

The US-Asia Economic Relationship: Policy Implications of Recent Trends in Trade, Foreign Direct Investment, and Patenting

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Abstract: This paper examines trends in trade, foreign direct investment (FDI), and innovative activity in Asia during 1990-2014, paying special attention to the evolution of the bilateral economic relationship between Asia and the United States (US). By almost all measures, there has been a fairly remarkable increase in the collective economic clout of Asian countries. In 1990, while Asian countries together accounted for just over 24% of global output, by 2014 their share had risen to 34%. While per capita income of Asian countries in 1990 was about 7% of that of the US, this ratio increased to over 11% in 2014. Over the same period, Asian countries saw their share of world merchandise exports increase rather dramatically (from 25% to almost 41%). China was the key driver of this surge in exports of Asian countries. At a bilateral level, trade between the US and Asia almost doubled from 1990 to 2014 but Asian trade with rest of the world increased to an even greater degree. In 2014, the US sourced 43% of its imports from Asia in 2014 while Asia absorbed 30% of US exports. During 2010-14, Asian countries attracted roughly 32% of global FDI flows and about 23% of the global stock of inward FDI now resides in Asia. Investments in research and development (R&D) as well as local patenting activity in Asian countries have also increased significantly. In fact, China alone accounted for approximately 35% of all patent applications filed in the world during 2014. Policy frictions between the US and Asia continue to manifest themselves as antidumping duties as well as in the form of trade disputes filed at the WTO. It is noteworthy that other than South Korea, the US does not currently have a bilateral trade or investment treaty with any major Asian country. With the fate of the proposed Trans-Pacific Partnership – a comprehensive trade agreement between the US and 11 Pacific Rim countries cutting across a range of issues – now essentially sealed, the future evolution of international economic cooperation between the US and Asia seems uncertain at best. In light of the evidence discussed in the paper, it seems that, at least within the sphere of international economic policy, the proposed “policy pivot” of the US toward Asia is yet to take tangible form.

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1. Introduction

The continent of Asia comprises 45 countries that differ dramatically in terms of their economic, political, social, and geographic conditions. On the population spectrum, it includes behemoths such as China and India as well as tiny countries such as Bahrain and Maldives. While per capita incomes in most Asian countries are relatively low by global standards, Asia includes some fairly rich countries such as Kuwait and Qatar whose per capita real incomes exceed those of many Western countries.³ Politically, Asia is remarkably diverse: it includes the world's largest democracy (India), the largest country under the control of a single political party (China), and also small kingdoms such as Bhutan and Brunei. All of the major religions of the world are present in Asia, many of them having originated there, with Islam and Hinduism being its two most popular faiths. Over 60% of the global population resides in Asia and the US and Asia together account for roughly half the global economy. Thus, bilateral ties between the US and Asia affect not just them but also the rest of the world.

Economic and political ties between the US and Asian countries have a long and chequered history, which includes periods of sustained mutual cooperation as well as episodes of serious conflict. Sometimes, war has given way to robust bilateral trade and cooperation in a fairly short period of time. For example, within a few decades of being embroiled in brutal conflict during the Second World War, the US and Japan were engaged in significant bilateral trade and investment. Trade between the two countries grew so quickly during the post war era that their bilateral trade imbalance became a leading policy issue in the US as early as the 1970s, prompting the development of a huge literature aimed at addressing the "Japan problem". In some ways, the preoccupation that one witnesses in the US today regarding its trade with China is reminiscent of past US-Japan trade relations.

In this paper, we study the evolution of the bilateral economic relationship between Asia and the US over the last twenty five years or so (1990-2014). To put this bilateral relationship into proper context, we begin by examining Asia's role in the global economy (as measured by its trade and investment ties with the rest of the world) evolved over 1990-2014, a period of remarkable change from a variety of perspectives. We also consider recent changes in R&D investments in Asian countries as well as in innovative activity as measured by patenting (both locally and abroad).

With an overview of Asian engagement in the global economy in hand, we turn to a closer examination of the bilateral relationship between the US and Asia. We also consider policy frictions between the US and Asia as measured by tariffs, antidumping activity, and

³ There is large variation in per capita income across Asian countries. For example, in 1990 the ratio of per capita income between the richest country in Asia, i.e. the UAE, and one of the poorest countries (Myanmar) was as high as 576! Although this ratio became smaller in 2014, it remained as high as 146. By contrast, Europe and the Americas exhibit much lower levels of income dispersion.

international trade disputes between them adjudicated by the World Trade Organization (WTO).

Our analysis provides several interesting insights:

- While rapid economic growth in several large countries in Asia (notably China) has substantially increased Asia's global economic clout in terms of its overall economic size, the per capita real income of most Asian countries still lags substantially behind that of rich Western countries.
- The economic pie in Asia has not just grown, it has also been reallocated substantially: China has gained in prominence, particularly relative to Japan, while South Korea has held steady.
- While Asia's exports to the rest of the world in 1990 were roughly twice that of the US, they grew at a much faster rate so that by 2014 Asian exports were roughly four times that of the US. On the import side, Asia has grown in prominence as well although its rise has been less dramatic: Asia's share of global imports increased from 26.1% in 1990-94 to 37% in 2010-14 while that of the US declined slightly from 14.8% to 12.5%.
- Within Asia, the distribution of exports and imports across countries has changed rather dramatically over time: China saw its share of Asian exports surge from 8% in 1990-94 to 28% in 2010-14 while Japan saw its share decline from 31.4% to 10.5%. On the import side, China's share increased from 8.2% to 26.5% while that of Japan fell from 24.2% to 12.2%, a clear indication of the growing importance of China as a destination market for global exports.
- Though the absolute level of trade between Asia and the US has increased substantially (at an average annual growth rate of roughly 6.6%), Asia's share in US foreign trade has been relatively steady at around 36%. The share of US imports sourced from Asia has tended to hover around 41% and that of US exports destined for Asia around 30%. Thus, from the American perspective, the *relative* importance of Asia over the time period under study has not changed significantly.
- From the Asian perspective, the importance of the US market relative to rest of the world seems to have actually diminished over time: the US's share in Asian imports from the rest of the world fell from 14.3% in 1995 to just 6.7% in 2014 while the percentage of Asian exports sold in the US also declined rather sharply (from 22.9%

to 13.2%). These figures suggest that, from a trade perspective, Asia has become less reliant on the US. This change in the global economic landscape could have important implications for trade policies of both regions. In particular, one wonders whether US trade policy towards Asia needs to become more proactive in terms of strengthening economic ties between the two regions.

- Within Asia, China has replaced Japan as the dominant exporter to the US: while in 1990, the US sourced 42% of its Asian imports from Japan and only about 11% from China, by 2014 the roles of the two countries had essentially been reversed with the US sourcing over 45% of its Asian imports from China and just over 14% from Japan.
- In the domain of foreign direct investment (FDI), Asia is not (yet) the most important partner of the US.⁴ While FDI flows between Asia and the US have increased over time, much of the stock of US owned FDI still lies in Europe. Similarly, the bulk of the FDI stock in the US is owned by European countries. Among Asian countries, Japan continues to be the largest source of FDI into the US.
- China and South Korea have significantly increased their investments in research and development (R&D) while Japan has sustained its high rate of R&D investment. These are welcome developments not just from the perspective of the US but also the rest of the world. Scientific knowledge and technical know-how resulting from these investments will contribute to the global pool of knowledge and help raise living standards world-wide.
- Innovation and patenting links between Asia and the US are significant and have been increasing over time. Asian countries now account for a majority of the patent applications filed by foreign residents at the USPTO. These developments might afford new opportunities for increased US-Asian cooperation in the realm of intellectual property, an area that was characterized by significant policy frictions between the two regions in the pre-TRIPS era.
- US MFN tariffs have been low for some time and many Asian countries have reduced their tariffs on US products over the last few decades. Yet, both regions frequently use antidumping duties against each other. For example, over 2010-14 more than 3/4th

⁴ FDI refers to an investment made by an investor in a foreign country to acquire lasting interest in a local enterprise. FDI differs from portfolio investment in that it typically reflects the long term strategies of investors and tends to be more irreversible in nature, particularly *greenfield* investment that is generally accompanied by the construction of new plants and investment in new equipment.

of the antidumping cases filed in the US targeted Asian imports, with China accounting for almost 40% of such cases. While AD duties allow governments to relieve domestic political pressures, they come with significant economic costs and also lower the gains achieved through the decline in the use of traditional trade policy instruments such as import tariffs.

- At the multilateral level, during 2010-14 more than half the trade disputes initiated by the US at the WTO were against Asian countries while the US was the defendant in about 30% of the disputes initiated by Asian countries. These numbers seem a bit high when evaluated in the context of the degree of bilateral trade between the regions.
- The US is currently party to twenty free trade agreements (FTAs) with other countries. Less than 25% of the total trade of the US is with countries with whom it has signed trade agreements. Furthermore, the US has signed FTAs with only a few Asian countries, most of them rather small. In fact, the only large Asian country with which the US has an FTA is South Korea and this agreement was ratified just a few years ago (i.e. in 2012). Given the increasing importance of Asia in the global economy, the lack of international trade agreements between the US and its major trading partners in Asia is a bit puzzling. One wonders whether US trade policy is a bit out of sync with fundamental changes in the global economic landscape that have occurred over the last twenty five years or so.
- With the fate of the Trans-Pacific Partnership now essentially sealed, it is difficult to see President Obama's proposed "policy pivot" to Asia materializing within the sphere of international economic policy anytime in the near future. For that to happen, there would need to be a dramatic turnaround in the current political atmosphere in the US which seems to be becoming anti-trade at a fairly alarming rate.

2. Asia in the Global Economy

2.1. Economic growth in Asia

Back in 1990, Asian countries together accounted for about a quarter of global GDP and Asia ranked as the third largest economic continent behind Europe and North America. Due to rapid economic growth in the region, by 2014 Asia's share of the global economy had increased to over one third. In particular, Asia's annual growth rate of real GDP over 1990-2014 was a healthy 4.1% relative to the global growth rate of 2.6%.

Asia's rising fortunes are mirrored by the relative decline of Europe, which saw its share of global GDP decline from 38.2% in 1990 to 28.3% in 2014. Over the same time period, the US too suffered a decline in its relative economic standing in the world, albeit a more modest one, with its share of global GDP falling from 26.2% in 1990 to 22.5% in 2014. At a bilateral level, Asia gained significant ground relative to the US: while in 1990 the Asian economy was a bit smaller than that of the US, by 2014 it was one and a half times as large as the US economy.

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As one might expect, the rise of Asia was driven in large part by the rapid economic growth of China. Indeed, China's average annual growth rate of real GDP over 1990-2014 was a remarkable 10.1%, a number that was more than twice that of the Asian average growth rate and almost four times as high as the global average growth rate over the same time period. China's rapid ascent within Asia is evident from the fact that while it accounted for only 7.3% of Asia's total GDP in 1990, its share had surged to 40.1% by 2014.

Within Asia, Chinese economic preeminence has come partly at the expense of Japan whose share of Asian GDP declined significantly from 56.9% in 1990 to 17.7% in 2014. Figure 2 below presents two snapshots that illustrate the reallocation of the Asian economic pie amongst its major countries that has taken place over the last twenty five years or so. Other than the remarkable emergence of China and the relative decline of Japan, the shares of other major Asian countries did not change dramatically: India's share increased moderately from about 5.9% to 7.9% while that of South Korea remained steady around at 5%.

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Since living standards of individual citizens are more accurately measured by per capita income, as opposed to the overall size of a country's economy, it is useful to consider the evolution of GDP per capita of Asia and its various countries. Table 1 presents the evolution of per capita real income of Asian countries relative to the US.

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While in 1990, per capita real income in Asia was under 7% of that of the US, by 2014 it was just over 9%. This is a fairly modest level of increase in a base number that was small to begin with. Thus, while Asia has gotten economically larger, on average it has *not* gotten

significantly richer, at least not yet. However, much of the increase in the Asian per capita real income was driven by China whose per capita real income grew at an impressive 9.3% over 1990-2014. By contrast, the average growth in per capita real income in Asia was under 3% over the same time period. Although China's per capita real income remains below Asia's average, the ratio between the two increased from roughly 21% in 1990 to 93% in 2014, i.e., Chinese per capita real income in 2014 was roughly equal to the Asian average. Furthermore, China made impressive strides relative to the US: while in 1990 its per capita real income was only 1.4% that of the US, by 2014 this ratio had increased to 8.5%. This is an impressive achievement over a fairly short period of time, especially for a country with over 1 billion citizens.

2.1. Evolution of Asian Trade

Over the time period under study, Asian involvement in world trade increased in not only absolute terms but also relative to that of the US.⁵ As Figure 3 shows, in 1990 Asian exports to the rest of the world were little more than twice that of the US but by 2014, they were roughly four times as large.

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Due to the rapid growth of its exports, Asia is now a major presence in world trade (see Table 2 below). While Asia's share in world merchandise exports was 28.7% over 1990-94, by 2010-14 its share had crossed 40%. In relative terms, both the US and Europe lost ground to Asia: Europe's share of global exports fell from 47.4% over 1990-94 to 38.4% over 2010-14 while that of the US declined from 11.9% to 8.3%.

--- Table 2 here ---

Not only did Asian exports to the rest of the world surge, their distribution across Asian countries also changed significantly. While only 8% of Asian exports over 1990-94 originated in China, by 2010-14 China had become the largest exporter in Asia accounting for 28% of Asian exports. China's increased prominence in Asian exports came partially at the expense of Japan, whose share fell rather precipitously from 31.4% to 10.5%.⁶

⁵ In what follows, we focus on merchandise trade. While services are becoming increasingly important in international trade, we do not have good data on the services trade of individual Asian countries.

⁶ We should note here that the absolute value of Japanese exports did increase moderately over this time period, it is just that Chinese exports literally exploded.

Another perspective at Asian exports can be gained by examining how the share of top 5 exporters has changed over time. The key finding here is that Asian exports have tended to become slightly less concentrated over time. The share of the top ten exporters in Asia fell from 85.4% over 1990-94 to 78.8% over 2010-14.

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Asia's share in the total world imports increased from 26.1% over 1990-94 to 37% over 2010-14, which is roughly the same as that of Europe whose share of world imports fell from 47.2% to 37.1% over the same period while that of the US declined from 14.8% to 12.5%. Through-out the time period under study, Asia has continued to enjoy a trade surplus viz-a-viz the rest of the world.

The evolution of imports shares of individual Asian countries has been fairly similar to their exports, with the increasing prominence of China and the relative decline of Japan once again being the main story: over 1990-94, while China's share in Asian imports increased from 8.2% to 26.5% that of Japan fell from 24.2% to 12.2%. The second noteworthy fact is that India entered the list of top five Asian importers during 2010-14 since its share increased from 2.3% to 6.7%.

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It is generally recognized that in today's global economy, trade between subsidiaries and headquarters of multinational firms, may account for over one-third of total world trade. Indeed, FDI is the dominant channel through which firms serve their customers in foreign markets and sales of subsidiaries of multinational firms exceed worldwide exports of goods and services. Given this, it is useful to briefly explore Asia's experience with FDI both in absolute terms as well as relative to rest of the world.

2.2. Flows and Stocks of Foreign Direct Investment

The key distinguishing feature of FDI is that it transfers control of local enterprises to foreign hands. Sometimes FDI occurs via the establishment of wholly-owned subsidiaries of multinational firms whereas at other times it involves shared ownership between local and foreign firms in the form of international joint ventures. As a result, FDI inflows are valuable not just because they bring in capital but also because they are frequently accompanied by international technology transfer: while FDI in the form of mergers and acquisitions is more likely to yield productivity improvements via changes in the management and organization structure of acquired firms, greenfield FDI leads to the introduction of technologies that

allow host countries to produce entirely new products or improve their existing production processes.⁷

Over time, Asia has become an increasingly important destination for inflows of global FDI: Asia's share of such inflows increased from 21.7% over 1990-94 to 32% over 2010-14. By contrast, both the US and Europe saw their shares of global FDI inflows decline. These changes in FDI inflows are also reflected in the allocation of the global stock of FDI. Asia's share of the global FDI stock increased from 16.1% in 1995 to 24.4% in 2014.

Asia has also become a more important source of FDI even though these outward flows have not increased smoothly over the years. The share of Asia in global FDI outflows increased from 20.6% over 1990-94 to 32.9% over 2010-14. Indeed, Asia's share over the latter time period was fairly similar to that of Europe (35.5%). Asia's share in global outward FDI stocks also increased significantly (from 12.2% in 1991 to 22.2% in 2014) while that of the US and Europe declined.

With this overall picture of Asian engagement in international trade and FDI in mind, we now examine the evolution of innovative and patenting activities in Asia.

2.3. Innovative activity and patent protection in Asia

During the Uruguay Round negotiations (1986-1994), China was not a member of the GATT and many Asian countries, especially India, were opposed to any strengthening of patent protection in the global economy. But with the ratification of the Agreement on Trade Related Aspects of Intellectual Property Rights (TRIPS) most developing countries had to significantly alter their IPR policies in order to make them compatible with TRIPS although they were given a grace period of 10 years to implement these changes. For example, India introduced significant patent reforms in 2005. Prior to 2005, India did not recognize product patents for pharmaceuticals. As a result, reverse engineering and imitation were rampant in India and were the key drivers behind the development of its robust pharmaceutical industry. The explicit recognition of product patents in 2005 made an imitation-based development strategy unviable for India. Like many other Asian countries, the focus of policy-making in India now seems to have shifted towards encouraging collaboration with multinational firms in order to increase local industry's participation the global R&D chain, with an eye toward moving local industry from imitation to innovation.

⁷ See Saggi (2002 and 2016) for extensive surveys of the economics literature exploring the inter-linkages between trade, FDI, and international technology transfer.

The Ginarte-Park (GP) index is a convenient means of examining the evolution of patent protection in Asia during recent decades. This index synthesizes five separate categories pertaining to a country's patent protection: coverage, membership in international treaties such as TRIPS, duration of protection, enforcement mechanisms, and restrictions (such as compulsory licensing) that limit a patent-holder's control over its invention. The index yields a score ranging from 0 to 5, with a higher value indicating stronger patent protection implemented by a country.

Table 5 shows the GP index for six major Asian countries during 1990-2010. The table also includes the US as a benchmark since it is considered as one of the countries that enforce the most stringent IP protection. Back in 1990, the GP scores of Asian developing countries such as China and India were much lower than those of developed countries such as Japan, let alone the US whose score was close to the highest possible level. However, by 2010 the GP scores of Asian developing countries had increased substantially. For example, the GP scores of China and India rose from 1.33 and 1.03 in 1990 to 4.21 and 3.76 in 2010 respectively, indicating a narrowing of the degree of patent protection between major Asian countries and the US.

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As with trade, Asia has become considerably more active in patenting and in 2014 it accounted for roughly 60% of global patent applications, a number that coincides almost exactly with its share of the global population. During 1997-2014, Europe's share of global patent applications declined from 22.8% to 12.9%. By contrast, the US managed to maintain its footing and its share of global patent applications even increased slightly from 19% to 21.6%.

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Within Asia, the stand-out performer has been once again China, where patenting activity has literally surged in recent decades. Back in 1997, China was the third largest recipient of patent applications in Asia and it accounted for only 4.3% of Asian patent applications. However, by 2014, China's share had risen to a remarkable level of 57.7% and more patent applications were filed in China than in any other Asian country. In contrast, Japan's share in Asian patent applications fell from an impressive 70.5% in 1997 to just 20.3% in 2014. Of course, as Geng and Saggi (2015) note, one should interpret these numbers with some caution. Count data on patent applications (and even grants) tell us virtually nothing about the economic values or the qualities of the underlying technologies. Indeed, Chinese leadership has explicitly recognized that while number of patent applications in China has

increased sharply in recent decades, the quality of local patent applications remains relatively low.⁸

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Patent applications can be filed by local or foreign inventors. To better capture the scale of indigenous innovation, it is useful to differentiate between resident and non-resident patent applications. All else equal, a larger share of resident applications indicates relatively more indigenous innovation. Table 7 presents the relevant data. Notably, the share of residents in patent applications filed in China increased considerably from 51.2% in 1997 to 79% in 2014. On the other hand, the share of residents in patent applications filed at the US Patent Office (USPTO) slightly decreased.

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While patent applications and grants measure the output side of the innovation process, it is also useful to examine the input side. To measure a country's emphasis on innovation, we define a country's R&D intensity as the ratio between its R&D expenditure and GDP. Many Asian countries have stepped up their R&D investment and, in recent years, the R&D intensities of Japan and South Korea have even exceeded that of the US. Among major Asian countries, China exhibited the fastest growth rate of R&D intensity over 1997-2011. In fact, its R&D intensity tripled over 1997-2011, up from 0.6% in 1997 to 1.8% in 2011. Since the Chinese economy has grown remarkably fast, behind the observed increase in R&D intensity lies an impressively large increase in the absolute level of R&D investment. The level of R&D intensity for China, however, remains considerably lower than developed countries such as Japan and South Korea.⁹

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⁸ The first objective stated in the Chinese *Promotion Plan for the Implementation of the National Intellectual Property Strategy* is to "improve IP appraisal and assessment system... and to shift the focus on IP quantity to IP quality, and boost IP value." Of course, the concern with patent quality is hardly unique to China: examples abound of trivial inventions that have been granted patents even in the United States. See Maskus (2012) for some examples of patents granted by the USPTO that have attracted widespread criticism.

⁹ In 2011, the absolute level of R&D investment in China was roughly half that of the United States and about 62% of that of Japan. By contrast, Chinese R&D investment in 1997 was only 3% of that of the US and 5% of that of Japan. This is a remarkable surge in R&D activity in China over a fairly short time horizon.

3. The US-Asia Economic Relationship

3.1. Trade between US and Asia

Despite Asia's increasing presence in world trade, its relative importance as a trading partner of the US did not change significantly over the last twenty five years or so. Though the absolute level of trade between Asia and the US increased substantially (at an average annual growth rate of roughly 6.6%), Asia's share in US foreign trade has been relatively steady at around 36%. These trends suggest that Asian economies have been increasingly successful at cultivating new markets for their exports in rest of the world.

The percentage of US imports sourced from Asia has tended to hover around 41% and the percentage of US exports destined for Asia around 30%. Thus, from the American perspective, the *relative* importance of Asia over the time period under study has not changed significantly.

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Within Asia, the distribution of the US-Asia trade has changed in a rather subtle manner. On the one hand, the top trading partners of the US in Asia have remained fairly consistent over time.¹⁰ On the other hand, the trade shares of individual nations did change significantly. While Japan was the largest Asian trading partner of the US during 1990-94, it was replaced by China over 2010-14. More notably, China's share of Asian exports to the US shot up from 10.9% over 1990-94 to 45.1% over 2010-14 while that of Japan fell by almost the same magnitude (from 42.3% to 14.4%).

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As for Asian imports from the US, there was only one change to the top five destinations of the US's exports to Asia: China went from not being on the list in 1990-94 to becoming the largest Asian importer of US goods over 2010-14. In some ways, China's rise as a major Asian importer of American products is even more striking than its emergence as the leading Asian exporter to the US. Specifically, China's share in Asia's imports from the US increased rather dramatically from 5.3% over 1990-94 to almost 25% over 2010-14.

¹⁰ Four of the top five Asian exporters to the US over 1990-1994 remained on the list over 2010-14. The only exception is Singapore which was replaced by Saudi Arabia over 2010-14.

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It is worth noting that, from the Asian perspective, the relative importance of the US market has somewhat declined over time: the US's share in Asian imports from the rest of the world fell from 14.3% in 1995 to just 6.7% in 2014 while the percentage of Asian exports sold in the US also declined from 22.9% to 13.2%. These figures suggest that, from a trade perspective, Asia is becoming increasingly less reliant on the US market.

3.2. Bilateral FDI between the US and Asia

Contrary to what one might expect, Asia's share in the US's outward FDI flows has actually fallen over time: over 1990-94, Asia absorbed roughly 14% of US FDI flows whereas over 2010-14 its share was roughly 10%. Similarly, Asian countries do not account for a significant proportion of the US stock of outward FDI. Asia's share in the US's outward FDI stocks only increased slightly from 11.7% in 1990 to 12.7% in 2014. The bulk of the US FDI stock (i.e. over 50%) continues to lie in Europe.

How have individual Asian countries fared in terms of attracting FDI from the US? Two countries that lie on the opposite spectrum of the size scale seem to have fared particularly well: China and Singapore. China's share of US FDI flows increased from 5.4% over 1990-1994 to 10.7% over 2010-14. Even more notable is the fact that China's share of the US outward FDI stock increased from a miniscule 0.7% in 1990 to a healthy 11.0% in 2014. Singapore's experience seems even more remarkable, especially given its small size: over 2010-14 Singapore absorbed more than half of total US FDI into Asia. As a consequence, Singapore's share of the US FDI stock in Asia stood at an impressive 33.9% in 2014. By contrast, Japan accounted for only 16% of US outward FDI stock in Asia.

As for FDI flows to the US, Asia continues to play second fiddle to Europe: while Asia accounted for 22% of FDI inflows into the US over 2010-14, Europe's share stood at 61%. Among Asian countries, Japan continues to be the largest source of FDI into the US although its relative importance has declined over time: while Japan accounted for almost 90% of Asian FDI flows into the US during 1990-94, its share had declined to 66% by 2010-14.

Data on the stocks of FDI in the US tell a fairly similar story to the one told by flow data: over two-thirds of the FDI stock in the US is owned by Europe and Japan continues to be the largest Asian investor, dwarfing other major Asian countries -- for example, during

2010-14, Japan accounted for 76% of the inward FDI stock in the US whereas South Korea accounted for 8% and China only 2%.

On the policy front, there has not been much action in the domain of FDI. Currently, the US has bilateral investment treaties (BITs) with about 42 countries, only 7 of which are from Asia. Furthermore, all of the partner countries from Asia are small. But this may not matter a whole lot since the US does not have any BITs with major European nations either. The lack of such treaties might simply reflect the fact that the business and policy environment in major European nations as well as the richer Asian countries is already friendly to foreign investors so that there is little need for an investment treaty.

3.3. Innovation and patenting links between Asia and the US

In recent years, Asia has become an increasingly important location for the overseas R&D activities of US multinational firms. Asia's share of the R&D expenditure of affiliates of US multinationals increased from 11.6% in 1997 to 24.1% in 2013. At an absolute level, this translated into an R&D expenditure of almost \$12 billion in 2013.

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In recent years, Asian countries have typically accounted for more than half the patent applications filed at the USPTO. The share of Asian countries in total foreign patent applications filed at USPTO was already 53.9% over 1990-1994. Over time, this share has increased steadily and it stood at 61.3% over 2010-14. Furthermore, Asia patent applications at the USPTO have become less concentrated over time. During 1990-94, almost 87% of Asian patent applications at the USPTO originated in Japan. But by 2010-14, Japan's share had fallen substantially and it accounted for just over 51% of Asian patent applications at the USPTO. In the meantime, countries such as China, India, South Korea and Taiwan have all seen their shares increase. For example, China's share shot up from a paltry 0.3% during 1990-94 to a respectable 7.8% over 2010-14.

The data on patents granted by the USPTO tells a very similar story to that on patent applications: during 1990-94 about 52.6% of patents granted to foreigners went to Asia and this share rose to 63.8% over 2010-14.

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In a recent paper, Branstetter et al. (2015) examine data on patents issued by the US to foreign residents and find that a majority of patents granted to Chinese (and Indian nationals) have been to researchers working for subsidiaries of multinational corporations. They argue that the general rise of international co-invention reflects an expanded international division of labor within global R&D networks, much like the slicing of the global production chain across the world. The authors also compare the quality of patents (as measured by citations) granted to Chinese or Indian indigenous inventions with those granted to (a) co-inventions with inputs from advanced economies and to (b) co-inventions with inputs from advanced economies under the sponsorship of multinational firms. They find that co-invented patents tend to be of higher quality, as do patents developed under the sponsorship of multinationals. These findings suggest that Asia will likely become an increasingly important technological partner of the US and this development will be of substantial mutual benefit to both sides.

4. Trade Policy: Cooperation and Frictions between Asia and the US

4.1. Tariffs

US MFN tariffs have been fairly low for quite some time. The average MFN tariff (weighted by import volumes) of the US in 1997 was 3.8% and it was further reduced to 2.5% in 2014. In line with global trends, MFN tariffs in Asian countries have also been declining. Almost all major Asian countries implemented lower MFN applied tariffs in 2014 as compared to 1997. Nevertheless, the extent to which the MFN tariffs fell varied across countries due to the fact that countries like Japan and Singapore already had fairly low tariffs in 1997. On the other hand, South Korean tariffs remain fairly high and even exceed those of India. Perhaps this was one major motivation behind the recently concluded free trade agreement between the US and South Korea.

--- Table 10 here ---

While MFN tariffs are applied on a non-discriminatory manner, antidumping duties tend to be targeted at finely defined products from specific countries. How has Asia fared in terms of being a target of antidumping investigations in the US? We turn to this next.

4.2. Antidumping duties

Economists generally consider antidumping (AD) duties to be worse than MFN tariffs since they tend to be discriminatory in nature, usually targeting the most efficient sources of

foreign supply.¹¹ For decades, the US was one of the leading users of AD duties and the extent to which Asian countries have turned to AD duties as a means of trade protection is rather worrisome.

The good news is that the number of AD cases filed in the US fell from 292 in 1990-94 to 88 over 2010-14, a decrease of almost 70%. Even though the number of AD cases filed against Asia also declined over time, Asia's share increased from 42.5% over 1990-94 to 76.1% over 2010-14. As one might expect, China has consistently been targeted more than other Asian countries, with Japan and South Korea being the other two major targets. One way to evaluate these numbers is to compare the incidence of AD with the value of bilateral trade. After all, firms in the US are more likely to initiate AD cases against countries from whom the US imports more. Indeed, a surge in imports from a specific source typically precedes the initiation of an AD case.

Figure 11 plots the absolute value of US imports from Asia against the number of AD cases filed against Asia. The story told by this figure does not seem to indicate a worsening of trade relations: while US imports from Asia surged during 1990-2014, the number of AD cases filed against Asia relatively flat, hovering around 20 cases per year.

--- Figure 11 here ---

Additional perspective on AD activity in the US is provided by Figure 12 which compares the share of US AD cases against Asia with the share of US imports sourced from Asia. As is clear, while Asia has continued to supply roughly 40% of US imports through-out the sample period, its share in US AD cases seems to have actually increased. Thus, the overall picture is that while the total number of AD cases in the US have fallen over time, in recent years a relatively greater proportion of these cases have tended to target Asian exporters.

--- Figure 12 here ---

¹¹ In addition, even in countries with low MFN tariffs (such as the US), the magnitude of AD duties tends to be quite large.

4.3. Trade Policy Cooperation

The US is currently party to 20 free trade agreements (FTAs), six of which are with Asian countries. Except for Israel, all agreements with Asian countries were signed after 2000. Perhaps the most important recent FTA is the one with South Korea, a country that is fast moving up the technological ladder but still retains surprisingly high import tariffs. Gaining access to the South Korean market at preferential tariff rates could be attractive to the US precisely because its MFN tariffs are relatively high.

The much-discussed Trans-Pacific Partnership was meant to be a far-reaching agreement between the US and 11 Pacific Rim countries cutting across a wide range of issues pertaining to market access, intellectual property, services, investment, as well as environmental and labor standards. It was historic in its ambition and scale with the combined GDP of participating countries exceeding \$28 trillion (more than one third of world GDP). The recent Presidential elections in the US appear to have ended any real hope of the TPP coming to fruition in the near future.

During the US Presidential election, both Hillary Clinton and Donald Trump expressed opposition to the proposed deal as did the senate majority leader Mitch McConnell when he refused to even take up the ratification of the TPP in the US congress. The fatal blow to the TPP was struck by President Trump on January 23, 2017 when he signed an executive order officially pulling the US out of the TPP. Twelve years of negotiations appeared to have come to nothing and what could have been a signature achievement of Obama's proposed policy pivot toward the Pacific Rim essentially evaporated into thin air.

It is possible that the framework developed by the TPP and the negotiations conducted during the last years may eventually end up providing a basis for a future trade deal between the Asia and the US but that is essentially a speculation at this point, particularly when one considers the pressure that President Trump has put on American firms to reduce international outsourcing and production shifting. It is possible that TPP negotiations continue in the absence of the US although it is hard to imagine that the countries that remain on the table will want to pursue the TPP in its current form. Once US interests are excluded from the TPP, the nature of the agreement that is optimal from the perspective of participating countries is likely to be quite different from the one that had been negotiated under US leadership, particularly in the areas of intellectual property, the environment, and labor standards. If an alternative trade deal between the other eleven countries emerges and is very different in character from the TPP, the US may find itself in a rather regrettable position having abandoned an agreement that it helped shape for almost a decade.

4.4. Trade Disputes at the WTO

Bilateral trade frictions between nations sometimes surface in the form of trade disputes at the World Trade Organization (WTO). Typically, the dispute settlement process of the WTO comes into play when a pair of countries fail to resolve their disagreement over a policy measure instituted by one of them that is seen as being harmful by the other country. Due to the wide scope of activities that fall under the purview of the various WTO agreements, such bilateral disputes arise over a wide variety of policy measures ranging from quantitative restrictions on trade, technical barriers to trade based on product and health standards, as well as violations of intellectual property.

During 2007-11 more than half the trade disputed initiated by the US at the WTO were against Asian countries while the US was the defendant in about 30% of the disputes initiated by Asian countries. One way to evaluate these numbers is to compare the incidence of disputes between the US and Asia with the value of their bilateral trade. After all, if a pair of countries do not trade much with each other country, there is little opportunity or reason for them to get tangled in a dispute. The incidence of trade disputes between the US and Asian countries do seem a bit high (but not significantly so) when evaluated in the context of the degree of bilateral trade between them: Asia accounted for about 41% of US imports but was the target of US complaints in about 56% of the cases. When viewed from the US perspective, Asian dispute activity appears to be even more skewed: while the US accounted for under 11% of Asian imports in 2007-11, it was the defendant in almost 30% of dispute cases. This might reflect a tit-for-tat strategy on the part of some Asian countries who may have responded to US complaints by filing trade complaints of their own against the US.

---Table 12 here ---

4.5. Policy Frictions over Intellectual Property Issues

Prior to the ratification of TRIPS, frictions between the USA and China and USA and India over violations of intellectual property were fairly common. For example, both countries were frequently listed in the Super 301 annual list of trading partners that were deemed in the eyes of the US government to have engaged in unfair trading practices. Does the changing global landscape of innovation imply that international frictions over the enforcement of intellectual property rights are a thing of the past? This is almost surely not the case, although the nature of underlying problems seems to have evolved.

Throughout the 1980s and early 1990s, USA-China frictions over IPRs had to do with the widespread imitation of US products and technologies by Chinese firms, as well as the

infringement of copyrights. While these issues have not entirely gone away, several new ones have emerged in recent years. For example, one of the major complaints that the US government has expressed about China has to do with its policy of forcing foreign firms to share their technologies with local partners as a precondition for doing business in China. This policy began in 1994 when China started to impose specific technology transfer requirements on foreign firms wishing to enter its local market. In 2009, the Chinese Ministry of Science and Technology China upped the ante when it officially promulgated its “indigenous innovation policy,” under which it provided conditions that would determine whether or not new products in six major industries could be viewed as having been the result of indigenous innovation. Only products that were deemed to be indigenous would be included in the catalog of approved government procurement lists, thereby setting up conditions for potential preferential treatment of indigenous innovation.

As Maskus (2012) explains, this focus on indigenous innovation can easily run afoul of the national treatment obligation of TRIPS and raises substantial concern among foreign enterprises owning IPRs. In response to these concerns and other external pressures, China circulated a revised and weaker draft of the indigenous innovation policy in 2010. At this time, there is considerable uncertainty regarding the true nature and actual implementation of this policy. Rest assured, if discrimination against foreign innovators becomes widespread or systemic, one would expect the dispute settlement process of the WTO to play an active role in refereeing and clarifying this Chinese policy.

The TRIPS sanctioned policy of compulsory licensing of patents is another area in which disputes between the US and Asia might arise. For example, in 2012, frictions between India and the pharmaceutical multinational Bayer flared up when India issued a compulsory license for Bayer’s cancer drug Nexavar. This episode raised the possibility that India could try to use its substantial manufacturing capacity in the area of pharmaceuticals to break patents held by foreign firms, thereby weakening its IPR regime while still maintaining TRIPS compliance. However, since then, India has not issued any further compulsory licenses; in fact, India’s Department of Industrial Policy and Promotion recently rejected a request for compulsory licensing because the Indian generic producer (BDR Pharmaceutical) seeking the compulsory license had failed to try to obtain a voluntary license from the patent-holder (Bristol-Myers Squibb), as is required under TRIPS rules.

5. Conclusion

In this paper we have studied the evolution of US-Asia bilateral economic relationship over the last twenty five years or so and evaluated it in the context of overall Asian engagement with the world economy. During this period, not only has the collective economic clout of Asian countries grown considerably, economic power has been reallocated substantially

within the region: China has gained in prominence relative to Japan while South Korea has held steady.

Asian exports (of goods) to the rest of the world have grown much faster than those of the US and in 2014 Asian exports were roughly four times that of the US. China's share of Asian exports surged from 6% in 1990-94 to 28% in 2010-14 while that of Japan declined from 31.4% to 10.5%. While bilateral trade between the Asia and the US grew at an average annual growth rate of roughly 6.6%, Asia's share in US foreign trade has been relatively steady at around 36%. One possible interpretation of this fact is that the *relative* importance of Asia to the US over the time period under study has not changed significantly. From the Asian perspective, the importance of the US market may actually have declined over time: the US's share in Asian imports fell from 14.3% in 1995 to 6.7% in 2014 while the percentage of Asian exports sold in the US also declined from 22.9% to 13.2%. These figures indicate that Asia maybe becoming less reliant on the US market. If so, the question becomes whether the US should undertake proactive trade policy measures that help counteract this trend.

FDI data do not tell a markedly different story from the one told by trade data. While FDI flows between Asia and the US have grown over time, much of the stock of US owned FDI abroad is still in Europe. Similarly, the ownership of the bulk of the FDI stock in the US continues to lie in European hands.

It is in the sphere of innovation and patenting where things are moving the fastest and the pace of change might even increase further in coming years. Asian countries now account for a majority of the patent applications filed by foreign residents at the USPTO. China, India, and South Korea have amped up their investments in R&D significantly. Sooner or later, these investments are going to translate into higher rates of innovation and patenting. Rather than view this with alarm, the US ought to welcome these developments. The creation of new knowledge and technologies is not a zero-sum game. While inventors draw temporary economic rents from their inventions (provided their intellectual property is protected), their creations contribute to the global knowledge pool and raise long run standards of living in the world while also contributing to future innovation.

Indeed, prior to the ratification of TRIPS, a longstanding US complaint was that imitation of technologies created by their technologies in the rest of the world (especially Asia) had created a situation where many countries were free-riding on investments made by its firms and citizens. The rise of Asian innovation will likely create new opportunities for increased US-Asia cooperation in the realm of intellectual property, an area characterized by significant policy frictions between the two regions in the pre-TRIPS era. Indeed, as noted in the paper, a promising trend in this regard is the increase in US patents granted to co-inventions resulting from collaboration between US and Asian researchers.

Where might be American trade policy headed in the near future? A lot rides on this question but the answer is far from clear. Through-out the post war period, the US has been seen as a champion of global free trade; it imposed low tariffs on others and pushed for the same in other parts of the world. The US has not signed very many trade agreements with major Asian countries and is frequently involved in trade skirmishes with them in the realms of antidumping and trade disputes at the WTO. Within a few days of taking office, President Trump officially ended US involvement in the TPP thereby ending any hope that the protracted TPP negotiations would end up delivering a historic and far-reaching trade agreement between the US and eleven other Pacific Rim countries. Whether the negotiations underlying the TPP can serve as building block for future trade policy initiatives between the US and Asia is an open question at this point. All in all, the nature of the current political climate in the US does not support overly optimistic expectations on this front.

Table 1: Per capita income relative to the US (US = 100)

	1990	1995	2005	2014
China	1.4	2.2	4.0	8.5
India	1.2	1.3	1.6	2.7
Indonesia	2.7	3.4	3.1	4.3
Japan	97.6	95.1	82.0	82.6
South Korea	26.3	35.0	43.0	54.2
Asia	6.8	6.9	7.0	9.1
US per capita GDP (\$)	32285	34888	43924	45664

Source: UNCTAD

Table 2: Global allocation of merchandise exports

	1990-94	1995-99	2005-10	2010-14
Asia	28.7%	29.6%	35.4%	40.0%
Europe	47.4%	46.0%	43.1%	38.4%
US	11.9%	12.0%	8.3%	8.3%
World total (current \$, tn)	1.9	2.7	6.5	9.0

Source: UNCTAD

Table 3: Top five Asian exporters

1990-94	Share	2010-14	Share
Japan	31.4%	China	28.0%
Hong Kong	10.8%	Japan	10.5%
China	8.0%	South Korea	7.5%
Taiwan	7.5%	Hong Kong	6.7%
South Korea	7.2%	Singapore	5.5%

Source: UNCTAD

Table 4: Top five Asian importers

1990-1994	Share	2010-2014	Share
Japan	24.2%	China	26.5%
Hong Kong	12.3%	Japan	12.2%
South Korea	8.3%	Hong Kong	8.2%
China	8.2%	South Korea	7.5%
Singapore	7.7%	India	6.7%

Source: UNCTAD

Table 5: Ginarte Park index: 1990-2010

	1990	2010
China	1.33	4.21
India	1.03	3.76
Japan	3.88	4.67
Malaysia	2.05	3.68
Singapore	2.04	4.21
South Korea	3.69	4.33
USA	4.68	4.88

Source: Email from Walter Park.

Table 6: Global patent applications

	1997	2000	2010	2014
Asia	49.1%	46.2%	51.1%	60.0%
Europe	22.7%	23.3%	17.3%	12.9%
US	19.0%	21.5%	24.7%	21.6%
World total (millions)	1.1	1.4	2.0	2.7

Source: WIPO Statistic Database

Table 7: Share of residents in patent applications

	1997	2014
China	51.2%	79.0%
India	19.0%	20.9%
Japan	87.0%	83.9%
South Korea	72.7%	77.1%
US	54.1%	49.3%

Source: WIPO Statistic Database

Table 8: Share of R&D performed by foreign affiliates of US multinationals

	1997	2005	2010	2013
Asia	11.6%	17.9%	24.0%	24.1%
Canada	12.5%	8.8%	6.9%	6.5%
Europe	68.5%	68.0%	59.9%	61.2%
R&D (current \$, bn)	14.6	27.7	40.0	48.8

Source: US Bureau of Economic Analysis

Table 9: Patent grants at the USPTO: shares of Asian countries

	1990-94	1995-99	2005-09	2010-14
China	0.2%	0.2%	1.9%	5.6%
India	0.1%	0.2%	1.1%	2.2%
Japan	90.9%	81.9%	67.6%	58.8%
Singapore	0.1%	0.3%	0.8%	0.9%
South Korea	2.5%	7.2%	13.1%	16.2%
Taiwan	4.5%	7.8%	12.2%	11.9%
No. of grants to Asia	107,152	129,940	169,684	247,396

Source: USPTO

Table 10: Tariffs of major Asian importers from the US

	All items		Dutiable items	
	1997	2014	1997	2014
China	15.9%	4.6%	16.2%	8.5%
Japan	3.8%	1.9%	5.6%	7.6%
South Korea	15.3%	10.0%	15.7%	13.8%
Taiwan	4.4%	1.7%	5.6%	6.4%
Hong Kong	0	0	0	0
Singapore	6.5%	0	10.9%	0
India	23.5%	6.8%	30.5%	10.3%

Source: World Trade Organization

Table 11: US FTAs and trade shares (Asian countries in bold font)

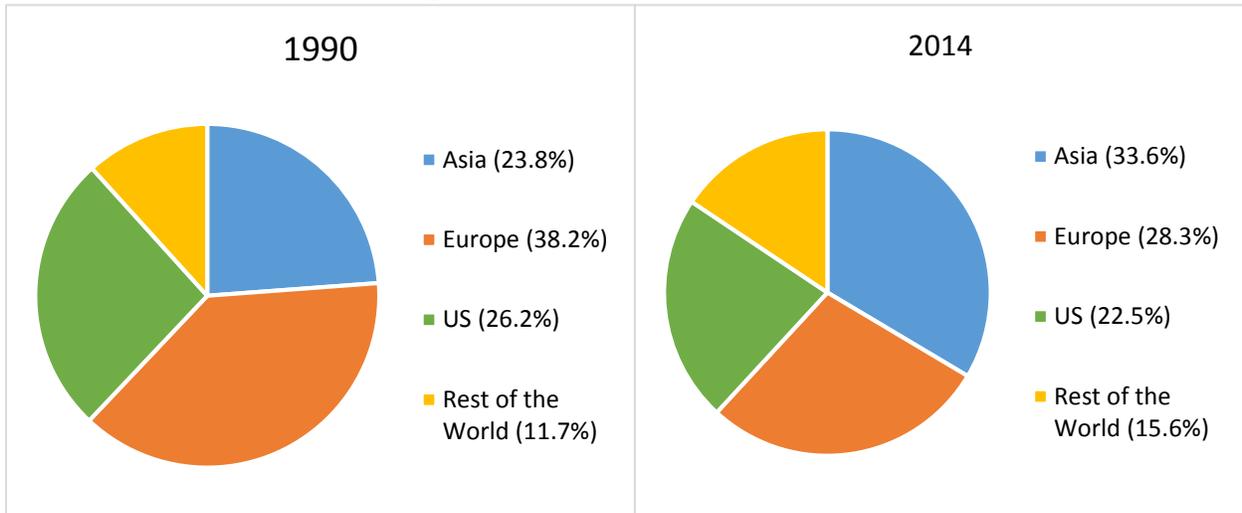
	Enforcement year	Share in US trade (2000-14)
Australia	2005	1.0%
Bahrain	2006	0.0%
Canada	1994	17.8%
Chile	2004	0.6%
Colombia	2012	0.8%
Costa Rica	2009	0.4%
Dominica	2007	0.3%
El Salvador	2006	0.2%
Guatemala	2006	0.3%
Honduras	2006	0.3%
Israel	1985	1.0%
Jordan	2010	0.1%
Mexico	1994	12.2%
Morocco	2006	0.1%
Nicaragua	2006	0.1%
Oman	2009	0.1%
Panama	2012	0.2%
Peru	2009	0.3%
Singapore	2004	1.4%
South Korea	2012	2.8%

Table 12: WTO disputes and trade

	1995-98	1999-2002	2003-06	2007-11
Asia's share in US trade	36.9%	34.8%	35.6%	36.1%
Asia's share in US-filed disputes	27.5%	17.8%	22.2%	55.8%
Total No. of US-filed disputes	80	45	36	43
US share in Asia's Trade	17.4%	17.8%	13.7%	10.6%
US share in Asia-filed disputes	28.0%	55.9%	32.1%	29.3%
Total No. of Asia-filed disputes	50	68	53	58

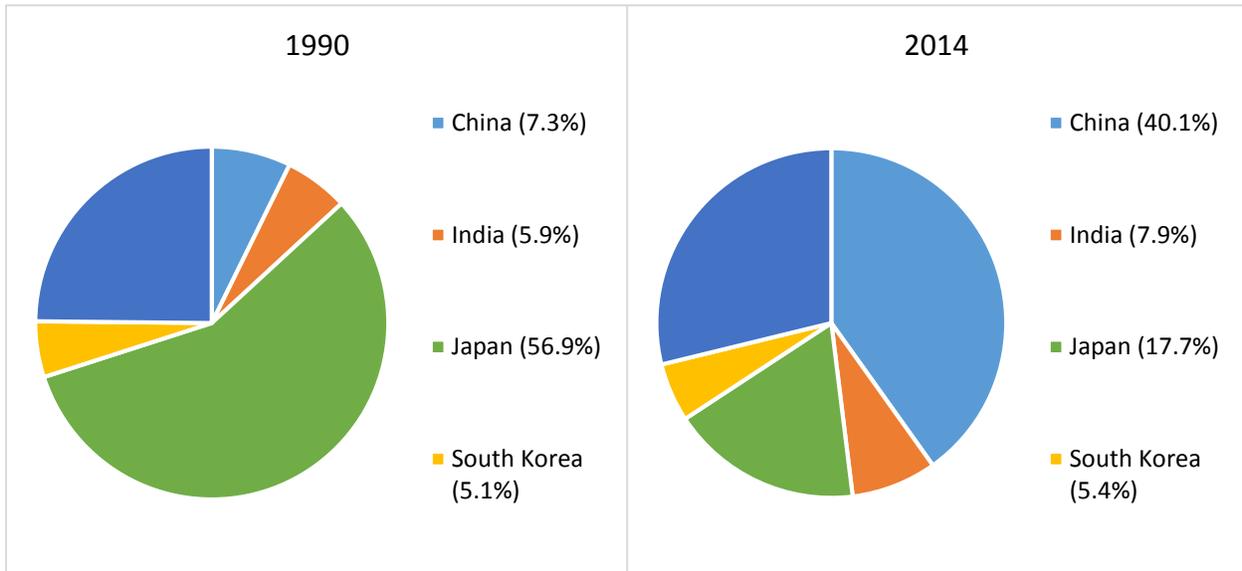
Source: WTO database and the BEA

Figure 1: Global allocation of GDP



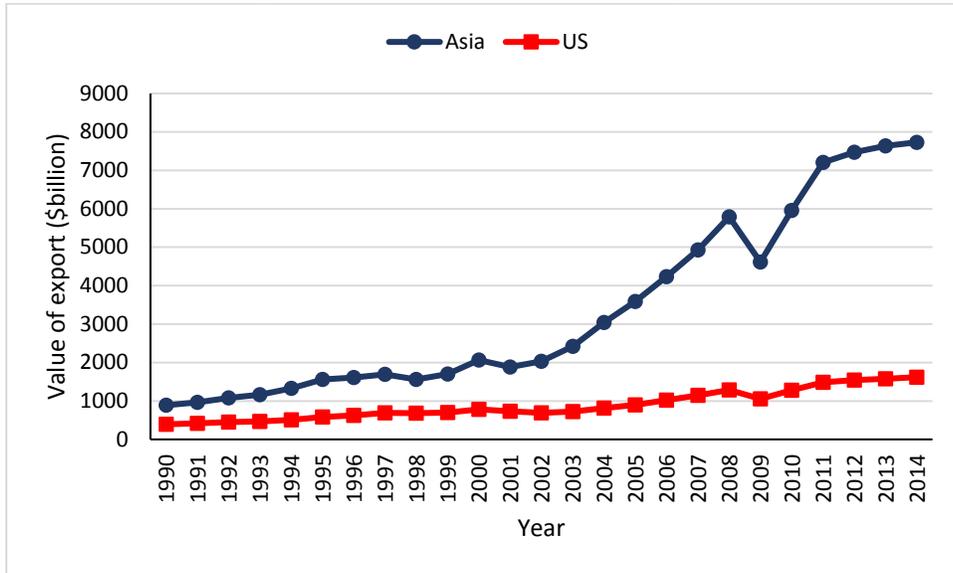
Source: UNCTAD

Figure 2: Allocation of GDP within Asia



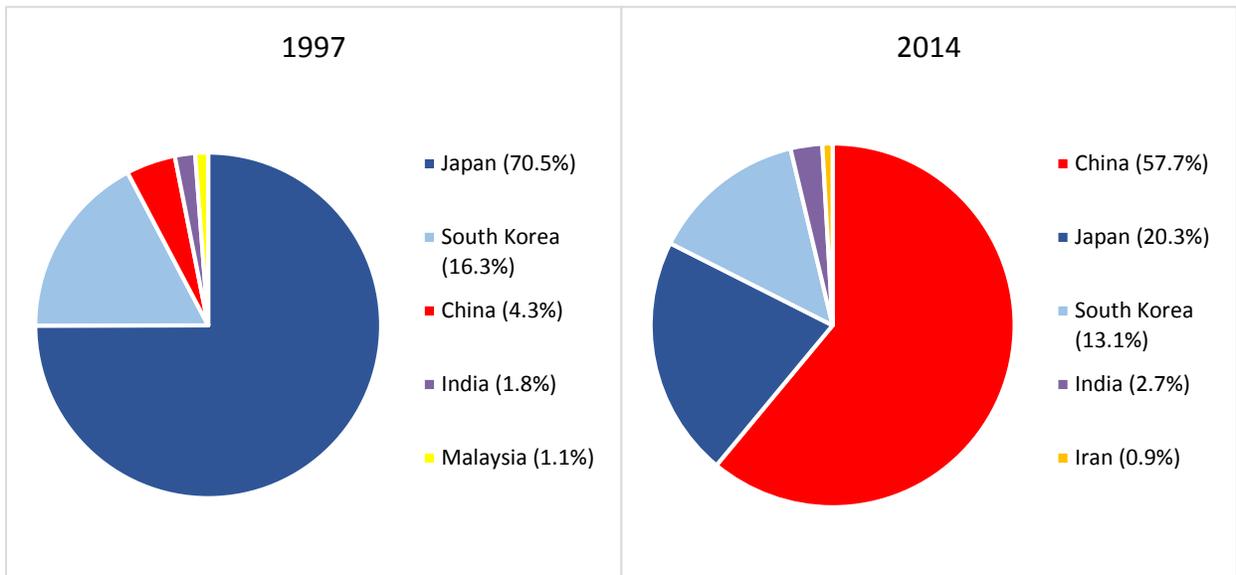
Source: UNCTAD

Figure 3: Value of merchandise exports



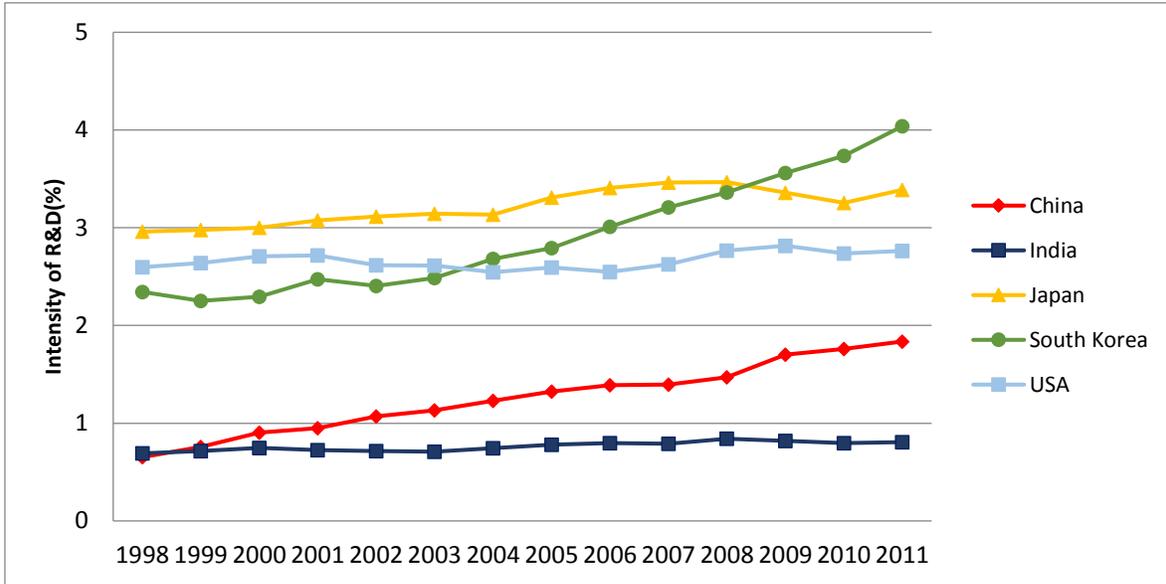
Source: UNCTAD

Figure 4: Top five Asian recipients of patent applications



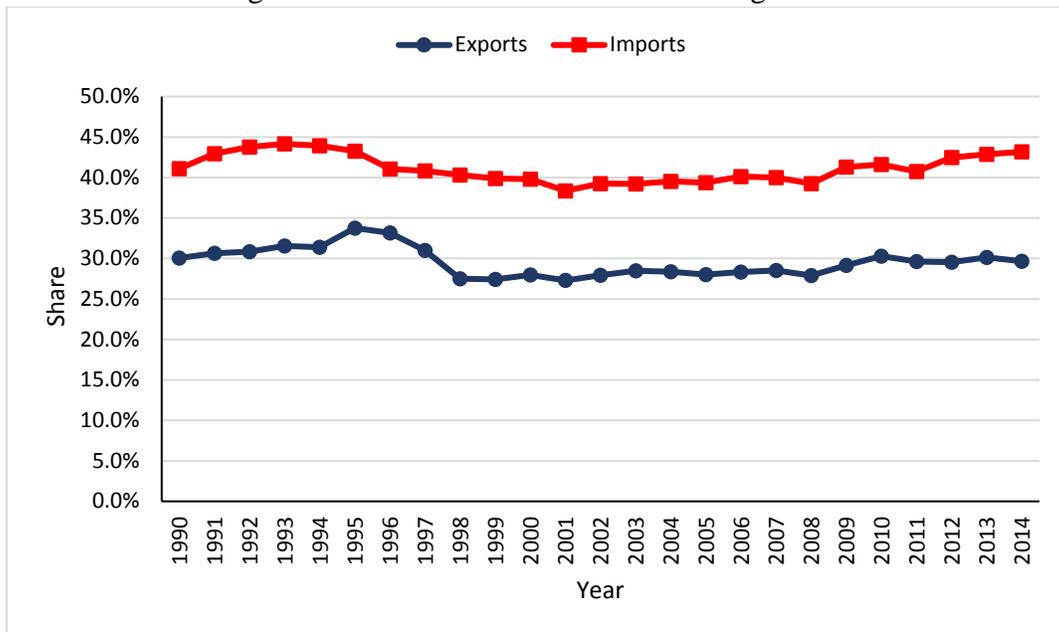
Source: WIPO Statistics Database

Figure 5: National R&D intensities



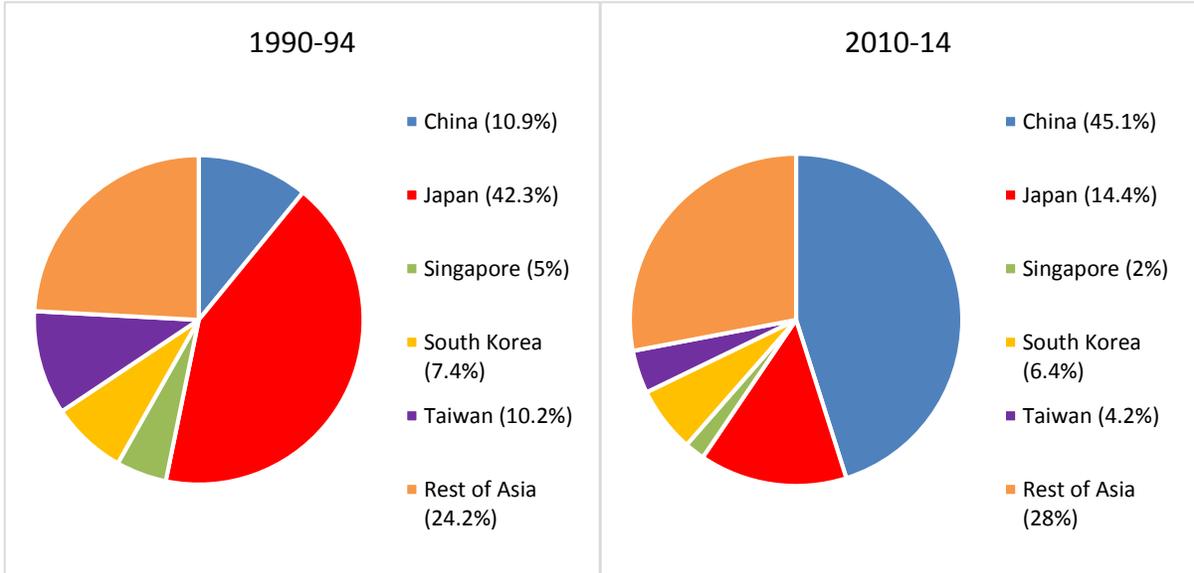
Source: World Development Indicators

Figure 6: Shares of Asia in the US's foreign trade



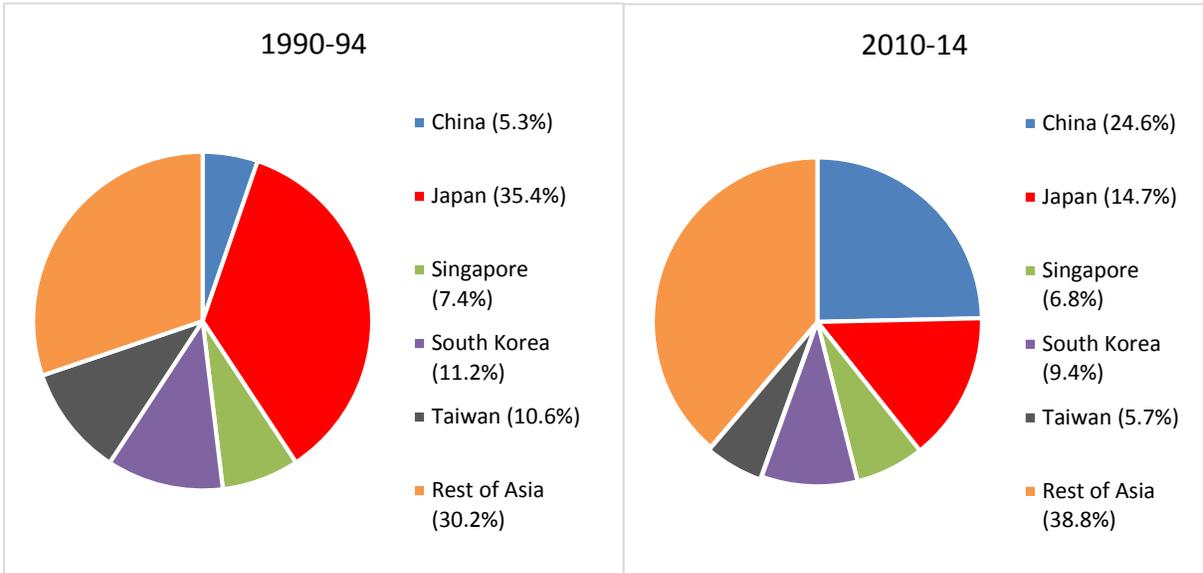
Source: US Census Bureau

Figure 7: Major Asian exporters to the US



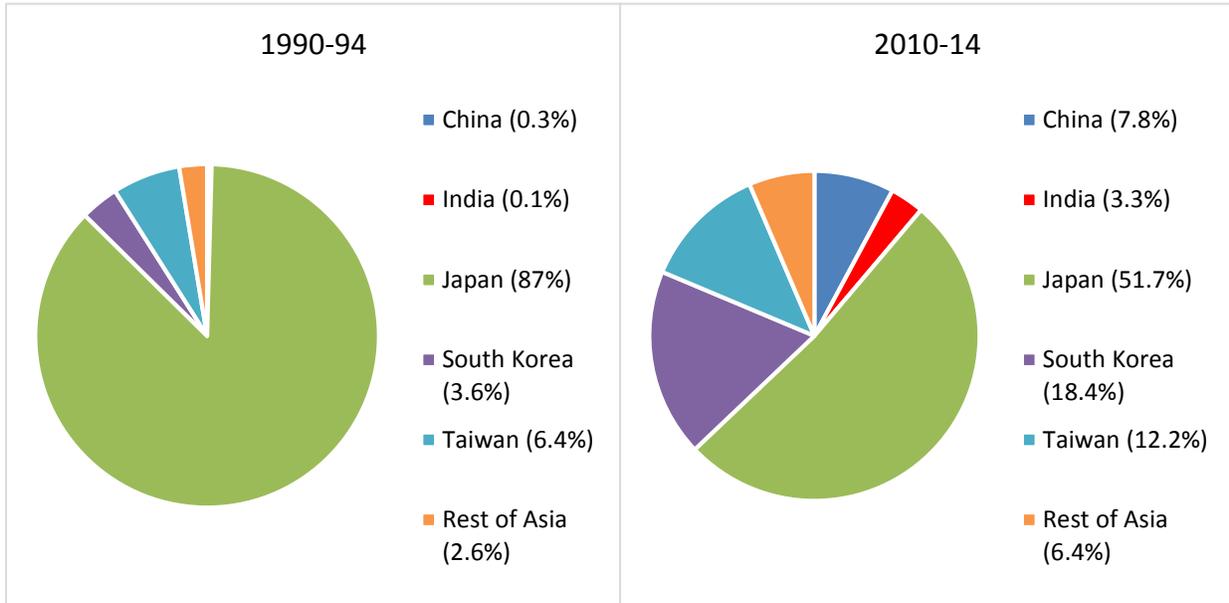
Source: US Census Bureau

Figure 8: Major Asian importers from the US



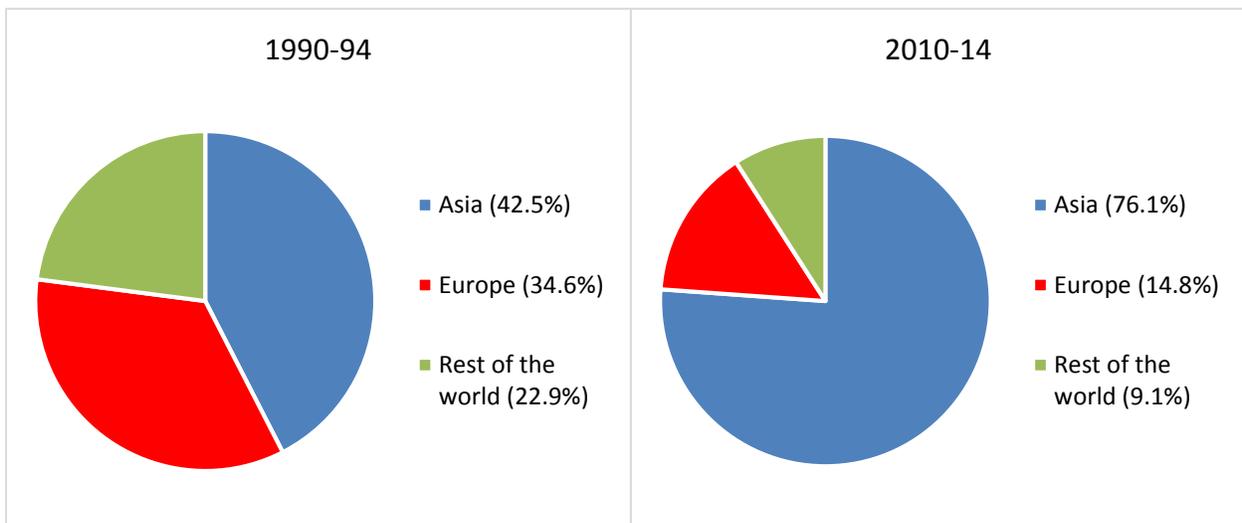
Source: US Census Bureau

Figure 9: Patent applications as shares of Asian countries at USPTO



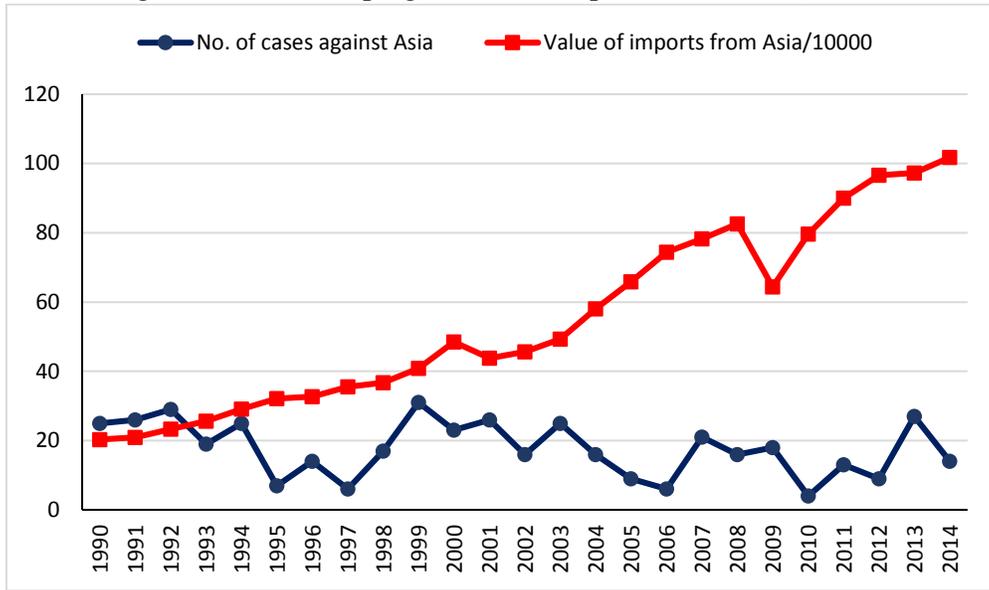
Source: USPTO

Figure 10: Shares of antidumping cases filed by the US



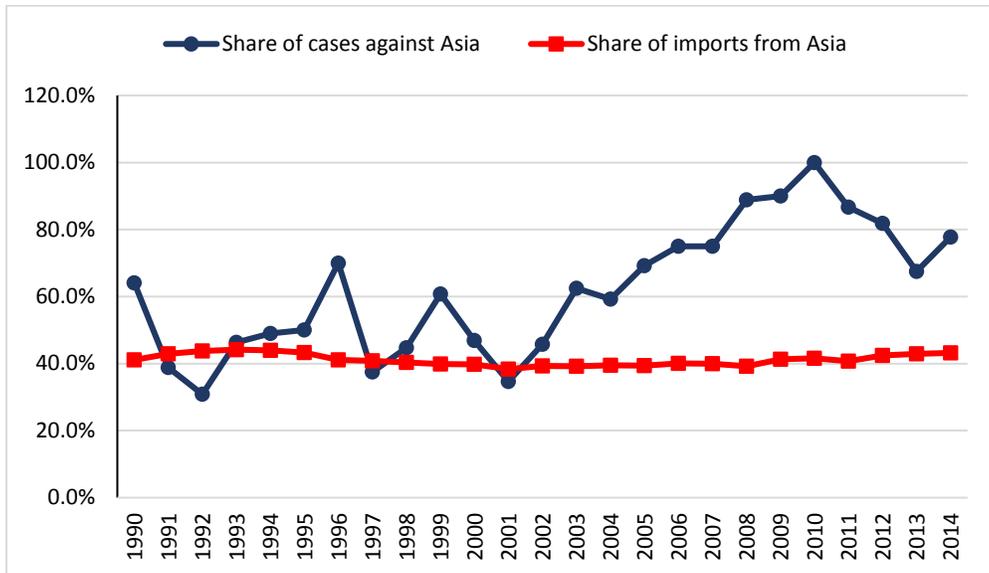
Source: Global Antidumping Database

Figure 11: Antidumping cases and imports from Asia (levels)



Source: Global Antidumping Database and US Census Bureau

Figure 12: Antidumping cases and value of imports from Asia (shares)



Source: Global Antidumping Database and US Census Bureau

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