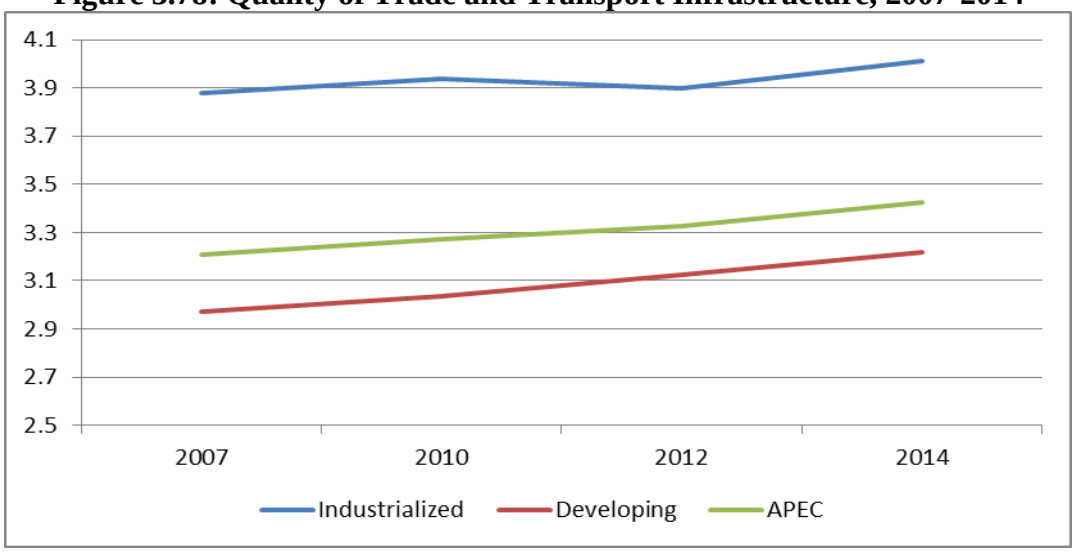
Figure 3.77: INFORM Disaster Risk Index, 2015



Note: The risk index is taken from the Index or Risk Management (INFORM) developed by the IASC Task Team for Preparedness and Resilience and the EC. The disaster risk index incorporates data for 21 indicators covering (1) hazard and exposure to natural and man-made risks, (2) socioeconomic vulnerability and vulnerable groups, and (3) lack of coping capacity. Scores range from 0 (no risk) to 10 (high risk). No INFORM scores for Hong Kong, China and Chinese Taipei.
Source: Index for Risk Management (INFORM) http://www.inform-index.org/. APEC Secretariat, Policy Support Unit calculations.

In events of natural or man-made calamities, it is important to ensure that essential infrastructure for transportation and trade remain viable in order to facilitate the transport of relief goods, equipment, and personnel. It is thus essential to maintain high quality infrastructure to ensure that services are not completely disrupted in times of emergencies. As can be seen in Figure 3.78, industrialized economies generally do better than developing economies in terms of overall quality of trade and transport infrastructure, although scores have been improving over time especially among developing economies.

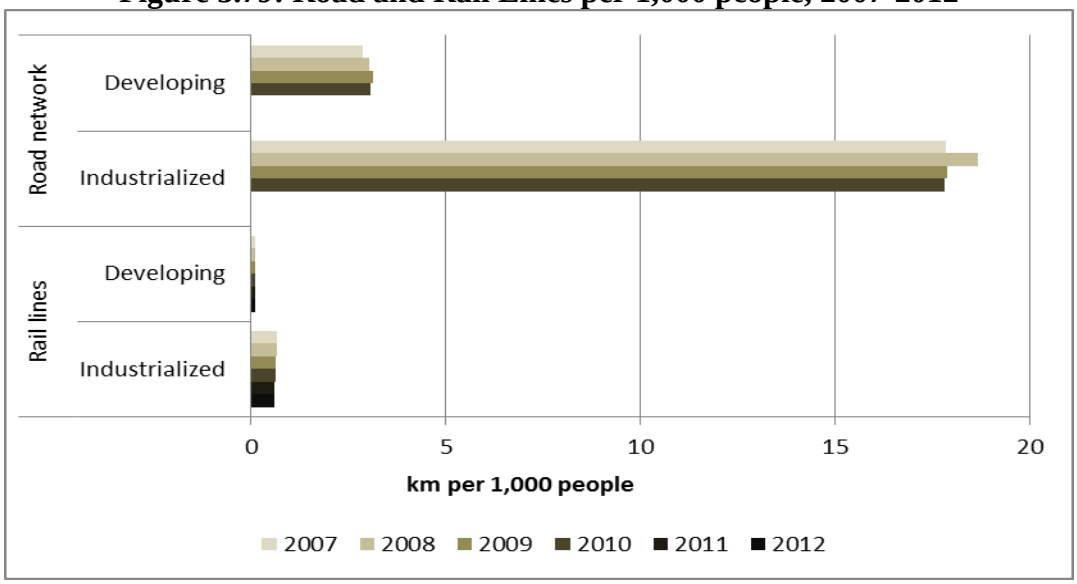
Figure 3.78: Quality of Trade and Transport Infrastructure, 2007-2014



Note: The index measures the quality of trade and transport-related infrastructure, ranging from 1 to 5 (best). Chinese Taipei data is not available.
Source: World Bank's Logistics Performance Index data. APEC Secretariat, Policy Support Unit calculations.

Transport infrastructure capacity is also much higher in industrialized economies than in developing economies (Figure 3.79). In 2012, the density of rails was equivalent to 0.6 kilometres of rail lines per 1,000 people in industrialized economies and 0.1 kilometres per 1,000 people in developing economies. Meanwhile, in 2010, industrialized economies had 17.8 kilometres of roads per 1,000 people as opposed to 3.1 kilometres in developing economies.

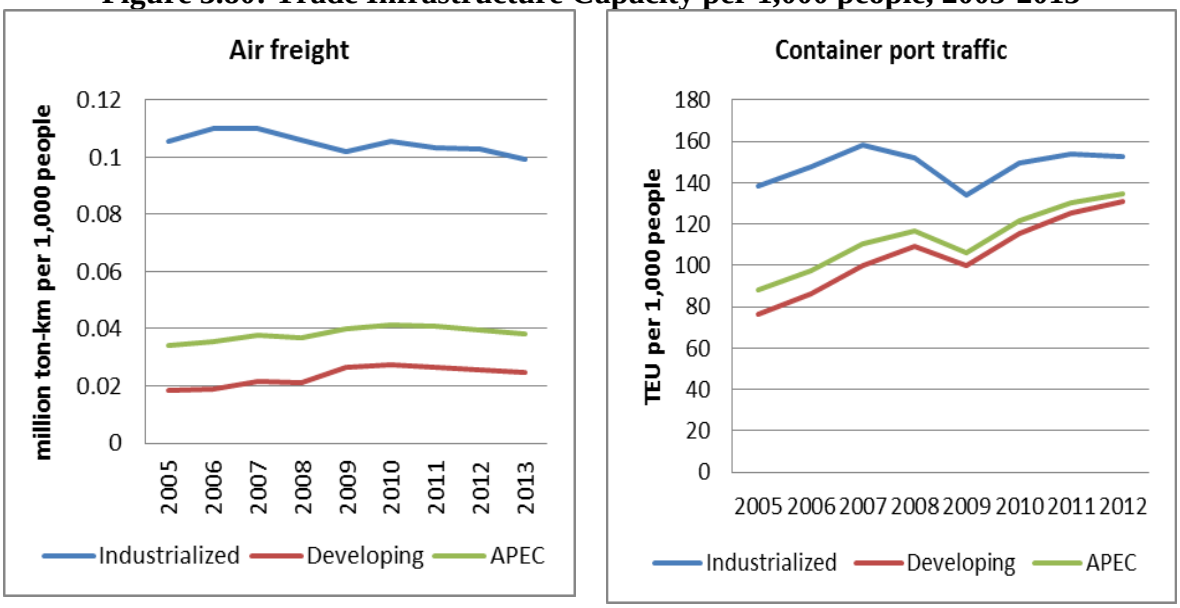
Figure 3.79: Road and Rail Lines per 1,000 people, 2007-2012



Source: World Development Indicators. APEC Secretariat, Policy Support Unit calculations.

Likewise, trade infrastructure capacity remains significantly higher in industrialized economies (Figure 3.80). Air freight traffic in industrialized economies has been more than four times higher than that in developing economies, and there has been no indication that the gap is getting smaller. On the other hand, the gap between industrialized and developing economies in container port traffic capacity narrowed between 2005 and 2012.

Figure 3.80: Trade Infrastructure Capacity per 1,000 people, 2005-2013

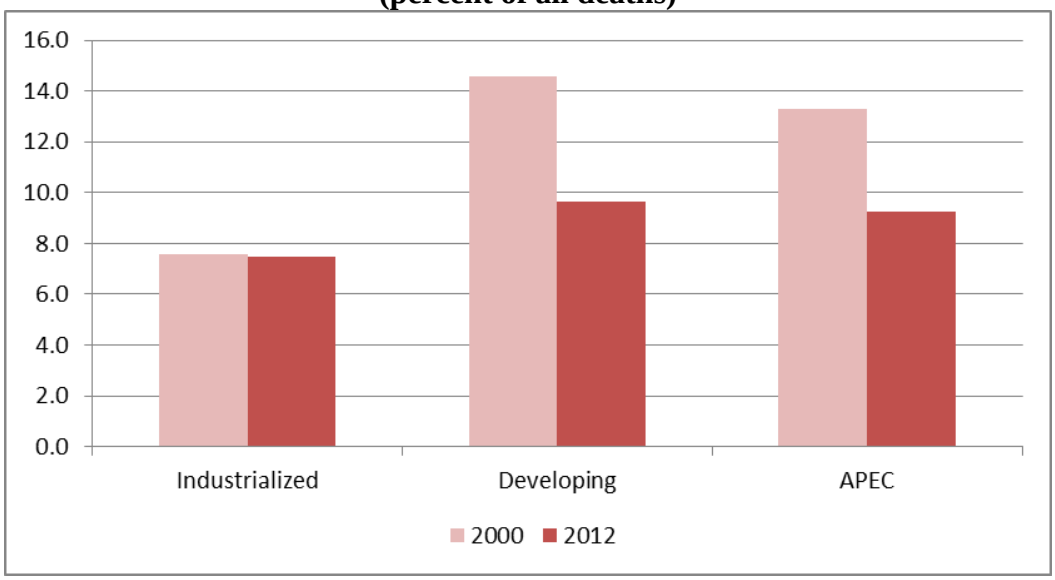


Note: TEU = 20-foot equivalent unit. Data excludes Chinese Taipei.
Source: World Development Indicators. APEC Secretariat, Policy Support Unit calculations.

3.6.3 Strengthening Healthcare Systems

Secure growth also requires the strengthening of healthcare systems to mitigate risks to public health such as communicable diseases or malnutrition. As of 2012, 9.3 percent of all deaths in APEC economies were due to communicable diseases, pregnancy, or nutritional conditions. These deaths include those from infectious and parasitic diseases, respiratory infections, nutritional deficiencies such as underweight and stunting, and lack of maternal or prenatal healthcare. As can be seen in Figure 3.81, the rate for these types of deaths is significantly higher for developing economies than industrialized economies. However, it is positive that the gap has been going down between 2000 and 2012, with the rate in developing economies falling from 14.6 percent to 9.6 percent during the period. These deaths could be prevented by strengthening public health systems that provide access to basic healthcare services while maintaining effective referral mechanisms for monitoring and surveillance of communicable diseases.

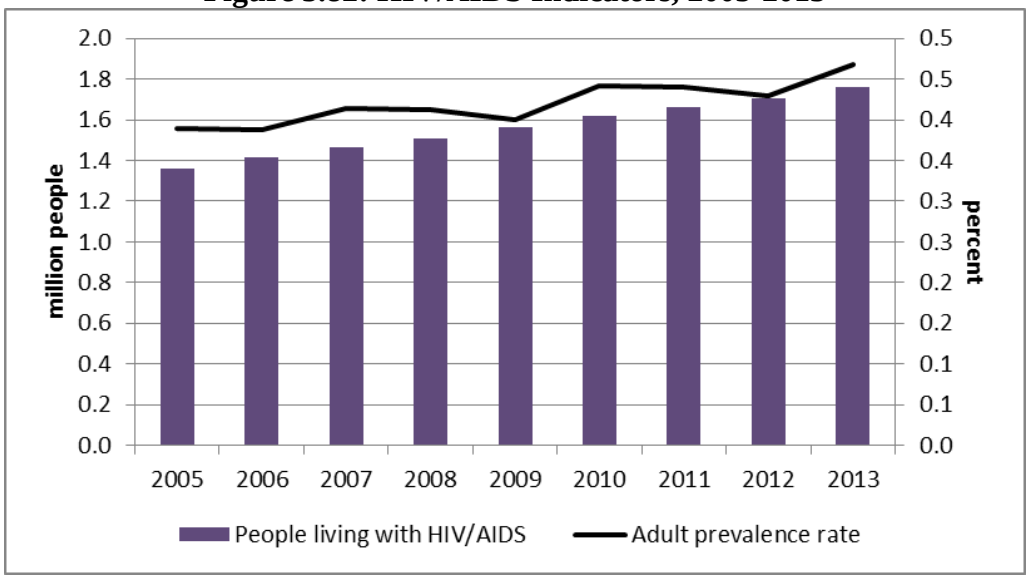
Figure 3.81: Cause of Death by Communicable Diseases and Maternal, Prenatal, and Nutritional Conditions (percent of all deaths)



Source: World Development Indicators. APEC Secretariat, Policy Support Unit calculations.

On the other hand, the adult HIV/AIDS rate in the APEC region has been on an upward trend between 2005 and 2013 (Figure 3.82). Among the nine APEC economies for which data are available, the number of people living with HIV/AIDS has increased from 1.4 million in 2005 to 1.8 million in 2013, with HIV/AIDS cases growing at an average rate of 3.3 percent annually during the period. The proportion of adults living with HIV/AIDS has also slightly increased during the period, from 0.39 percent in 2005 to 0.47 percent in 2013. Although the prevalent rates are still low for the region, the rising trend should be a cause for concern as they are indicative of an inability to reach certain populations for preventive education.

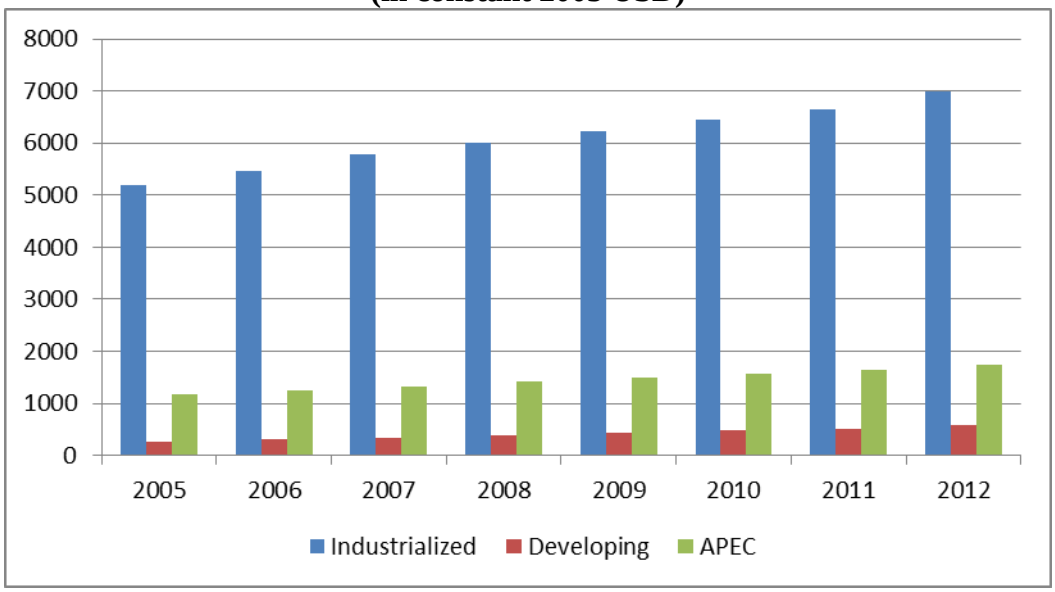
Figure 3.82: HIV/AIDS Indicators, 2005-2013



Note: Data only cover Australia; Chile; Indonesia; Malaysia; Mexico; Papua New Guinea; Peru; Thailand; and Viet Nam.
Source: World Development Indicators and UNAIDS. APEC Secretariat, Policy Support Unit calculations.

Healthcare spending, which gives an indication of capability to access healthcare services, varies widely between industrialized and developing economies. In this sense, healthcare spending in the former is more than 10 times higher than that for the latter (Figure 3.83). In 2012, average per capita spending on healthcare in industrialized economies was USD 6,990 (in constant 2005 dollars), while in developing economies, it was only USD 571. On the other hand, the growth rate in per capita healthcare spending in developing economies is more than double that of industrialized economies. In the period 2005-2012, per capita healthcare spending in developing economies grew an average of 11.5 percent per year, compared with 4.4 percent annual growth in industrialized economies.

Figure 3.83: Health Expenditure per capita, 2005-2012
(in constant 2005 USD)



Source: World Bank – World Development Indicators. APEC Secretariat, Policy Support Unit calculations.

There is also a wide disparity in the capacity of healthcare services across APEC economies. Table 3.42 lists the number of available hospital beds and physicians per 1,000 people in the region. Among APEC economies with available data, Japan and Russia have the highest available healthcare capacity in terms of hospital beds and physicians. On the other hand, for some developing economies, the capacity for hospital beds is low, as well as the ratio between physicians and the population.

Table 3.42: Healthcare capacity indicators, 2006-2012

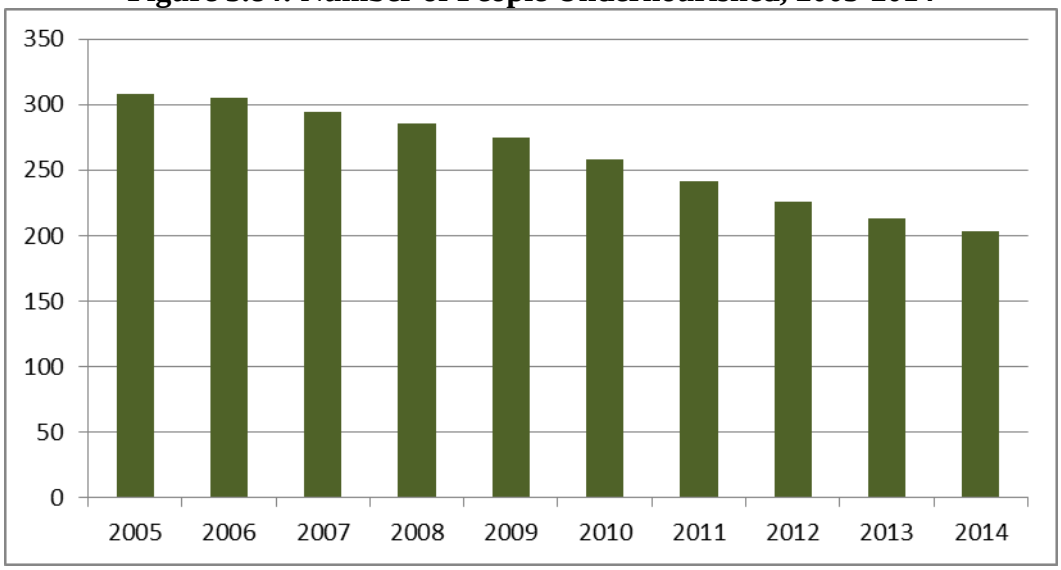
	Hospital beds per 1,000 people		Physicians per 1,000 people	
	2004-2006	2010-2012	2004-2006	2010-2012
Australia	4.0	3.9	1.0	3.3
Brunei Darussalam	2.8	2.8	n.a.	1.5
Canada	3.4	2.7	1.9	2.1
Chile	2.3	2.1	1.3	1.0
China	2.2	3.8	1.6	1.9
Hong Kong, China	n.a.	n.a.	n.a.	n.a.
Indonesia	n.a.	0.9	0.1	0.2
Japan	14.0	13.7	2.1	2.3
Korea	8.6	10.3	1.7.	2.1
Malaysia	1.9	1.9	n.a.	1.2
Mexico	1.6	1.5	2.9	2.1
New Zealand	n.a.	2.3	n.a.	2.7
Papua New Guinea	n.a.	n.a.	n.a.	0.1
Peru	1.2	1.5	n.a.	1.1
The Philippines	0.5	1.0	1.1	n.a.
Russia	9.7	9.7	4.3	4.3
Singapore	3.2	2.0	n.a.	1.9
Chinese Taipei	n.a.	n.a.	n.a.	n.a.
Thailand	n.a.	2.1	0.3	0.4
United States	3.1	2.9	n.a.	2.5
Viet Nam	2.7	2.0	n.a.	1.2

Source: World Bank – World Development Indicators.

3.6.4 Ensuring Food Security

Apart from access to healthcare and control of communicable diseases, an essential aspect of human security is food security. Nutrition plays a key role not only in ensuring health and well-being, but also in making people productive and ensuring economic growth. Indeed, sufficient nutrition is an important determinant of education outcomes as students and workers cannot absorb skills training without proper nutrition. In the last ten years, the number of undernourished people in APEC decreased by more than 100 million, from 308.2 million in 2005 to 202.9 million in 2014 (Figure 3.84).

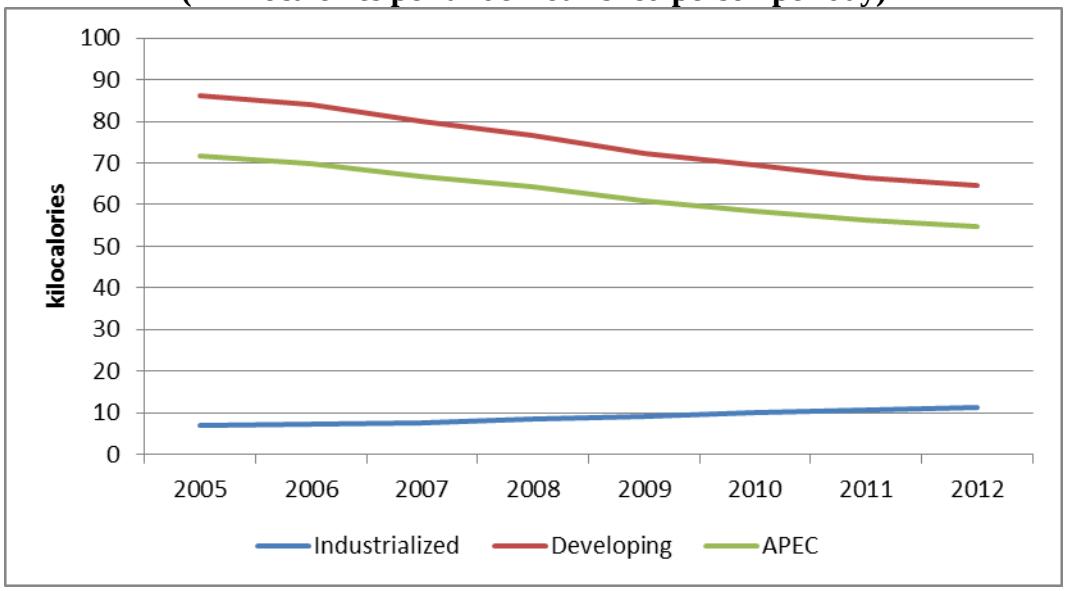
Figure 3.84: Number of People Undernourished, 2005-2014



Note: Data only cover China; Indonesia; Mexico; Peru; the Philippines; Thailand; and Viet Nam.
Source: FAO Statistics. APEC Secretariat, Policy Support Unit calculations.

Another indicator for food insecurity is the depth of undernourishment, which measures the average amount of kilocalories an undernourished person requires to achieve a healthy food intake. As can be seen in Figure 3.85, the depth of undernourishment is significantly more severe in developing economies than industrialized economies. However, the depth of undernourishment in developing economies has been steadily going down between 2005 and 2012, while it has been inching upward in industrialized economies.

Figure 3.85: Depth of Food Deficit, 2005-2012
(in kilocalories per undernourished person per day)

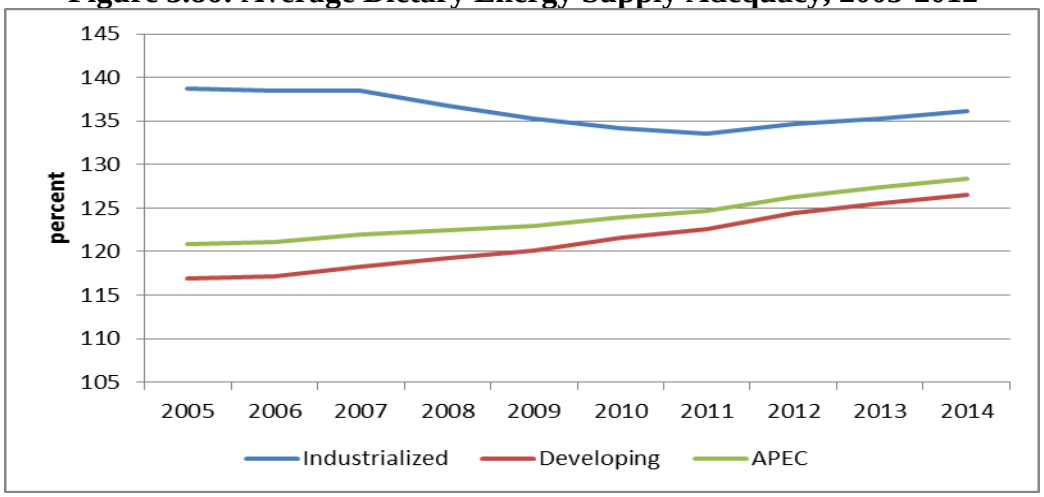


Note: The deficit measures the number of kilocalories required to lift a person out of undernourishment.
Source: World Development Indicators. APEC Secretariat, Policy Support Unit calculations.

In general, APEC economies have adequate food supplies to meet their populations' food requirements. Figure 3.86 shows that APEC's access to food is equivalent to more than 100 percent of the dietary requirements for its population. As expected, there is more food abundance in industrialized economies than developing economies. However, food abundance

has been steadily increasing in developing economies. It is important to note that food could be abundant without eliminating undernourishment. For example, a percentage of the population might not have access to enough food, or they might have access to an imbalanced diet to nourish them properly.

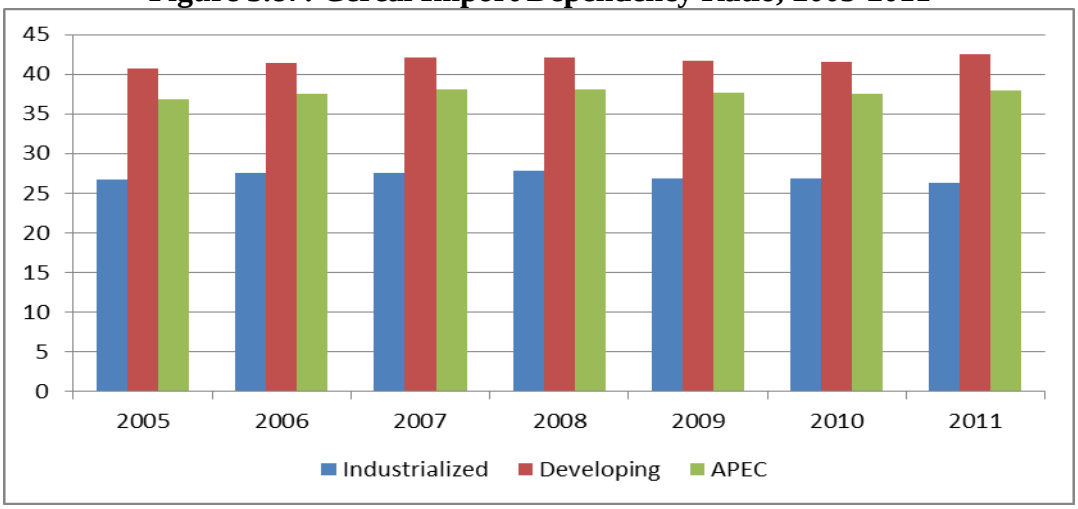
Figure 3.86: Average Dietary Energy Supply Adequacy, 2005-2012



Note: This indicator is the ratio of the total amount of food supply available in an economy to the total food required by the population, measured in calories. A ratio of 100 means there is adequate food supply to meet requirements.
Source: FAO Statistics. APEC Secretariat, Policy Support Unit calculations.

Cereal grains such as rice, wheat, and maize constitute an important part of people's diets, and it is essential to ensure their adequate supply in the market. While trade in agricultural products is an important aspect of food security by allowing food to move from abundant to scarce areas, overreliance on imported staples can be a source of vulnerability to external factors such as international food price volatility. Figure 3.87 shows that developing economies are generally more dependent on imported cereals than industrialized economies, importing more than 40 percent of their cereal requirements compared to less than 30% in industrialized economies. Moreover, there has been a slight upward trend in the cereal import dependency ratio of developing economies, rising from 40.7 percent in 2005 to 42.5 percent in 2011.

Figure 3.87: Cereal Import Dependency Ratio, 2005-2011



Source: FAO Statistics. APEC Secretariat, Policy Support Unit calculations.

While food self-sufficiency may not be possible for most economies due to geographic or climate factors, economies need to weigh risks to food supply arising from internal and external factors and address them. In this regard, economies need to implement economy-specific and regional policies to ensure short-term and long-term food security. Table 3.43, taken from a 2013 ADB study on food security, summarises some economy-specific and regional actions that can be taken to ensure food security.

Table 3.43: Food Security Policy Matrix

Actions	Economy	Regional/Global
Interventions to Meet Immediate Needs	Provide emergency food assistance and enhance social safety nets Offer programmed cash transfers Target interventions at nutrition	Provide timely and reliable data and information Coordinate crisis policy responses Facilitate flows of emergency assistance Reduce agricultural trade restrictions and market distortions
Actions to Improve Medium- to Long-Term Resilience	Promote agriculture and rural development: Improve rural roads and infrastructure Improve farm access to inputs Enhance farm productivity through agricultural research, extension services, and postharvest measures Invest in human development: education and health Strengthen nutrition education and awareness Consider building an emergency fund for disaster relief Introduce insurance and disaster mitigation measures, such as crop insurance and futures contracts Establish national and regional food reserves and crisis management systems	Promote research and development, knowledge exchange, and capacity building Improve monitoring and surveillance of food market conditions Promote food trade liberalization Consider mechanisms to promote price stability, such as regional and international food reserves Enhance collaboration on climate change and accelerate adaptation measures

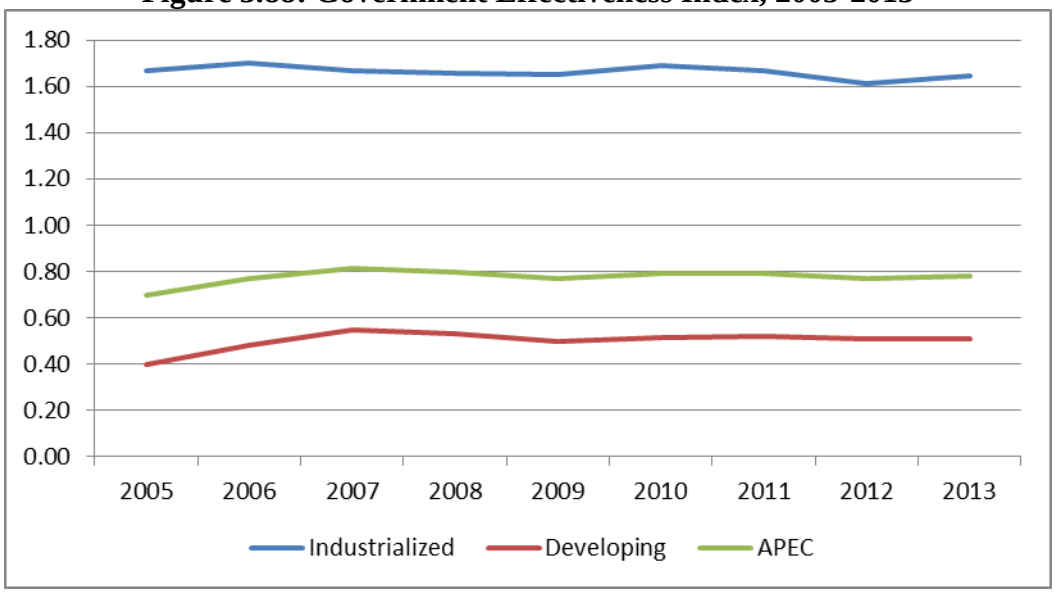
Source: ADB. 2013. Food Security in Asia and the Pacific. Mandaluyong City: ADB.

3.6.5 Improving Governance

Secure growth also hinges on the quality of governance in an economy. All previous indicators of secure growth require good governance to improve. A well-governed economy will be able to maintain peace and order, manage risks and prepare for disasters, and ensure healthcare and food security. As can be seen in Figure 3.88, based on World Bank's WGI data, governments

in industrialized economies are perceived to be more effective than those in developing economies. However, it is worth noting that perceptions on government effectiveness have been improving in developing economies on average, with 15 APEC economies scoring positively in this in index in 2013. Among APEC economies, Singapore scored highest on this indicator (2.1).

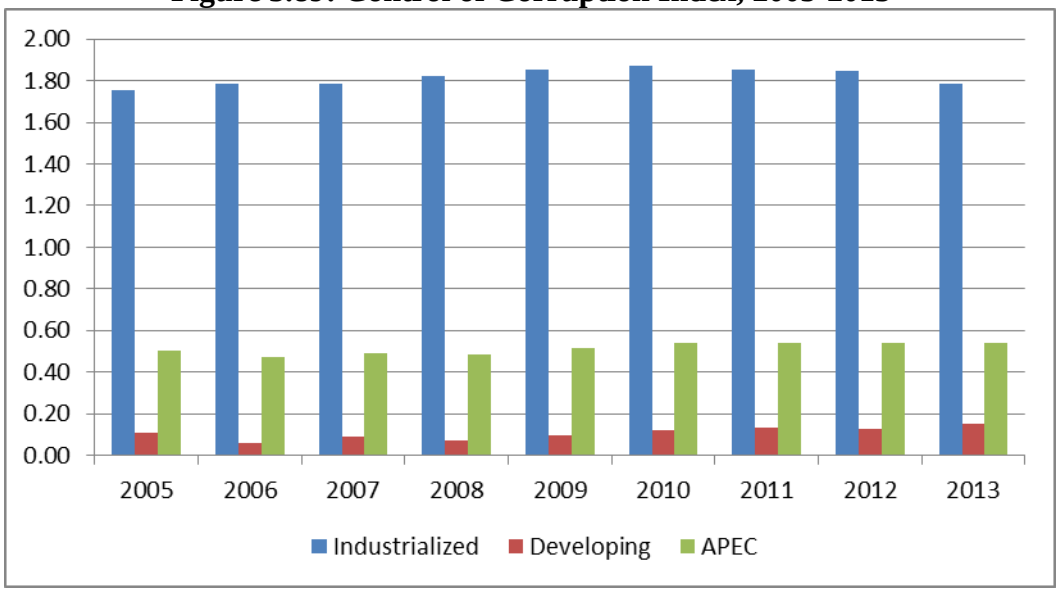
Figure 3.88: Government Effectiveness Index, 2005-2013



Note: The index reflects perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies. Index ranges from -2.5 (ineffective) to 2.5 (highly effective).
Source: World Governance Indicators data. APEC Secretariat, Policy Support Unit calculations.

Developing economies are also perceived to be less able to control corruption than industrialized economies. As can be seen in Figure 3.89, on a corruptions perceptions scale of -2.5 (more corruption) to 2.5 (no corruption), industrialized economies score around 1.8 while developing economies average 0.1 or less. Moreover, nine developing APEC economies score negatively on the index. New Zealand scored highest on the control of corruption indicator (2.35).

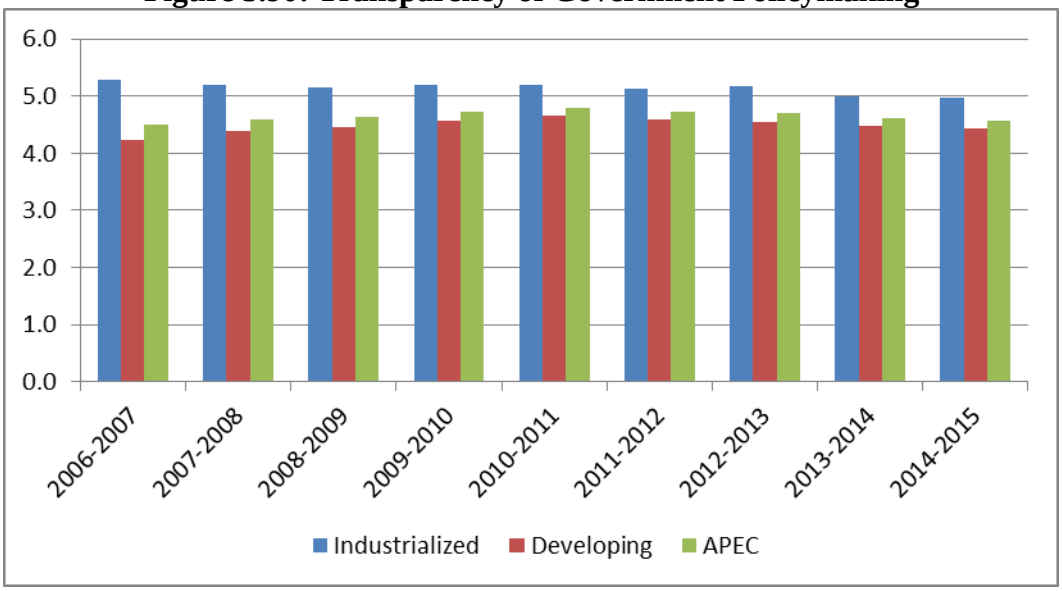
Figure 3.89: Control of Corruption Index, 2005-2013



Note: The index reflects perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as "capture" of the state by elites and private interests. Index ranges from -2.5 (more corruption) to 2.5 (no corruption).
Source: World Governance Indicators data. APEC Secretariat, Policy Support Unit calculations.

On the other hand, there is less gap between industrialized and developing economies in terms of perceptions on the transparency of government policymaking: in 2014-2015, industrialized economies scored an average of 5.0 in this index while developing economies scored 4.4 (Figure 3.90). The three APEC economies that scored the highest in terms of perceptions on policymaking transparency are Singapore (6.1); Hong Kong, China (5.8); and New Zealand (5.8).

Figure 3.90: Transparency of Government Policymaking



Note: The scores reflect average responses to the question, "In your country, how easy is it for businesses to obtain information about changes in government policies and regulations affecting their activities?" Scores range from 1 (extremely difficult) to 7 (extremely easy).
Source: WEF Global Competitiveness Index. APEC Secretariat, Policy Support Unit calculations.

4. APEC GROWTH STRATEGY: WORK REPORTED BY APEC COMMITTEES AND SUBFORA

Since 2012, the APEC Secretariat has been preparing annual reports compiling information from Committees and Sub-fora on the activities they have been implementing to promote each of the five growth attributes. The analysis on this chapter is based on the information submitted by the APEC Committees and Sub-fora between 2012 and 2014. These annual reports note that many of the activities listed are closely related to the priorities that APEC host economies have announced during their corresponding hosting years[101].

In some cases, APEC groups have reported that a single activity includes components related to more than one growth attribute. When these occur, the activity is considered in the count in all those reported growth attributes.

4.1 WORK REPORTED BY THE COMMITTEE ON TRADE AND INVESTMENT (CTI) AND SUB-FORA

Table 4.1 shows the number of activities listed by CTI sub-fora under each of the APEC Growth Strategy attributes between 2012 and 2014. Most of the activities reported by CTI sub-fora are related to the following three attributes: innovative, sustainable (green) and secure growth. They account for 97.9 percent of the activities reported by CTI sub-fora.

Table 4.1: Number of Activities Related to the Growth Strategy in CTI Sub-fora 2012-2014

CTI Subfora	Balanced	Inclusive	Sustainable (Green)	Innovative	Secure
BMG	0	1	0	7	11
ECSG	0	0	0	13	0
GOS	0	0	4	0	0
IEG	1	0	1	0	0
IPEG	0	0	0	21	0
MAG	0	0	8	0	1
SCSC	0	1	18	5	6
SCCP	0	0	0	10	9
AD	0	0	4	0	0
CD	0	0	6	0	1
LSIF	0	0	0	6	8
Other	0	0	5	1	0
Total	**1**	**2**	**45**	**63**	**36**
Share (%)	**0.7%**	**1.4%**	**30.6%**	**42.9%**	**24.5%**

Source: APEC Secretariat, Policy Support Unit estimates

In the case of innovative growth, the bulk of the work takes place in three subfora: the Intellectual Property Experts Group (IPEG), the E-Commerce Steering Group (ECSG) and the Sub-Committee on Customs Procedures (SCSC).

[101] For example, see APEC Secretariat (2013), "Annual Review on the Implementation of the APEC Growth Strategy", Document 2013/CSOM/022.

In the case of IPEG, many of the activities concerned the use of web-based platforms to share information, such as the case of the Intellectual Property Academy Collaborative Initiative (iPAC initiative). Other activities involved the development of guidelines (e.g. model IPR guidelines to promote the creation and dissemination of creative content in the digital environment); the elaboration of surveys to help governments to understand problems and propose new policies (e.g. survey on innovation and technology transfer); and measures to strengthen cooperation among IPR authorities to exchange information and improve enforcement efforts.

ECSG activities linked to innovative growth are related to the development of projects in two areas: data privacy and paperless trading. Many of the reported activities include stocktaking exercises (e.g. certification of data processors, privacy frameworks), the implementation of the APEC Cross Border Privacy Enforcement Arrangement, and the organization of workshops related to the two aforementioned areas.

Regarding the SCCP activities on innovative growth, they are basically related to capacity-building efforts to implement single window systems and strengthen border enforcement on IPR infringements.

With regard to the activities associated to sustainable (green) growth, most of them are conducted within the Sub-Committee on Standards and Conformance (SCSC) and the Market Access Group (MAG).

A majority of the SCSC activities related to green growth are closely related to the topic of energy efficiency. SCSC has organized workshops on the matter, as well as promoted the harmonization of energy efficiency standards for specific products (e.g. air conditioners). Other activities focus on green technologies associated to the construction of buildings. Seminars and studies related to the design and implementation of building codes took place between 2012 and 2014.

For MAG, the bulk of green growth activities are associated to the exchange of information and workshops to raise awareness on the development and promotion of environmental goods and services.

As for secure growth, the Business Mobility Group (BMG) leads among the CTI subfora in terms of the number of implemented activities, followed by the Sub-Committee on Customs Procedures (SCCP) and the Life Sciences Innovation Forum (LSIF).

In the case of BMG, the activities seek to improve border control against terrorism or illegal activities, and also facilitate the movement of business people across borders. On the one hand, there are initiatives that seek to implement systems to share and validate information at the border in real time (e.g. the implementation of a pilot on the Regional Movement Alert System). On the other hand, BMG has been working on improving the features of the APEC Business Travel Card (ABTC) to make it easier and less cumbersome for business people to travel across the APEC region.

The SCCP has also been working actively in secure growth projects. Many of them promote the implementation of Authorized Economic Operator (AEO) systems. In that regard, the discussions at SCCP include the development of AEO capacity building programs and best

practices. Other initiatives linked to the concept of AEO entail designing and sharing methods to identify AEOs in a reliable way.

In the case of LSIF, the discussions on secure growth are related to human security, more specifically to infection control and fight against non-communicable health conditions (e.g. cancer, diabetes, mental health). The development of action plans, best practices and public-private partnerships have been common features within LSIF.

4.2. WORK REPORTED BY THE ECONOMIC COMMITTEE (EC)

As seen in Table 4.2, most of the activities undertaken by the EC and associated sub-fora (Competition Policy and Law Group, CPLG) are associated to the balanced and inclusive growth attributes[102].

Table 4.2: Number of Activities Related to the Growth Strategy in the EC 2012-2014

EC Friends of the Chair and Subforum	Balanced	Inclusive	Sustainable (Green)	Innovative	Secure
Corportate Law & Governance	3	3	0	0	0
Ease of Doing Business	7	6	0	0	0
Public Sector Governance	5	5	0	0	0
Regulatory Reform	2	1	1	1	0
Competition Policy and Law Group	6	5	0	0	0
Others	11	1	0	1	0
Total	**34**	**21**	**1**	**2**	**0**
Share (%)	**58.6%**	**36.2%**	**1.7%**	**3.4%**	**0.0%**

Source: APEC Secretariat, Policy Support Unit estimates

Under the framework of the Ease of Doing Business initiative, several capacity-building activities such as workshops, seminars, diagnostic studies, guided visits to champion economies, and direct advice to interested economies have been organized. These activities have targeted either individual economies or the APEC region as a whole and the intention is to conduct reforms in certain areas that will reduce the cost, time and burden to do business (e.g. diagnostic studies to make it easier, faster and cheaper to start a business; capacity; workshops on getting credit; among others). These activities have been playing an important role in promoting reforms, which benefit to both consumers and producers, in particular to SMEs and those groups with fewer resources.

Several activities in the EC have dealt with the promotion of well-functioning, open and competitive markets, which is one of the ANSSR pillars aiming to contribute to a more balanced and inclusive growth. Competition policy-related activities, such as research projects to analyse measures of competition development; policy discussions on competitive neutrality; training courses on the investigation of anti-competitive practices; and workshops to raise awareness and develop projects to promote structural reforms in specific markets (e.g. energy sector) have taken place between 2012 and 2014.

[102] As opposed to CTI and SCE, the EC does not have a structure in which several working groups on specific fields/areas report to the committee. Instead, under the EC, small groups called Friends of the Chair (FoTC), constituted by volunteering economies, discuss work plans and initiatives related to very specific areas, which are listed in Table 4.2.

Many EC activities are also related to the issue of promoting transparency. In 2013, the FoTC on Public Sector Governance worked on a report aiming to promote fiscal transparency and public accountability. Other examples include policy discussions on best practices to strengthen public service quality and government transparency, as well as sharing experiences in conducting bureaucratic reforms.

The consequences of the Global Financial Crisis have promoted the realization of new activities focusing on balanced growth. Some examples are related to discussions on the middle-income trap, as well as recent economic trends and developments within the APEC region; and projects to identify key lessons from the financial crisis concerning the functions and roles of regulatory and enforcement bodies. In addition, under the framework of ANSSR, some projects have been targeting ways to improve inclusive growth; for example, projects to improve the quality of vocational education training programs.

Under the work plan of the FoTC on Regulatory Reform, two projects on case studies analyzing regulatory reforms on energy efficient and renewable energy sectors (green investments), and promoting innovation, took place between 2012 and 2014. The purpose was to draw lessons and suggest policy recommendations on the implementation of reforms in those areas, based on past experiences. These projects were closely associated to the attributes of balanced growth (i.e. the efforts to learn more of the process to conduct reforms), green growth and innovative growth.

4.3 WORK REPORTED BY THE SOM STEERING COMMITTEE ON ECONOMIC AND TECHNICAL COOPERATION (SCE) AND SUB-FORA

Table 4.3 shows the number of activities listed by SCE sub-fora under each of the APEC Growth Strategy attributes between 2012 and 2014. As opposed to CTI and EC, the activities reported by SCE sub-fora are more evenly distributed among growth attributes. As seen, around 34.8 percent of the reported activities were related to secure growth, while 25.4 percent dealt with issues related to sustainable/green growth. Activities linked to innovative and inclusive growth made up 19.3 percent and 17 percent of the activities recorded during this period.

Table 4.3: Number of Activities Related to the Growth Strategy in SCE Sub-fora 2012-2014

SOM Steering Committee on ECOTECH	Balanced	Inclusive	Sustainable (Green)	Innovative	Secure
ATCWG	0	1	2	3	9
ACT	0	0	0	0	5
CTTF/CTWG	0	0	0	0	16
EPWG	0	0	0	0	13
EWG	2	0	14	0	5
EGILAT	0	0	5	0	0
ISTWG	0	0	3	3	0
HWG	0	5	0	2	10
HRDWG	1	5	1	6	3
MTF	1	1	2	0	0
OFWG	0	2	14	5	3
PPSTI	0	1	4	7	3
PPWE	0	2	0	0	0

SMEWG	1	13	4	9	8
TELWG	2	6	1	8	8
TWG	2	3	5	3	2
TPTWG	0	1	6	0	7
Others	0	5	6	5	0
Total	**9**	**45**	**67**	**51**	**92**
Share (%)	**3.4%**	**17.0%**	**25.4%**	**19.3%**	**34.8%**

Source: APEC Secretariat, Policy Support Unit estimates

Regarding secure growth, it is not a surprise that the sub-fora reporting the largest number of activities in this topic are the Counter-Terrorism Task Force/Working Group (CTTF/CTWG) and the Emergency Preparedness Working Group (EPWG). Many of the capacity-building activities in CTTF/CTWG deal with issues closely related to the secure movement of passengers and goods. This working group reported the organization of several workshops in topics such as air cargo security, aviation security, checkpoint optimization capacities, and trusted traveler programs. In addition, the group has also been developing work programs and policies in secure infrastructure and anti-money laundering, among others.

EPWG activities have been focusing on activities aiming to increase resilience and preparedness against emergency situations (e.g. natural disasters). EPWG has been organizing policy dialogues, workshops and seminars in a broad range of topics such as the application of satellite technologies for emergency preparedness; the application of geospatial hazard and risk information; the role of science and technology in disaster preparedness and risk reduction; the preparation of business continuity plans; and the need for better travel facilitation for emergency responses, among others.

The Health Working Group (HWG) and the Agricultural Technical Cooperation Working Group (ACTWG) have also reported many activities in relation to secure growth. For example, under HWG, a number of activities were conducted concerning the prevention of anti-microbial resistance and ways to strengthen health systems to support universal health coverage. In addition, studies were prepared in topics such as food trade safety to prevent the spread of avian influenza; and the evaluation of dengue early warning through virus analysis and data sharing.

Under the ACTWG, many of the projects deal with food security matters, such as food safety assessments; plant biotechnology; sustainable management to enhance food production; technology transfer in agriculture; use of technologies to increase food productivity; food emergency mechanisms; and good animal husbandry practices, among others.

Regarding sustainable/green growth, the vast majority of projects were reported by the Energy Working Group (EWG) and the Ocean and Fisheries Working Group (OFWG). The EWG has been very active implementing projects regarding low-carbon cities, energy efficiency, green transport, electric vehicles, smart grids and renewable energy sources, among others.

The OFWG has also been implementing projects on food security, management of the marine ecosystem and climate change impact on oceans and fishing resources. In addition, the OFWG is supporting a pathfinder initiative on illegal, unregulated and unreported fishing.

In relation to innovative growth, many activities were reported by the Small and Medium Enterprises Working Group (SMEWG), the Telecommunications Working Group (TELWG) and the Human Resources Development Working Group (HRDWG). At the SMEWG, the emphasis has been to conduct activities on innovation, job creation, economic growth and

business opportunities. In that regard, conferences on start-up policies and best practices to promote entrepreneurship were organized. The SMEWG has been conducting a number of projects on innovation through SME financing.

As for the TELWG, it has organized activities focusing on mobile payment technologies, cloud computing, Internet Protocol version 6, ICT applications and expansion of high speed broadband networks. In addition, the TELWG has started discussions on the "internet of things" (i.e. goods embedded with electronics or software and send data to manufacturer). In the case of the HRDWG, the projects associated to innovative growth have been linked to the development of entrepreneurial skills and the use of ICT in education and training.

In terms of the activities related to inclusive growth, the SMEWG reported the largest number among SCE sub-fora. The SMEWG initiated a survey to prepare an APEC SME Monitoring Index, with the intention of having a better picture on areas such as entrepreneurship, demographics, economic contribution, etc., which may allow to identify bottlenecks and suggest policy recommendations. The SMEWG has also been working on capacity-building activities on business ethics for SMEs and SME financing. In addition, train-the-trainer courses for women on SMEs have been organized to assist women to gain skills to improve their competitiveness and participate more actively in the economy. Some activities also seek to promote networking among women in the region and develop their capacity to export.