Editorial Statement

The Pacific Economic Cooperation Council (PECC) is a unique tripartite partnership of senior individuals from businesses and industries, governments, academia and other intellectual circles. All participate in their private capacity and discuss freely on current, practical policy issues of the Asia-Pacific region.

PECC was established in 1980. It currently has 25 member committees from all over the Asia-Pacific region. Each member committee comprises tripartite senior representatives. In addition, PECC comprises two institutional members: the Pacific Trade and Development Conference (PAFTAD) and the Pacific Basin Economic Council (PBEC).

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The Chinese Taipei Pacific Economic Cooperation Committee (CTPECC) was formed in 1984, with the purpose of participating in PECC events as an observer. In November 1986, CTPECC's application for membership was approved by PECC at the 5th General Meeting. Since then, CTPECC has become a full and active member of PECC.

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China's Economic Outlook and its Impacts on the world

Darson Chiu

Introduction

Besides the plunging crude oil price since mid-2014, the slowing Chinese economy would be a main reason why the International Monetary Fund (IMF) has continued to downward adjust its global economic growth forecast for the past one year.[1]

Emerging market and developing economies have constantly outperformed advanced economies in terms of GDP growth. Among all emerging market and developing economies, China has had higher growth during the period of its 11th and 12th five year plans providing strong momentum to the emerging and developing Asia. With its tremendous economic size, all eyes have been on China and its business potential. However, the most recent global financial crisis caused certain serious and negative impacts on China's economic structure.

The consequences resulted from the crisis have dragged down China's growth to a certain extent. It seems that China is now striving to avoid a hard landing, while a likely soft landing is often stressed by the market

[1] The most recent downward adjustment was issued on April 12, 2016 lowering the forecast for 2016 global GDP growth from 3.4% to 3.2%.

as inevitable. As a result, the emphasis must be on the implications for the global economy, as the growth rates between the world and China are becoming more correlated. Nevertheless, the impacts on global economy can be mitigated if the Chinese economy is able to fulfill its goals of the 13th five-year plan.

China's Economic Performance during its Previous Five-Year Plans

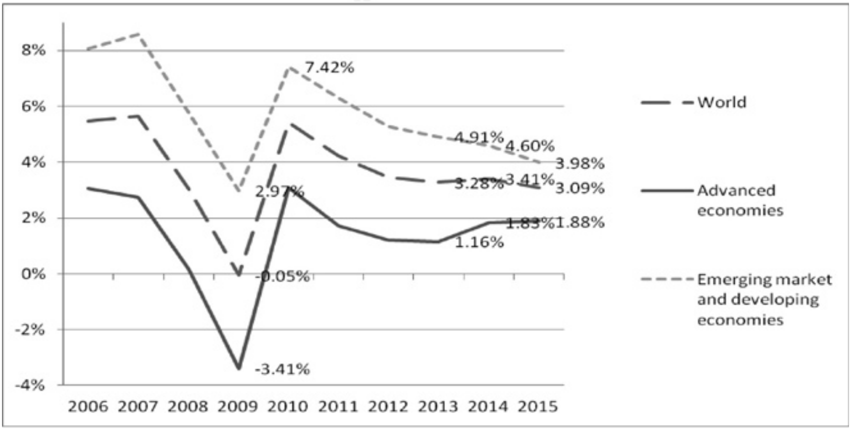
The most recent global financial crisis occurred in 2008-2009 during the period when China underwent the process of its 11th five-year plan. Many believed that the financial crisis caused a paradigm shift in China forcing the country to kick off a much needed structural reform. The reform in response would take place in the following five-year plans.[2]

In addition to the global financial crisis, China's GDP surpassed Germany first and Japan later on becoming the second largest economy only next to the United States of America at the 11th five-year plan phase as well. China's economic significance at its 11th five-year plan phase paved the way for surpassing the US and being the world's largest exporting country at the 12th five-year plan phase.

Emerging market and developing economies have constantly outperformed advanced economies in terms of GDP growth. Among all emerging market and developing economies, China has had higher growth during the period of its 11th and 12th five year plans providing strong momentum to the emerging and developing Asia.

[2] 11th five-year plan was from 2006 to 2010. 12th five-year plan was started in 2011 and ended in 2015. 13th five-year plan is planned to launch in 2016 and stop in 2020.

Figure 1. World GDP Growth Comparison



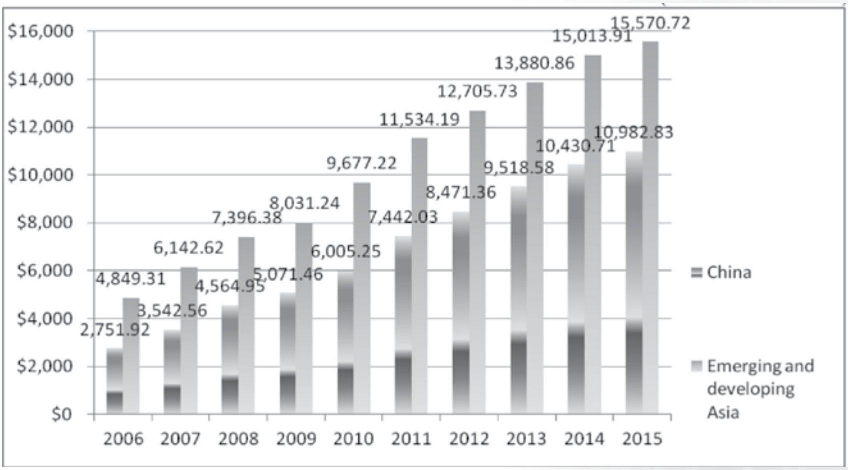
Source: IMF World Economic Outlook Database, April, 2016.

Figure 2. GDP Growth Comparison of Emerging Market and Developing Economies

Source: IMF World Economic Outlook Database, April, 2016.

Figure 3. Economic Size of China vs. Emerging and Developing Asia[3]

(Unit: billion USD)



Source: IMF World Economic Outlook Database, April, 2016.

The IMF has further categorized the emerging into diverse geographic cohorts: a) emerging and developing Asia, b) emerging and developing Europe, c) Latin America and the Caribbean, d) Middle East, North Africa, Afghanistan, and Pakistan, and e) Sub-Saharan Africa. Obviously, the emerging and developing Asia had much higher GDP growth than the other four cohorts from 2006 to 2015. In the year of 2009 for example, as the GDP of emerging and developing Europe declined by 2.99%, and GDP of Latin

[3] Emerging and developing Asia composed of 29 countries: Bangladesh, Bhutan, Brunei Darussalam, Cambodia, China, Fiji, India, Indonesia, Kiribati, Lao P.D.R., Malaysia, Maldives, Marshall Islands, Micronesia, Mongolia, Myanmar, Nepal, Palau, Papua New Guinea, Philippines, Samoa, Solomon Islands, Sri Lanka, Thailand, Timor-Leste, Tonga, Tuvalu, Vanuatu, and Vietnam.

America and the Caribbean decreased by 1.25%, whereas the emerging and developing Asia still managed to pull off an economic annual growth of 7.23%.

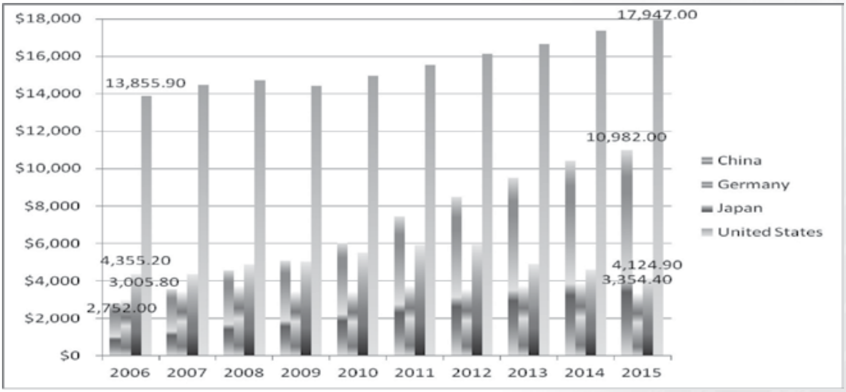
Emerging and developing Asia composed of 29 countries stood at US$ 4,849.31 billion in 2006 and US$ 15,570.72 billion in 2015 in terms of total GDP. By comparison, China's GDP was in total 2,751.92 billion in 2006 and 10,982.83 billion in 2015. It means that the size of China's economy was 53% of emerging and developing Asia in 2006 and 71% of the cohort in 2015. Among all 29 emerging market and developing economies, China has not only had higher growth but also the biggest economic size during the period of its 11th and 12th five year plans providing strong and major thrust to the emerging and developing Asia.

By comparing nominal GDP, the US, Japan, and Germany were all bigger than the Chinese economy in 2006. However, China surpassed Germany in 2007 and Japan in 2009 becoming the second largest economy with its strong pace of economic growth. Since the year of 2014, China's nominal GDP has grown to be more than double of Japan's economic size. It can be concluded that during the period of China's 11th and 12th five-year plans, China's economic performance had been remarkable turning the global spotlight on the country.

During the period of two five-year plan, the Chinese economic growth had relied heavily on the external demands. The annual nominal exports of China stood at US$ 1,333.35 billion beating Germany's US$ US$ 1,292.58 billion and becoming the second largest exporting country in 2009. In 2013, China's annual exports were accounted as US$ 2,355.08 billion surpassing the total exports of US amounting at US$ 2,263.65 billion. China has become the largest exporting country in the world since then. In 2010, China's annual imports were accounted as US$ 1,380.92 billion beating Germany's US$

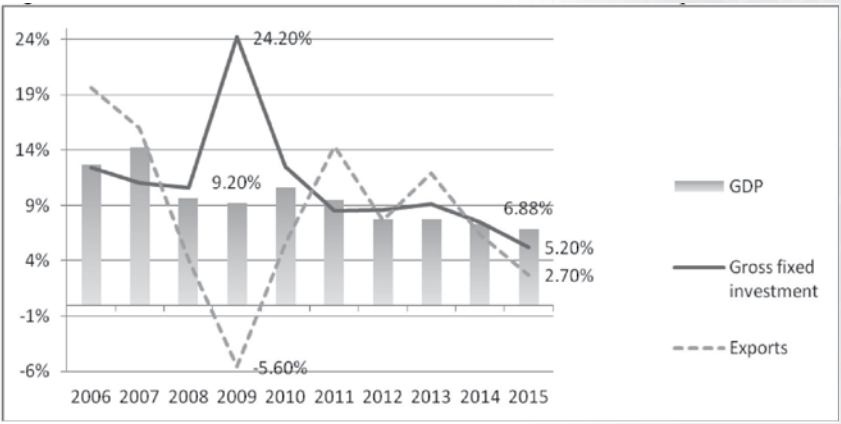
Figure 4. Nominal GDP Comparison

(Unit: billion USD)



Source: EIU Country Data, April 2016.

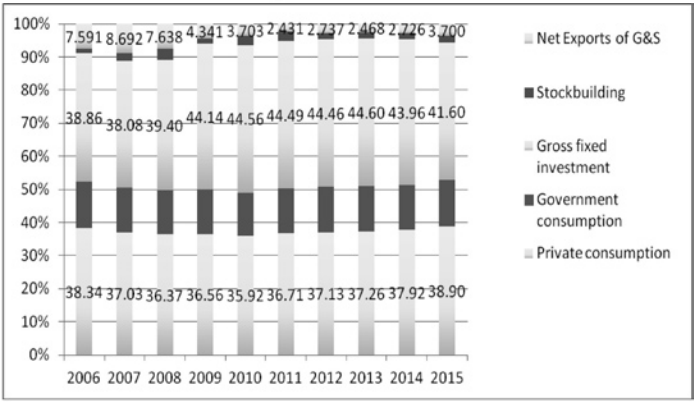
Figure 5. Growth Rates of China's GDP, Fixed Investment, and Exports



Source: EIU Country Data, April 2016.

1,263.54 billion and becoming the world's second largest importing country only next to the US since then.

Figure 6. Economic Structure of China 2006-2015



Source: EIU Country Data, April 2016.

The Global Financial Crisis and Consequences

Despite the significance of China's economic performance in the global arena during the period of its 11th and 12th five-year plans, China like all other countries is hardly immune from the most recent global financial crisis. The weakened global demand caused by the crisis had impacted on China's exports in 2008-2009. For example: China's growth rate in exports was negative 5.6% in 2009. In response, China issued a US$ 586 billion stimulus package and pushed up the growth rate of gross fixed investment to 24.2% in 2009. The stimulus package has been criticized for not only causing a severe surge in Chinese debt among local governments and state owned enterprises (SOE) but also serious overcapacity ever since.

Besides issues of soaring debt and troubles of overcapacity, the crisis also triggered a structural shift in Chinese economy. The net exports accounted 6.39% on average over China GDP from 2006 to 2010, the period of 11th five-year plan. However, the averaged ratio dropped to only 2.81% from 2011 to 2015, the period of 12th five-year plan. The Beijing government realized that it had to promote private consumption and cope with over investment, while the external demands shrank.

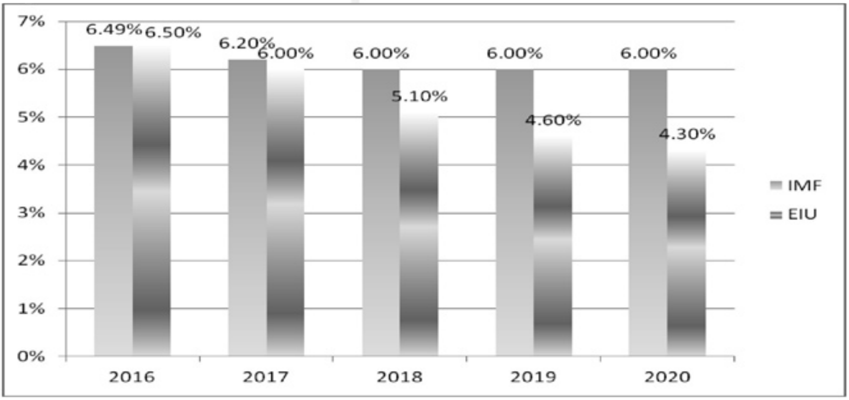
The averaged ratio of private consumption over GDP was 36.84% from 2006 to 2010, and the averaged ratio stood at 37.58% from 2011 to 2015. Furthermore, the ratio on average of gross fixed investment over GDP was 41.01% from 2006 to 2010, whereas the ratio stood at 43.82% from 2011 to 2015. The readings actually mean that China's 11th and 12th five-year plans were not very successful in promoting private consumption and reducing over investment despite the fact that China's economic performance was in general outstanding by the year of 2012. China's GDP grew by 7.7% in 2012, the lowest rate since 1999. As the European sovereign debt crisis happened in 2012, and the European Union (EU) was China's top exports destination; weakened demands in EU caused negative impacts on China's growth. In 2015, the Chinese annual GDP only grew by 6.88% that is the lowest growth rate so far since 1990.

China's 13th Five-Year Plan

Beijing top officials gathered in a four-day Central Economic Work Conference in December 2015 to confirm the goals of 13th five-year plan and concluded that the needed measure would be "supply-side structural reform".[4] In contrast to the demand-side including consumption, investment,

[4] China's government work report, issued on March 6, 2016, emphasized strengthening supply-side structural reform by reducing low-end manufacturing and increasing high-end production.

Figure 7. GDP Growth Forecasts of China 2016-2020



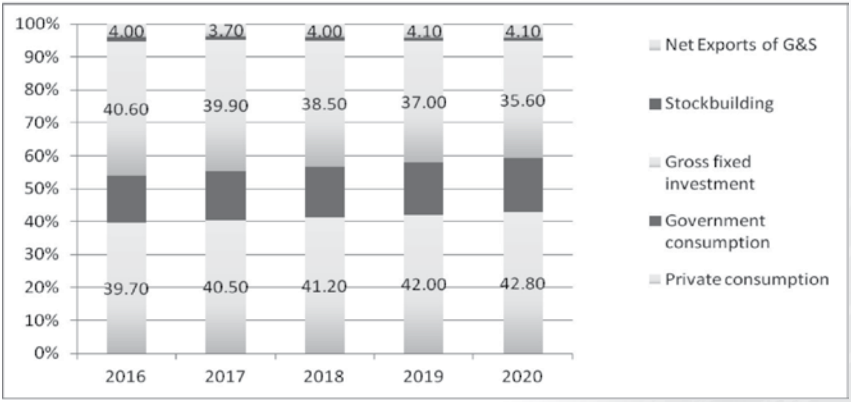
Source: IMF World Economic Outlook Database, April, 2016 & EIU Country Data, April 2016.

and exports, the supply-side is about coordinating labor, land, capital, and innovation in a more efficient fashion. Beijing identified 5 major tasks: a) cut excessive industrial capacity, b) destocking, c) deleveraging, d) lower corporate costs, and e) improve weak links.

Besides developing industries towards high-end outputs, modernizing the agricultural sector, advancing manufacturing industries, and exploring strategic emerging industries, the 13th five-year plan specifies specific goals: a) annual GDP growth rate of over 6.5% on average and b) service sector accounting for 56% of GDP.

Beijing's 12th National People's Congress adopted the outline of the 13th five year plan and stressed its goals in March 2016. However, GDP growth forecasts conducted by major international agencies, IMF and EIU, in April 2016 showed that China could only fulfill its goal for economic growth for 2016. China's future economic growth can only reach on average 6.138

Figure 8. Expected Structure of China Economy



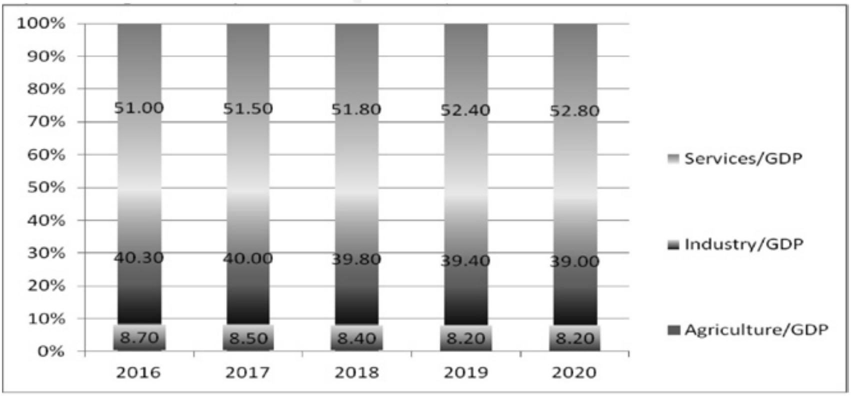
Source: EIU Country Data, April 2016.

according to the IMF forecast and 5.3% as said by the EIU.

As for expected structure, China's private consumption over GDP ratio is expected to reach 41.24% on average during the period of 13th five-year plan. In addition, China's gross fixed investment over GDP ratio is expected to stand at 38.32% on average during the same period. In terms of promoting private consumption and reducing over investment, China's next five-year plan is believed by EIU to be more successful than the previous two five-year plans.

However, the EIU forecast predicts that China will not be able to expand its service sector as planned in its 13th five-year plan. EIU trusts that China's service sector will account at most as 52.8% of GDP in 2020, lower than the target ratio of 56%. Despite international agencies have no faith in China to fulfill its goals, the size of Chinese economy will remain significant and is still likely to cause the global economy to slow down as well.

Figure 9. Expected Origin of China Economy



Source: EIU Country Data, April 2016.

Conclusion

The Chinese economic performance was overall good during the period of its 11th and 12th five-year plans. Since the year of 2012, the Chinese economy has started to slow down due to diminishing global demands. The slowing process is expected to continue by referring to the forecasts conducted by international agencies. Although China set specific goals for its 13th five-year plan, international agencies consider that the goals can hardly be fulfilled.

The implication is that China may grow much slower in the future and that will also slow down the recovery of the world. Nevertheless, the Beijing government seems confident in fulfilling its economic goals. That actually means that the potential impacts on the world can be mitigated if the Chinese economy is able to fulfill its targets of 13th five-year plan.

(Dr. Darson Chiu is the Director General of CTPECC.)

The New Age of Financial Cooperation in the Asia-Pacific Region

Eric Chiou

In the end of 2015, a new multilateral financial institution, the Asia Infrastructure Investment Bank (AIIB) had formally launched its debut and became the only regional bank focused on providing financial assistances to infrastructure projects for countries in the Asia-Pacific region.

From various perspectives, the formation of the AIIB may be a good news for the Asia-Pacific region as a whole, since this region is indeed in short supply of financial loans for infrastructure projects, and desperately in need of related transportation and telecommunication facilities for enhancing economic development and connectivity between countries and people in the region.

In 2013, when Indonesia was a host economy of APEC, it had highlighted "promoting connectivity" as one of three priorities of the year, and singled out physical connectivity, institutional connectivity, and people-to-people connectivity as the major themes for the efforts. Without doubt, infrastructure development and promotion of infrastructure investment are keys to achieve physical connectivity and to facilitate economic exchanges and regional integration.

Despite the significance of infrastructure development to fostering APEC's connectivity, many APEC members and countries in the region are troubled due to lack of sufficient financial support to undertake some infrastructure projects. According to the Asian Development Bank (ADB), another regional financial institution with recent concentration on poverty alleviation, it estimates that Asia totally needs about 8 trillion dollars for infrastructure projects from 2010-2020. Both ADB and the World Bank currently could not provide necessary funding to this demand, which opens the window of opportunity for the formation of the AIIB.

The proposal of the AIIB initiated by China had been discussed in fora of APEC meetings in 2013 and 2014. Some members, like the United States and Japan, were suspicious of this idea and afraid of its competition with existing international financial institutions, like the World Bank and the ADB, while other members, such as many developing economies, held relatively positive views and anticipated more friendly and generous terms for the loans of infrastructure projects.

Against the backdrop of US objection but other countries' endorsements, the AIIB was eventually launched in 2015, including 57 countries as its members. Nevertheless, two regional heavy-weight countries, the United States and Japan, were not included, which makes the AIIB become one of few international financial institutions completely dominated by developing countries, since China is single-handedly taking 26.06% of initial capitalization shares of the bank. It is followed by India's 7.51%, Russia's 5.92%, Germany's 4.15%, and South Korea's 3.50%. The proportion of share structure in the AIIB is distinctly different from those in the World Bank and the ADB, which are dominated by the United States, Japan and other western countries.

In other words, the fact that China possesses overwhelming power in the AIIB suggests that Beijing is likely to dictate its direction without any objection. The significance of this change that China takes the lead in this new multilateral financial institution highlights the following points that deserve much attention.

First, it brings challenges to existing lending terms of international financial institutions. One distinctive characteristic between the China-led AIIB and other existing international financial institutions is that China emphasizes the principle of non-interference when considering loan assistances. In other words, the loans from the AIIB may be more appealing to many developing countries, since their terms will not be as strict and demanding as the existing financial institutions. The loans from the latter usually require developing countries to undertake some controversial reforms in economic and political fields, which are not well-received by developing countries. Thus, the competition with the AIIB will place pressure on the World Bank and the ADB to revise their lending terms for developing countries.

Second, it creates and spreads a distinct development model from the West. The establishment of the AIIB signifies the contribution of a rising China to the world, while it also indicates another successful pathway to remarkable economic development for developing countries. In other words, with the operation of the AIIB, Beijing can steadfastly promote its unique model of "state capitalism" overseas with the financial leverage of the AIIB, which is likely to undermine the influences of existing international financial institutions under the so-called Bretton Wood system established after the World War Two, while reducing intrusive political agenda of the West embedded in financial loan packages for developing countries.

Third, it establishes an international financial institution without the clout of US veto. Another critical implication of the AIIB is that it is an independent multilateral financial institution completely without the US influences, which enables China to master and shape the direction and priorities of the AIIB based on Beijing's interests. Meanwhile, the AIIB can also allow Beijing to facilitate its regional economic agenda, such as "One Belt One Road," with neighboring and related targeted countries. As a result, with the increasing loan projects funded by the AIIB, the role of China in global financial stage will become more crucial and its economic clouts overseas are likely to be more conspicuous than ever, which may finally overturn the current global economic order dominated by the US in the long run.

Despite the potential competition between the AIIB and other financial institutions, there are signs for cooperation and collaboration among these institutions. For instance, the ADB has indicated its intention to keep close cooperation with the AIIB in financing infrastructure projects in the region, while it also announces that a significant increase of its funding, up to 20 billion dollars, for infrastructure projects starting in 2017. Likewise, the president of the World Bank has also expressed his welcome attitude toward the AIIB and looked forward to more cooperation between the two.

Hence, it seems optimistic to conclude that the formation of the AIIB may generally produce more good than harm to most countries in the region, since its objectives and functions are designed to appropriately satisfy the severe shortage of financial loans for infrastructure projects. Although its actual performances remain time to tell, the effects of the AIIB stimulating more attention to and debates over the financial needs of developing countries have already generated some positive results, which impel the existing financial institutions to seriously confront the needs of developing countries and adjust their modus operandi from a debtor's perspective, not just condescendingly to require developing countries to do whatever they think best for them from a creditor's view. And the expected outcomes of more progressive infrastructure developments due to sufficient financial support are likely to reinforce connectivity in the region, boost economic growth, and spread more economic benefits for all members in the end.

(Eric Chiou is an Assistant Professor of National Chiao Tung University.)

APEC Supports the Abolish of Export Subsidies to Accelerate Food Trade

Wayne Chen

Agriculture has been one of the most important (and also controversial) link in FTA/RTA negotiations as well as on the WTO agenda. No doubt that a number of important decision agreed by 163 members on agriculture at the WTO 10th Ministerial Conference was a significant step forward, of which eliminating export subsidies for farm exports was an outcome drew a wide range of attentions.

Primary decisions concluded on agriculture at MC10 are related to Export Competition, Public Stockholding for Food Security, and Special Safeguard Mechanism for Developing Countries. In the regard of Export Competition, the "Nairobi Package" is composed of the elimination of export subsidies, new rules for export credits, and decisions on international food aid and exporting state trading enterprises. As said by the WTO report that "the decision to fully eliminate any form of agricultural export subsidies is an historic decision and constitutes a significant step in the reform of agricultural trade".

According to the WTO Ministerial Decision on Export Competition adopted at MC10, developed members shall immediately remove export subsidies on mostly farm products while developing countries will accomplish the commitment by 2018. Meanwhile, WTO members should refrain from applying export subsidies in a manner that circumvents the requirement to reduce and eliminate all export subsidies, and export subsidies should not exceed the average level of the past five years on a product basis.

Moreover, developing countries will continue to benefit from keeping the flexibility of covering marketing and transport costs for agriculture exports until the end of 2023 (Article 9.4 of the Agreement of Agriculture), and the least developed and food-importing developing countries will enjoy additional time to cut export subsidies.

Considering that extensive subsidies on farm product is not only costly to taxpayers but creating distortions in the economy, and hindering global food trade. In this light, subsidies are recognized as trade barriers and repeal of subsidies will stimulate food trade and enhance food security globally. Poor states that having less developed food industries and financial resources for subsidies will benefit from greater engagement in global and regional food chains.

To support the Ministerial commitment of WTO and in an extend to foster capacity of APEC members, developing economies in particular, to meet the requirement and the time frame to eliminate subsidies, related issues were centered at the 2016 APEC first senior official meetings and 3 initiatives were tabled for discussion.

Discussion and Proposal Document on Fisheries Subsidies

proposed by Peru

Peru, the 2016 APEC host, is also famous for fishery products, including the fishmeal of which Peru is the biggest exporter in the globe. As a result, the Peruvian initiative is focused on improving awareness of fisheries subsidies, and combating illegal, unreported and unregulated fishing (IUU) to ensure sustainable marine resource management.

Ocean play an essential role to regional economic integration and prosperity in APEC considering that APEC members account for over 65% of global capture fisheries and marine transport is essential to connect people and merchandise in the region. On the other hand, UN also attaches great importance to improving sustainable management of marine resources by combating IUU and eliminating subsidies that contribute over capacity and over-fishing. Moreover, in 2015, UN leaders agreed to "prohibit certain forms of fisheries subsidies,... and refrain from introducing new such subsidies."

To meet the calls of UN and WTO, Peru emphasized that CTI should play a role to raise awareness of eliminating fisheries subsidies, and promote discussion of the Post-Nairobi process. Peru also suggested to host a seminar and incorporated related language in the MRT Declaration as concrete actions of the initiative.

Improving Transparency and Information Sharing on Fisheries Assistance Programs in APEC Economies

proposed by the United States and New Zealand

Compared to the Peruvian initiative, the US and New Zealand's initiative aims to advance WTO commitment more directly by updating the 2000 APEC compendium of fisheries assistance programs which did stocktaking of fisheries programs in APEC economies. The initiative invites APEC members to review and submit domestic fisheries assistance programs to CTI followed by a peer review process. In so doing, APEC will advance the transparency and reporting fisheries assistance programs in the WTO.

It is an ambitious project that requesting APEC members to submit own polices as well as complete peer review with a few months before an updated compendium complete by the APEC Leaders week of 2016. Intensive bilateral discussion at scheduled meetings and intersessionally are expected for conducting the deliverables. However, the peer review mechanism suggested may impose pressure on developing economies and may undermine the quality of the compendium to be noted by APEC Leaders and Ministers.

Proposal for Progressing WTO Ministers Decision to Eliminate Export Subsidies

proposed by Papua New Guinea

Tabled by Papua New Guinea, a developing economy as well as the host of APEC 2018, the proposal aims to establish a mechanism for APEC members to provide information on the elimination of export subsidies. Dissimilar to the peer review mechanism mentioned earlier, PNG's amplifies the WTO commitment and the time frame agreed on abolishing export subsidies. However, in the regard of information exchange, no concrete methods brought up in the proposal which may lead to an unforeseeable outcome for APEC 2016 and beyond.

(Wayne Chen is an Associate Research Fellow at the Chinese Taipei APEC Study Center.)

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Climate Change and Green Investment: Case Studies of China and Thailand

Tiffany Chiang

Climate change and the consequences it brings have become frequently discussed topics globally. As many developing economies take off, carbon emissions and energy consumption increase drastically to accommodate for the growing economic activities. Byproducts of economic development can severely or even permanently damage the earth. Extreme climates such as droughts, floods, record high and record low temperatures are evidences of such damage. Taking into consideration that consequences are felt internationally and not just in the countries polluting, many international institutions and seminars, as well as APEC, have included the issue of climate change into their discussions. This paper serves the purpose of using two particular case studies, China and Thailand, to observe sustainable development and green investment in the Asia Pacific.

Even though its growth has slowed down in the recent years, China's economy has been growing rapidly since its initiation of market reforms in 1978. China's GDP growth averages at about 10 percent a year, lifting more than 800 million people out of poverty. However, rapid economic growth comes with a major consequence - pollution. Air pollution, floods, and droughts are prevalent environmental issues and byproducts of economic development faced by the country. To bring problems to perspective, it is estimated that more than 1.6 million people per year die in China from breathing toxic air. The environmental condition in China has declined to a point where it is impossible for the government to ignore.

China's 11th Five Year Plan from 2006 to 2010 successfully addressed the issue of sustainable development. The plan has three main goals: increase consumption of renewable energy sources, increase total investment in treating pollution by 15% annually, and environmental investment reach 1.33% of GDP by 2009. Moreover, the Chinese government also promised to grant public access to environmental information and updates. Unlike the 11th Five Year Plan which established broad goals but was not specific on how to reach these goals, the 12th Five Year Plan provided the details. The 12th Five Year Plan established that the central government will provide increased financial support to improve environmental public services and initiate environmental tax reform. As an incentive for enterprises to cut down on emissions, the environmental tax reform is a credit rating system for companies' environmental behaviors. Devoted to improving its environment, China spent more than 90 billion US dollars on the renewable energy sector in 2014, which was more than a quarter of the world's total investment in green technology.

To invest further into sustainable development, China, on December 22, 2015, became the first country to issue green bonds. These bonds are dedicated specifically to finance and raise the capital needed from private sectors globally to support the country's transition into a green economy. Issued by government qualified organization, they are exempt from taxes, which makes them more attractive than regular taxable bonds. The green bonds have six major themes, energy saving, pollution prevention and control, resource conservation and recycling, clean transportation, clean energy and ecological protection, and climate change adaptation. China, as a wealthy country with relatively huge impacts on the international level, is capable of spending large amounts of money to better their environment.

Amongst China and other developing countries that are investing a significant amount in the recent years in sustainable development is Thailand. As a much smaller and not as wealthy country compared to China, Thailand does not have the ability to solve the majority of their environmental issues with money. The environmental problems Thailand encounters due to climate change include water shortages, droughts, floods, and severe coastline erosion.

Comparatively later than China, it was not until the 1990s when Thailand started to pay attention to sustainable development. In 2002, the Thai government established something of similar nature as the green bonds in China- the Energy Efficiency Revolving Fund. This Fund offers credit lines at no interest to local banks so they could provide loans for energy efficiency projects. Moreover, in 2012, the country created the Thailand Climate Change Master Plan from 2012 to 2050. This plan was created in hope to mitigate greenhouse gas emissions, strengthen the capacity of human resources and institutions to manage the risks from the effects of climate change, and increase adaptation for coping with the negative effects of climate change. Thailand sets the goal of reducing green house gas emissions by 25% by the year of 2030. Even though ambitious goals were concluded to, Thailand fails to provide the steps and details.

Despite being developing countries, China and Thailand are actively investing in green economy. Both use strategies such as capacity building, awareness-raising, and demonstration to large scale investments to achieve their goal. However, wealthy, China is able to pump more resources into the process. China's economy has experienced different phases of development in the past two decades. It is now undergoing change and shifting its focus to consumption and service sectors rather than heavy polluting industries and manufacturing.

International organizations and forums such as APEC have also been tackling environmental issues in the world experiencing climate change. In November 2014, leaders from member economies of APEC gathered in Beijing to sign a declaration that agrees upon actions geared toward improving the environment and sustainable use of natural resources. The document emphasizes on the goals to double the share of renewable energy in APEC by 2030. Moreover, it promotes green investment in member economies. Despite the fact that the environment is not yet the biggest concern of APEC, there is a potential that it will be the center of discussion in the years beyond 2020.

Many scholars argue that economic growth will further damage the environment through increased greenhouse gas emissions and heavy polluting industries; however, the case of China seems to suggest the opposite. Rapid economic growth in China did hurt the environment initially, but also allowed China to better its environment through capacity building. As wealth accumulates in the country, China is capable of larger investments in green technology and consumption. Thailand, on the other hand, needs to focus more on capacity building. As it further advances in economic development, Thailand will be able to pump more money into sustainable development and set concrete goals. Whether China and Thailand will be successful in establishing a green economy or not has yet to be determined, but they are on their way.

(Tiffany Chiang is the Research Intern of TIER and Student of College of William and Mary.)

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Pandemic and Epidemic Disease Prevention - Zika virus.

Penny Ou

The 2016 Summer Olympics scheduled to take place in Rio de Janeiro, Brazil, from August 5 to August 21 has raised concerns to the spread of disease and future health of the general population worldwide, as the mosquito-borne virus Zika sweeps its way over countries and territories in the Americas. Throughout the course of history, diseases have had decisive influences on the development of mankind. Before the industrial revolution, infectious diseases were deadly, but could only cause damage in a specific area. In the tightly connected world we live in today however, infectious diseases are not only a concern to the local region in which a virus originates, but also a serious threat to human health on a global scale. Related organizations must keep up with the ever changing threats around us.

Background

The Zika fever has been a concerning issue since its wide-scaled outbreak in 2013 to this present day. Scientists first identified this virus in 1947, on monkeys in the Zika forest of Uganda, and human cases were later confirmed in the 1960s to 1980s in equatorial regions of Asia and Africa; fortunately no deaths were reported. In 2007, the first outbreak of Zika virus infected an estimated 73% of residents on the Pacific Island of Yap, and from 2013 on, the virus has spread from 4 other groups in the Pacific Islands to Brazil. As of 2016, cases have been reported across the globe in areas where vectors are found.

The virus belongs to the virus family Flaviviridae, which indicates typical transmissions are done primarily through mosquitoes or other arthropod vectors, and is related to yellow fever, Japanese encephalitis, and dengue fever. Uniquely, person-to-person transmission is also possible for the Zika virus, as cases of sexual transmission and via blood transfusion have been documented in areas where locally transmitted cases have not been reported. Symptoms generally last for seven days, and typically resemble a very weak form of dengue fever, which include fever, red eyes, joint pain, and headache. These mild and nonspecific indications pose particular challenges to the surveillance of the virus and cause complications in disease control.

Although severe cases that require hospitalization are uncommon and deaths are rare, potential long-term dangers for infected populations are being unraveled with further research and understanding of this disease in the recent 2015-2016 outbreak. Since the outbreak in 2013, Brazil, El Salvador, Mexico and other areas have reported unusual increase in the number of cases of microcephaly among newborns and individuals with Guillain-Barre syndrome (GBS). Situation reports published on June 16th 2016 by the Emergency Committee of WHO have confirmed that the Zika virus is a cause of microcephaly and GBS and experts believe the virus is likely to cause additional neurological problems that will become apparent as infected children develop. Until further information can be uncovered, the extent of damage is still unknown.

Response Actions

On February 14th 2016, WHO launched the global Strategic Response

Framework and Joint Operations Plan, acknowledging the importance of coordination amongst key responders such as the UN, NGOs, and other researchers on this global issue. A revised Zika Strategic Response Plan was announced on June 16th with added information on the situation at hand. The new response strategy has moved away from an emergency framework to a longer term programmatic approach, and includes finalizing the definition of Zika virus and its complications, developing relevant risk communication, behavior change and materials, and also focuses on management and surveillance of infected and high risk populations. Towards transmission control, the approach is to implement integrated vector management (IVM) through efficient use of resources in applications of various control methods (Sterile Insect Technique (SIT)); adaption of interventions to local vector ecology and epidemiology will be closely evaluated for evidence-based decision-making.

The Centers for Disease Control and Prevention (CDC) published a Draft Interim Response Plan on June 14th to announce protocol procedures that take action in the continental United States and Hawaii, in response to locally acquired cases of Zika infection, as well as sexually transmitted and Travel-associated infections found in the United States before locally transmitted cases were detected. Using observations from historical locally-acquired cases of related infections such as dengue, the CDC recommends applying surveillance for human-related illnesses rather than surveillance for infected mosquitoes, as investigations have shown that human illness surveillance is more informative and sensitive. Guidelines to ensuring blood safety and availability were promoted with recommendations from the Food and Drug Administration (FDA) and Council of State and Territorial Epidemiologists (CSTE), along with other action steps to communication, vector control, and patient support.

Other regional organizations have yet to establish strategic plans in specific response to the Zika virus, given the un-likeliness of the virus's nature to spread in areas not optimal to the primary vector. Precautions for non-local transmission are acknowledged in existing work plans related to blood safety, and sexually transmitted disease (STD) prevention. Listed in the Health Asia-Pacific 2020 Roadmap published in 2014 are plans to invest in the prevention of Neglected Tropical Diseases that are increasingly endemic in some APEC member economies, enhance regional cooperation on human security, and address emerging and re-emerging infectious disease outbreaks. The APEC-Life Sciences and Innovation Forum (LSIF) purposed a Blood Supply Chain 2020 Roadmap in 2015 to improve the safety and sustainability of blood supply in APEC economies through multi-disciplinary, coordinated and collaborative approaches. A Blood Supply Chain Partnership Training Network (PTN) was established to assist roadmap goals, with training on quality systems and leadership programs scheduled from 2016-2017, and further assessments until 2020. Risk communication and surveillance was emphasized in during the APEC Health Working Group (HWG) meeting in Lima, Peru on February 29th 2016, the Chair of the HWG, Dr. Victor Cuba, commented saying "Ebola, MERS and now the Zika virus underscore the increasing risk of health emergencies that we all face," and that "Adopting 'health in all policies' and a whole of government, society and region approach to health system development can help to make us safer and is at the core of APEC's health agenda."

Further approaches

Current research on vaccines for the Zika virus is prioritized on developing inactivated vaccines which are a safer option for pregnant women and those of childbearing age. The WHO has reported at least 15 ongoing projects to produce effective vaccines, though none have reached clinical trials. It is estimated that another two years will be required to develop a vaccine and five times longer for it become available to the general public and developing countries where treatment is most needed. WHO's Strategic Response Plan stresses further research beyond the purely health-related considerations, around economic and environmental considerations, including modeling of potential scenarios to estimate the impact of spread and economic costs.

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