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Trade and Economic Growth

25 Years of a Stronger Relationship within APEC

By Carlos Kuriyama and Emmanuel San Andres



Not only has economic growth in APEC always been more synergistic to trade growth than the rest of the world, it also became more synergistic after 1989.

Since its inception in 1989, APEC has been working on initiatives to promote its objectives of sustainable growth and equitable development, with the ultimate aim of improving the well-being of its member economies and strengthening the Asia-Pacific community.

A vision of economic openness, which stimulated the launch of the Bogor Goals of free and open trade and investment, has been supporting the implementation of several initiatives in pursuit of these goals. Many of them, which encompass topics related to trade and investment liberalization, as well as business facilitation, are critical steps to achieve the aforementioned objectives.

There is no doubt that APEC has made a contribution to growth and development. While we cannot claim that APEC, and its initiatives, have been solely responsible of the economic achievements and outcomes attained so far, we can say that APEC has inspired governments to carry out policies to improve market conditions, which have been vital to promote growth and development in the Asia-Pacific region.

The purpose of this Policy Brief is to explore the correlation between trade and the gross domestic product (GDP) within APEC and show the importance that trade plays in APEC's economic growth *vis-à-vis* the rest of the world. This brief does not seek to analyze the causation between trade and growth or to find statistically significant determinants that can explain growth in the region. The economic literature has identified many other aspects besides trade, such as geographic characteristics, quality of institutions, demographic factors, educational levels, macroeconomic stability, and infrastructure investment, among others, which could play an important role in growth as well¹.

In this Policy Brief, our focus is on exploring the role of trade as one of the main components of economic growth in APEC, based on: 1) the relevance of trade within APEC's agenda since its early stages in order to achieve its objectives of sustainable growth and equitable development; and 2) the recognition of trade as one of the principal growth drivers in the APEC Growth Strategy initiative endorsed by Leaders in 2010². Frankel and Romer (1999) already found a positive relationship between trade and income (and GDP)³. However, we will show that this relationship has been stronger in APEC than in the rest of the world since APEC was established 25 years ago, back in 1989.

Trade as a Source of Economic Growth

Why do economies trade? Answering this question helps to understand the reasons trade is important for economic growth. A very basic and intuitive reason is that trade allows economies to be better off by allowing them to buy from others what they cannot produce themselves and sell what they have that others do not. The theory of comparative advantage, developed by David Ricardo in the 19th century, says that, with trade, economies could specialize in the production of goods in which they have comparative advantages, and be able to consume more than in a scenario without trade. It is inferred that goods can be produced in a more efficient and relatively less costly way with trade. This, in turn, would also help economies to increase their incomes.

For economies, the specialization will depend on factors such as the availability of specific natural resources, and the accessibility and productivity of inputs such as labor, capital, land and technology. In this way, economies with relatively abundant labor will export labor-intensive goods to economies with relatively abundant capital and import from them capital-intensive goods. This, however, only explains part of the motivations to trade, since trade across economies is not just inter-industry but also intra-industry, which means that economies with similar endowments of factors of production could also export and import simultaneously the same type of good. For example, a developed economy exporting cars to another developed economy could also be importing cars from that same economy.

Intra-industry trade could be explained for many reasons. Goods in the same category are not necessarily identical (e.g. laptops could differ in their technical characteristics or be simply from distinct brands). Firms also seek efficiency and take advantage of economies of scale, by concentrating their production of very specific products in one or few locations where they have an edge, instead of producing a wide array of products in any place (e.g. an agricultural company producing yellow potatoes in one economy and white potatoes in another one, instead of producing both types in both locations). Also, firms make trade dynamic, by investing in research and development and constantly releasing new products within the same line in order to generate profits (e.g. companies developing new mobile phone models).

Trade is thus an important source of economic growth. External demand encourages the production of local goods in order to be exported later, spurring domestic economic activity. However, imports are not necessarily bad for the economy as they bring economic benefits by providing consumers and firms with a greater selection of goods to choose from. Economies need local and foreign intermediate goods, such as raw materials and parts and components, to produce consumer goods. The availability of imported intermediate products could also improve productivity and export competitiveness⁴. Moreover, imports of capital goods (i.e. machinery and equipment) could contribute to economic growth by increasing the production capacity in an economy. Less barriers to imports could also facilitate technological transfers and contribute to higher growth rates in the future⁵.

Growth depends on both domestic and external sources, but according to the World Bank (2005), a common element that is present in economies that have been successful in attaining sustainable growth is that they have increased their openness to trade and reduced trade barriers⁶. Domestic forces by themselves seem not to be enough to support economic growth in time, and empirical findings seem to support the World Bank's viewpoint. For example, Edwards (1997) used a dataset of 93 economies and found that more open economies had experienced faster productivity growth⁷. Similarly, Wacziarg and Horn Welch (2008) noted that during the period 1950-1998, economies that liberalized their trade regimes grew at faster average annual rates after than before liberalization (about 1.5 percentage points higher)⁸. More recently, Gries and Redlin (2012) analyzed the period 1970-2009 for 158 economies and found evidence of a long-run positive relationship between openness and economic growth⁹.

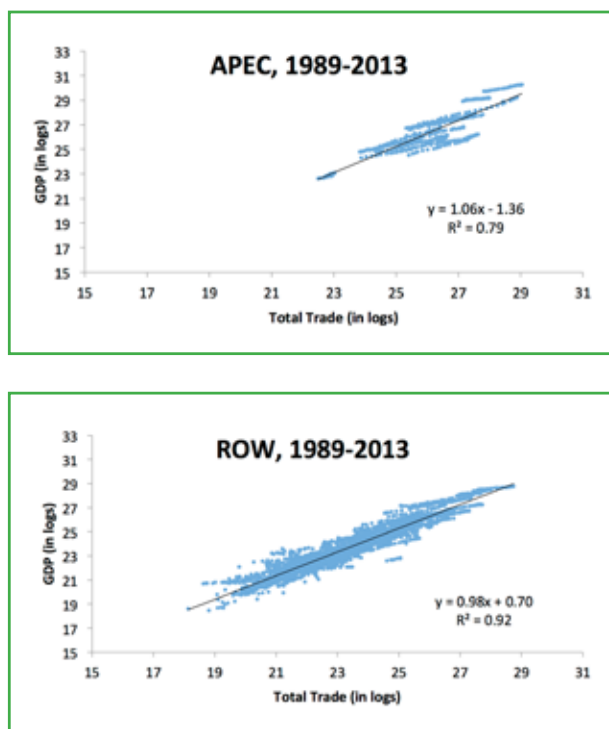
The findings in these studies support APEC's role in promoting trade as a means towards achieving sustainable growth. In fact, APEC economies have been very active in finding ways to open their markets, through unilateral trade liberalization efforts, or negotiated efforts at the regional, bilateral or multilateral levels. A study released by the APEC Policy Support Unit in 2009 found that intra-regional trade was proportionally larger in APEC than in other well-consolidated regional groupings such as the European Union, and suggested that APEC was enjoying the benefits of a *de facto* (i.e., market-driven rather than treaty-based) integration, part of which could be related to initiatives in trade liberalization and facilitation¹⁰. Also, it indicated a positive APEC membership effect on trade, which was stronger in exports than imports. This is a possible reflection of APEC's open regionalism approach which minimizes discrimination against non-APEC economies¹¹.

Trade and Growth in the APEC Region

To empirically explore the relationship between trade and growth in APEC, we gathered data on GDP, imports, and exports for the period 1989-2013. All GDP and trade data are expressed in 2005 US dollars to control for inflation effects¹².

A visual analysis of the data shows that there is a strong and positive correlation between total trade (i.e., exports plus imports) and growth. As can be seen in Figure 1, this is true both for APEC economies and the rest of the world (ROW). This confirms the earlier discussion on the close link between trade and GDP. Moreover, we can also see that APEC has a steeper trend line than ROW, as indicated by the slope of the trendline equation¹³. This shows indicatively that domestic economic production is more strongly correlated to international trade in APEC economies than in the rest of the world.

Figure 1: Scatterplot of GDP and Trade Data, 1989-2013



Source: APEC Secretariat, Policy Support Unit estimates.

In order to more precisely measure the relationship between GDP growth and trade growth, we calculate the trade elasticity of growth in APEC and the rest of the world. In other words, we estimate, in a specific period, how much in percentage terms an increase in GDP is associated with a 1% increase in trade, controlling for economy level-fixed effects as well as year-specific effects¹⁴.

Table 1 shows the results of the estimations and provides the average elasticities for APEC and ROW over the specified period. It can be seen that for all time periods, average elasticities are higher for APEC than ROW. In the period 1989-2013, a 1% growth in trade in APEC is correlated with 0.56% growth in GDP, while for the rest of the world a similar increase in trade is associated with 0.39% GDP growth. To put these figures in perspective, in 1989-2013, a 1% increase in trade in APEC was linked to an additional GDP of \$123 billion (in 2005 US dollars), all other factors held constant. A similar 1% increase in trade in the rest of the world was linked to an additional GDP of only \$68 billion.

Table 1: Trade Elasticity of Growth

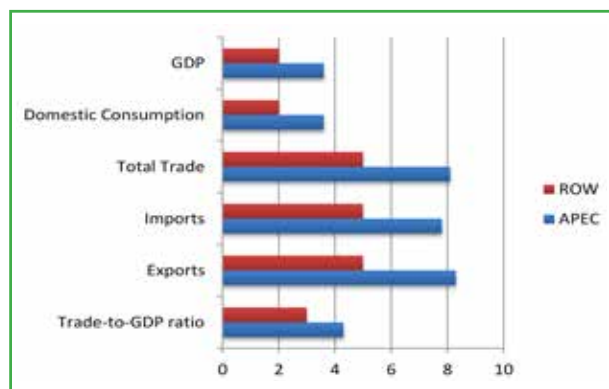
Period	Elasticity (in %)	Observations	Overall R ²
APEC Economies			
1960-1988	0.428	376	0.687
1989-2013	0.565	453	0.783
Rest of the World			
1960-1988	0.305	1,914	0.737
1989-2013	0.389	2,878	0.886

Note: All elasticity estimates are statistically significant at $\alpha = 1\%$.
Source: APEC Secretariat, Policy Support Unit estimates.

One can also argue from Table 1 that APEC economies have always had a higher trade elasticity of growth compared with the rest of the world. Indeed, in the three-decade period prior to 1989, a 1% increase in trade in APEC economies was correlated with a 0.43% growth in GDP, while in ROW a similar 1% increase in trade was only correlated with a 0.31% increase in GDP. This indicates that GDP growth in APEC economies has always been more strongly linked with trade compared to the rest of the world, even before APEC's existence. However, the difference in elasticity estimates before and after 1989 provides an interesting story: while the ROW elasticity increased from 0.305 to 0.389 (8.4 basis points), it increased in APEC from 0.428 to 0.565 (13.7 basis points). So not only has economic growth in APEC always been more synergistic to trade growth than the rest of the world, it also became more synergistic after 1989.

Trade has been growing at a faster pace than GDP in general. In 1989, both APEC exports and imports together were equivalent to 20% of the APEC GDP. By 2012, this figure went up to 52.4%. As seen in Figure 2, trade and GDP in APEC have been growing at a markedly faster rate than in ROW. Trade-to-GDP ratios are also growing faster in APEC economies than ROW, indicating that trade is increasingly becoming more important in APEC compared to the ROW.

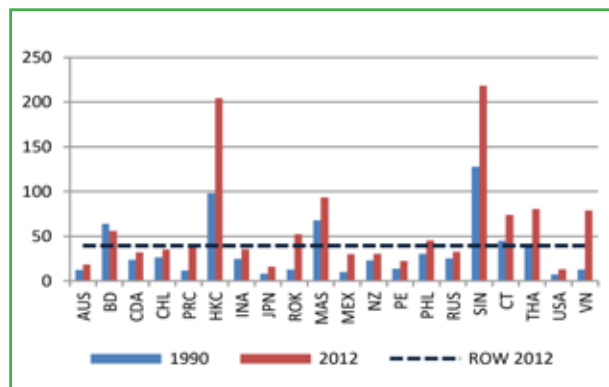
Figure 2: Average Annual Growth Rates, 1989-2012 (in percent)



Note: Average annual growth rates are calculated using the compound annual growth rate method. Domestic consumption is the sum of household consumption, government expenditure, and domestic investment. Growth rates were calculated from indicators in 2005 constant USD. Source: APEC Secretariat, Policy Support Unit estimates.

The nexus of trade and GDP growth in APEC points to the importance of trade in the whole region. As seen in Figure 3, the ratio of trade-to-GDP increased in almost all APEC members (except for one) from 1990 to 2012, which reflects the increasing importance of the external markets as source of economic growth in almost all APEC economies since APEC's inception. However, in the case of eleven APEC economies, the trade-to-GDP ratio is lower than the ROW average in 2012. This is particularly common in APEC economies with large domestic markets, which have a stronger reliance on domestic consumption to drive and sustain economic growth.

Figure 3: Total Trade-to-GDP Ratio, 1990 and 2012 (in percent)



Note: Trade data is not available for Papua New Guinea. Source: APEC Secretariat, Policy Support Unit estimates.

More dynamic and liberal economic policies have made both imports and exports correlated with GDP growth in APEC. Performing the same elasticity analysis we did earlier, but this time disaggregating exports and imports from total trade¹⁵, we find that exports and imports growth are significantly and positively correlated with GDP growth in APEC economies (Table 2). This is an interesting result as it shows there is no association between an increase in imports and the fall of domestic economic activity, which is one of the arguments commonly used by opponents of trade liberalization¹⁶.

Table 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 $\alpha = 1\%$

Source: APEC Secretariat, Policy Support Unit estimates.

The positive elasticity for imports in APEC confirms that imports should not necessarily be seen as harmful for economic growth. As opposed to the mercantilist viewpoint which supports a protectionist and zero-sum stance, APEC has followed a pattern of economic openness and imports within APEC have contributed to GDP growth by giving access to producers and consumers to more products at lower price and by helping to increase productivity and export competitiveness.

For the ROW, only exports growth is significantly and positively correlated with GDP growth. In contrast, imports growth has no statistically significant correlation with GDP growth. In other words, while a 1% increase in exports is associated with a 0.34% increase in GDP in the ROW, a 1% increase in imports does not seem to be associated with GDP growth. In comparison to the APEC region, the ROW faces higher trade barriers that may be explaining this difference. For example, based on information from the World Trade Organization's World Tariff Profiles, the average tariff rate in APEC (5.7%) was much lower than in that of the ROW (10.1%) in 2012. Similarly, according to World Bank's Doing Business database, the median costs and times to import a container in APEC in 2013 were equal to USD 770 and 11 days, far cheaper and shorter than in the ROW (USD 1,443 and 21 days).

It is possible that imports in APEC are contributing to domestic production and growth through global supply chains that most of the ROW 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. APEC initiatives in business facilitation and trade liberalization—such as the Trade Facilitation Action Plan I and II, the Supply Chain Connectivity Framework, the Investment Facilitation Action Plan, the APEC Ease of Doing Business and the APEC Environmental Goods List, among others— have inspired governments to implement policies that are making it easier for companies to establish the aforementioned practices. While digging into this peculiar behavior of imports in APEC is beyond the scope of the current policy brief, it is worth investigating further especially in the context of foreign investment and regional connectivity.

Concluding Remarks

It is of no surprise that trade and GDP growth are strongly interlinked. However, what we have set out in this policy brief is to show that this linkage is stronger in APEC than the rest of the world, and has been getting stronger since APEC was established in 1989. An analysis of the data shows that the APEC region is indeed one of the most vibrant and dynamic in the world. Not only is GDP growth more responsive to trade in the region, but trade has also been increasing in importance as a component of GDP. While this has been happening all over the world, this interdependence among economies is more vividly seen in APEC than in the rest of the world.

It is worth pointing out that many of the changes that happened in the APEC region occurred after 1989—the year APEC was established, such as the trade liberalization policies that led to the globalized world of today. However, we need to avoid an after-the-fact argument: we cannot rigorously attribute the observed impacts on the APEC region to the existence of APEC as an organization or its initiatives. To do so would require counterfactual analysis — what would have happened if APEC never existed — which is impossible in a macroeconomic setting. Any assumptions to examine this matter would be artificial and arbitrary.

This is the common problem of attribution faced by most international organizations: how do we know that observed economic impacts have been because of what we did rather than what everyone else did? Strictly speaking, we cannot. But we can say that our actions and initiatives have plausibly contributed towards achieving these impacts. When APEC was established in 1989, it had the vision of promoting free trade and economic growth in the region. Many initiatives since then, such as the Bogor Goals in 1994, have been or are being implemented, and the desired impacts of faster and more trade-linked economic growth seem to be trickling in.

While APEC cannot claim sole credit for the vibrancy and dynamism of the region in the past 25 years, it can gain satisfaction from the fact that it has served as an inspiration to promote and implement open trade and investment policies. After 25 years, APEC will continue to be an important incubator of ideas. This is evident by looking at the discussion topics which have gained relevance in the APEC agenda in recent years, such as global value chains, connectivity (physical, institutional and people-to-people), and strengthening regional economic integration. Progress on these initiatives will definitely help APEC realize the objectives it set in its early years.

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Notes

¹ For example, see Barro, Robert J., "Determinants of Economic Growth: A Cross-Country Empirical Study", 1996, NBER Working Paper 5698; Dollar, David and Aart Kraay, "Institutions, Trade and Growth: Revisiting the Evidence", March 2003, World Bank, Policy Research Working Paper 3004; Rodriguez, Francisco and Dani Rodrik, "Trade Policy and Economic Growth: A Skeptic's Guide to the Cross-National Evidence", published at Ben S. Bernanke and Kenneth Rogoff (eds), *NBER Macroeconomic Annual 2000, Volume 15*, January 2001, p. 261-325.

² The APEC Growth Strategy also acknowledges the complexity of growth, by identifying five attributes desirable for economic growth. These components are as follows: 1) balanced growth, which relates to macroeconomic stability, infrastructure development and structural reforms; 2) inclusive growth, which includes policies to enhance social resilience and promote human resources development, a healthy labor market, SME development, access to finance and opportunity for women; 3) sustainable (green) growth, which encompasses efforts to protect the environment and promote low-carbon policies, including green industries and jobs; 4) innovative growth, which seeks to promote innovation and knowledge; and 5) secure growth, which aims to provide a safe environment for economic activity by minimizing natural and human risks to growth

³ See Frankel, Jeffrey A. and David Romer, "Does Trade Cause Growth?" *American Economic Review*, Vol. 89, No. 3, June 1999, p. 379-399.

⁴ For further details, please see OECD, "How Imports Improve Productivity and Competitiveness", May 2010.

⁵ See Humpage, Owen F., "Do Imports Hinder or Help Economic Growth?", Federal Reserve Bank of Cleveland, 15 March 2000, available at <https://www.clevelandfed.org/research/commentary/2000/0315.htm>. The author explains with details on how imports could help to promote economic growth. In his conclusions, he argues that "imports do not reduce or slow economic growth". On the contrary, he mentions that "by fostering specialization and the transfer of technology, they lead directly to faster economic growth and improved standards of living".

⁶ For further details, see World Bank. "Economic Growth in the 1990s: Learning from a Decade of Reform", April 2005, chapter 5, p. 133-155. This study also recognizes that trade is an opportunity and not a guarantee for growth and trade reforms could bring redistributive issues and require economies to find ways for affected domestic groups to make the transition. For example, assisting workforce to move from contracting to expanding economic sectors. In this regard, APEC has noted this concern and the development of the APEC Growth Strategy provides the framework for actions/policies that need to complement trade reforms in order to ensure that growth can be sustained in time.

⁷ See Edwards, Sebastian, "Openness, Productivity and Growth: What Do We Really Know?" March 1997, NBER Working Paper 5978. This paper analyzes three possible determinants of Total Factor Productivity (TFP) growth: GDP per capita, human capital and openness. Edwards used nine different openness indexes reflecting trade distortions, including average black market premiums, average import tariffs on manufactures, collected trade taxes ratios, among others, and found that economies with "a higher level of trade distortions have had lower TFP growth" (p. 11).

⁸ See Wacziarg, Romain and Karen Horn Welsh, "Trade Liberalization and Growth: New Evidence", *The World Bank Economic Review*, Vol. 22, No. 2, 2008. p. 187-231.

⁹ See Gries, Thomas and Margarete Redlin, "Trade Openness and Economic Growth: A Panel Causality Analysis", Working Papers CIE 52, University of Paderborn, CIE Center for International Economics.

¹⁰ See Lee, Hyun-Hoon and Jung Hur, "Trade Creation in the APEC Region: Measurement of the Magnitude of and Changes in Intra-regional Trade since APEC's Inception", APEC Policy Support Unit, October 2009, p. i-ii, p.37. This paper shows that the share of intra-regional exports and imports was higher in APEC than in the European Union between 1989 and 2007. In 2007, the share of intra-regional exports in APEC was equal to 67.5 percent, while for the EU, its intra-regional exports accounted for 66.7 percent of their total exports. Similarly, the share of intra-regional imports in APEC and the EU were equal to 66.5 and 63.4 percent respectively.

¹¹ Ibid, p. 29.

¹² Data for most APEC economies and the rest of the world are taken from the World Bank's World Development Indicators Database, while data for Chinese Taipei are from the Directorate-General of Budget, Accounting and Statistics.

¹³ The equation is in the form $y = bx + a$. In this form, "b" refers to the slope of the trendline, while "a" is the intercept. A higher figure for "b" indicates a steeper slope.

¹⁴ To do so, we econometrically estimate a simple model through panel ordinary least squares (OLS) as follows:

$$Y_{it} = a + bT_{it} + e_{it}$$

where Y_{it} is the log of GDP (in 2005 US dollars) of economy i during year t ; T_{it} is the log of total trade (i.e., imports plus exports) of economy i at year t , and e is the random error term. Economy-level effects are controlled through the fixed effects specification of the panel OLS, while year-specific effects are controlled using year dummy variables. We use robust Huber-White standard errors to correct for heteroscedasticity in the data. Given Y_{it} and T_{it} data are specified in natural logarithm form, the estimated coefficient b becomes the elasticity of trade to growth, so a 1% growth in total trade is associated with $b\%$ growth in GDP. To show this, note that $dY/dT = b$. Given that Y and T are expressed in natural logarithms, then $dY = dY/Y$ and $dT = dT/T$. Hence, $dY/dT = (dY/Y)/(dT/T) = b$ which is the technical definition of elasticity.

¹⁵ In this case, we econometrically estimate a model through panel ordinary least squares (OLS) as follows:

$$Y_{it} = a + bX_{it} + cM_{it} + e_{it}$$

where Y_{it} is the log of GDP (in 2005 US dollars) of economy i during year t ; X_{it} is the log of exports of economy i at year t , M_{it} is the log of imports of economy i at year t , and e is the random error term. Economy-level and year-specific effects are controlled as before, and robust Huber-White standard errors are used. In this case, estimates for "b" and "c" are the export and import elasticities of GDP, respectively.

¹⁶ By looking at the accounting identity to calculate the GDP:

$$GDP = \text{Consumption} + \text{Investment} + \text{Government Expenditure} + \text{Exports} - \text{Imports}$$

It seems clear that an increase of imports would reduce GDP. Nevertheless, this is not necessarily the case, since the relationship between imports and GDP is dynamic. As explained in this Policy Brief, imports could help to improve productivity, export competitiveness and increase the production capacity of an economy. In addition, higher production (and income) also raises the demand for imported goods.



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