A Tale of Two Political Economies: better understanding the international dynamics of China's "rise" in a world of increasingly globalized production through advances in trade data

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Note: This paper has 16 figures, which are appended at the end of the text

Introduction

Few economic questions are as foundational to the human condition as who makes what, where, how, and in cooperation with whom. In the past, world trade was often comprised of goods made entirely in one country that crossed national borders only if necessary to reach consumers in a second country. In recent decades, however, the globalization of manufacturing has increased rapidly as trade and investment barriers, communications costs, and transportation prices have declined. From smartphones and automobiles, to clothing and home appliances, multinational corporations have reorganized the production of many goods into complex global value chains (GVCs) in which economic activities are "sliced" into increasingly fine tasks reflecting highly specialized core competencies within research and development, marketing, basic fabrication and assembly, distribution, and post-sales service.

In many cases, these tasks are completed across numerous countries, with "goods in process" repeatedly traversing territorial borders. As a result, a new international division of labor has arisen – e.g., the multi-country production of Apple's iPhone – in which identifying what various countries "do" within GVCs is arguably more important than simply documenting which country ultimately exports the finished good to consuming countries. In a 2010 report, the World Bank declared that "GVCs have become the world economy's backbone and central nervous system," a position echoed widely in the academic literature.[1] If GVCs are, in fact, "the core feature of the international political economy,"[2] as one scholarly article recently concluded, then our understanding of broader dynamics between countries must be informed, at least in part, by empirical analysis of their participation in GVCs. Unfortunately, conventional trade statistics, namely data on gross trade flows, are lacking in this regard.

The deficiencies of data on gross trade flows are well illustrated by the iPhone, which is exported as a finished product from China with components made in, among other countries, Japan, South Korea, and Taiwan. Although China contributes only about 5 percent of the total value added embodied in an iPhone, the United States (US) records its imports of iPhones as 100 percent

"Chinese" in its gross trade flow data. In this and other ways, gross trade flow data fail to capture the growing complexity of interconnectedness among national economies on wide-ranging issues such as economic growth, employment shifts, income distribution, and CO_2 emissions.[3]

To address the deficiencies of gross trade flow data, the OECD and World Trade Organization (WTO) jointly launched a "Made in the World" initiative in 2011 that resulted in the October 2015 release of a Trade in Value Added (TiVA) database measuring "trade in tasks" rather than "trade in goods."[4] Accordingly, TiVA's methodology is designed to capture only the value added by each country as "goods in process" traverse GVCs. In other words, TiVA aims to provide more nuanced data on who is doing what with whom through international trade.

One subject where more nuanced data is especially welcome is China's international economic relations. Although not all of China's international commerce is conducted through GVCs, its emergence as the world's second largest economy and largest trading nation has occurred, not coincidentally, in an era of unprecedentedly globalized production. In an effort to examine China's role in the world economy as comprehensively as possible, as well as to enrich our understanding of China's economic position relative to other international actors (i.e., various countries and groupings), this paper explores the newly available TiVA database for value added flows achieved through cross-border trade. Specifically, the paper compares gross trade data to value added data in order to see how the representation of international economic relations – both in general and as regards China's relations in particular – changes depending on which set of data is used.

Indeed, this empirical exercise is the centerpiece of the paper. As such, the paper is exploratory in nature and relies on the presentation of descriptive statistics in its analysis. The goal, simply put, is to investigate the utility of data on value added trade flows as a complement to data on gross trade flows. In what ways and by how much do international economic relationships vary as viewed from the lens of gross trade data as opposed to the lens of value added trade data? In particular, how does the nature and degree of China's economic interconnectedness with specific actors (i.e., countries, groupings) differ depending on which kind of trade data used? And how has this changed over time?

As a political scientist who specializes in international relations, I'm interested in the global dispersion of economic activity not only for its economic effects but also for the geopolitical and security implications of transnational production sharing, such as how the creation and capture of value within GVCs can affect the international distribution of power. There is, for example, both the overarching macro issue of how the gains in economic welfare generated by GVCs are distributed across participating countries and the underlying micro issue of how various production-sharing tasks are distributed across participating countries in specific industries. These issues, in turn, raise the question of whether increasing specialization among countries through transnational production sharing has changed the nature and/or degree of international economic interdependence. This paper represents a first-cut effort at using the OECD-WTO TiVA database to undertake analysis of how China and various actors (i.e., countries, groupings) may be intertwined economically in ways different from what gross trade flow data would suggest.

Unless otherwise noted, all figures presented in this paper represent calculations I made based on data extracted from the October 2015 release of the TiVA database. Before proceeding, it is worth noting some basic features of the OECD-WTO TiVA database that serve as important parameters of this paper. Although the TiVA database offers aggregate data for the world economy as a whole, it only provides actor-specific data for 61 individual territorial actors (59 countries plus Hong Kong and Taiwan). In addition, the database offers pre-packaged data for regions such as "Eastern Asia" (Japan, South Korea, China, Hong Kong, and Taiwan) and "East and South East Asia" (Eastern Asia plus the members of the Association of Southeast Asian Nations). In order to achieve greater accuracy and simplicity of terminology, I refer in the paper to TiVA's Eastern Asia as "Northeast Asia" and to TiVA's East and South East Asia as "East Asia."

Although the database offers region-specific data for several institutionalized groupings, such as the European Union (EU), the North American Free Trade Agreement (NAFTA), and the Association of Southeast Asian Nations (ASEAN), data on other official or quasi-official groupings is not provided. I have therefore used the data provided for individual territorial actors to calculate grouping data for the BRICS (Brazil, Russia, India, China, and South Africa), the Trans-Pacific Partnership (TPP), and the Regional Comprehensive Economic Partnership (RCEP). The TiVA database lacks country-specific data for Peru, so my grouping data for the TPP – as noted throughout the paper – does not include Peru. As I also note throughout the paper, the EU reflects data for the EU-28 for all years. Due to the fact that the database lacks country-specific data for Laos and Myanmar, I have labeled all figures in the paper that use the OECD-WTO pre-packaged data for ASEAN as "ASEAN-8."

Given the laborious and complicated work involved in constructing data on value added flows in international trade, the October 2015 release of the TiVA database covered only a small number of years: 1995, 2000, 2005, 2008, 2009, 2010, and 2011. Given the exploratory nature of this paper, I have used data for 1995 and 2011 as bookends to capture the greatest passage of time. Finally, it is worth noting that this paper uses the gross trade flow data provided by the TiVA database even though it differs slightly from the data on gross trade flows published in other international datasets, including those available from the OECD and WTO themselves. The OECD and WTO made minor adjustments to their existing gross trade data in building the TiVA database in order to facilitate the most accurate comparison between gross trade flows and value added trade flows.

The World's Biggest Exporters in 1995 and 2011

The TiVA database allows us to compare a country's gross exports to its exports of value added, both overall and with respect to specific partners. Exports of value added, which is technically identified in the TiVA database as "domestic value added embodied in foreign final demand," is essentially a subset of gross exports given that a country's gross exports embody not only its own value added but also value added from other countries. (Think of Apple's iPhone as a prime example.) Thus, a country's exports of value added are always smaller in absolute terms than its gross exports. The size of the differential varies from country to country, however. Because this gap is smaller for some countries than others, a country's shares of world exports of value added can be larger than its share of world gross exports even though, by definition, its own gross exports will always be larger than its own exports of value added.

Using within-year analysis, Figure 1 shows the close relationship that exists between a country's gross exports and its exports of value added. Although the differential in the size of a country's shares of world gross exports and world exports of value added in any given year is typically modest, especially for major economic powers such as 1995's top ten gross exporters depicted in the figure, these differences should not be dismissed as inconsequential. For example, Figure 1 shows that the gap between some countries' shares of gross exports and exports of value added (e.g., Japan in 1995 and South Korea in 2011) is, in relative terms, larger than the gap between other countries' shares (e.g., the UK in 1995 and France in 2011). Moreover, Figure 1 shows that the direction of the differential varies as well, as gross exports exceed exports of value added for some countries (e.g., South Korea and China in both 1995 and 2011) while exports of value added exceed gross exports for other countries (e.g., the US and Japan in both 1995 and 2011).

As shown in Figure 1, differences in a country's world ranking in gross exports and exports of value added never exceeded two places in either 1995 or 2011. Yet, some of these differences are nevertheless noteworthy. For example, in 2011 South Korea ranked eighth in world gross exports but only tenth in world exports of value added, an outcome that likely reflected the fact that South Korea's exports embodied relatively high levels of foreign value added given its vibrant role in transnational manufacturing networks that entail the extensive use of imported components. Another noteworthy difference shown in the figure is that, although China held the top spot in gross exports in 2011, having eclipsed the US in this regard, it still trailed the US in exports of value added. In fact, the US's lead over China in exports of value added in 2011 was far greater than China's lead over the US in gross exports in 2011 (1.54 percentage points vs. 0.31 percentage points). Thus, while China's ascent to the top spot in world gross exports has deservedly received great attention, one utility of comparing gross trade flows with valued added trade flows is the further context such analysis provides as we try to interpret trade dynamics not only worldwide but also among different actors in an era of increasingly globalized production.

Moving from within-year analysis to cross-year analysis, Figure 1 documents a broad decline in the shares of world exports held by the G-7 countries (and the Netherlands) between 1995 and 2011. Despite these declining shares, however, the overall rankings among world exporters changed little during this period except for the truly dramatic emergence of China. The G-7 all remained in the top ten and South Korea essentially held steady; the only change in the composition of the top ten from 1995 to 2011 was the replacement of the Netherlands by Russia. Moreover, it should also be noted that the relative importance of the G-7 countries to world exports declined despite robust increases in the absolute value of their exports. For example, the US's share of world gross exports declined by 3.45 percentage points between 1995 and 2011 despite the fact that, in terms of absolute value, US gross exports grew by nearly 2.5 times over that period.

When the analysis is expanded to countries outside the world's top ten gross exporters, as it is in Figure 2, the data reveals more prominent within-year differences. For example, Taiwan's rankings in gross exports and exports of value added differed by five places in 2011 (fifteenth and twentieth place, respectively). Along the same lines, Brazil's rankings differed by five places in 1995 (twenty-fifth and twentieth place, respectively.) Mexico's rankings in 2011 differed by three places, as did Brazil's rankings in 1995. It is also worth noting that while Russia, Brazil,

and India each held shares of world exports of value added that exceeded their shares of world gross exports, the opposite was the case for Taiwan and Mexico. This finding is consistent with the expectation that gross exports from Taiwan and Mexico – both of which participate more intensively in elongated global manufacturing networks incorporating numerous partners – are likely to embody more foreign value added than are gross exports from Russia, Brazil, and India.

With respect to cross-year analysis, Figure 2 documents that China was not alone among the BRICS countries in becoming a more prominent exporter between 1995 and 2011. Although India's leap was particularly pronounced, Brazil and (especially) Russia made strong gains as well. With exports from these large economies surging, it is perhaps not surprising that a smaller economy such as Taiwan saw its relative position among world exporters decline even though its gross exports grew by more than 2.5 times in absolute terms between 1995 and 2011. For its part, Mexico's relative position among world exporters improved only marginally even though its gross exports grew nearly four-fold in absolute terms between 1995 and 2011.

In addition to presenting data for selected countries outside the world's top ten exporters, Figure 2 also provides data for several large groupings. It is important to note that OECD data on EU-28, NAFTA, ASEAN-8, Northeast Asia, and East Asia reflect only extra-EU, extra-NAFTA, extra-ASEAN, extra-Northeast Asia, and extra-East Asia exports. In other words, the data does not reflect trade within the groupings. This approach facilitates focusing on these entities' interactions with the rest of the world.

Although the data for the EU and NAFTA reflect only extra-EU 28 and extra-NAFTA exports, they are broadly consistent with the data presented in Figure 1 for the individual G-7 countries insofar as their shares of both world gross exports and world exports of value added declined noticeably from 1995 to 2011. Another characteristic of the data for the EU and NAFTA worth mentioning is that, in both 1995 and 2011, each actor's share of world exports of value added exceeded its share of world gross exports.

For its part, ASEAN saw modest gains in its shares of both world gross exports and world exports of value added between 1995 and 2011. In further contrast to the EU and NAFTA, ASEAN's share of world gross exports exceeded its share of world exports of value added in both years.

As Figure 2 shows, Northeast Asia's shares of world gross exports and world exports of value added increased between 1995 and 2011. It is also notable that Northeast Asia's share of world exports of value added exceeded its share of world gross exports in both 1995 and 2011. (Given that Northeast Asia is the primary component of East Asia, it is not entirely surprising that trends in the latter track the former closely. Thus, no separate analysis of East Asia is required here.)

By way of conclusion, it is striking that shares of world exports of value added exceeded shares of world gross exports in each of the three richest economic centers in the world – Europe, North America, and Northeast Asia – in both 1995 and 2011. While this trio of actors is dominant in gross exports too, its prominence is even greater in exports of value added.

The World's Biggest Importers in 1995 and 2011

The TiVA database allows us to compare a country's gross imports to its imports of value added, both overall and with respect to specific partners. Imports of value added, which is technically identified in the TiVA database as "foreign value added embodied in domestic final demand," is essentially a subset of gross imports given that some of the foreign value added embodied in a country's gross imports is ultimately used in exports rather than retained. (China's imports of components used in fabricating Apple's iPhone would be a prime example.) Thus, a country's imports of value added are always smaller in absolute terms than its gross imports. The size of the differential varies from country to country, however. Because this gap is smaller for some countries than others, a country's shares of world imports of value added can be larger than its share of world gross imports even though, by definition, its own gross imports will always be larger than its own imports of value added.

Using within-year analysis, Figure 3 shows the close relationship that exists between a country's share of world gross imports and its share of world imports of value added. While the gap is typically close, it should be noted that the gap between some countries' shares of gross imports and imports of value added (e.g., US in 2011, Japan in 1995, South Korea in 2011) is relatively larger than the gap between other countries' shares (e.g., Germany in 1995, Italy in 2011, and Canada in 2011). In only two cases does Figure 3 show that a country's world rankings in gross imports and imports of value added varied by more than one place in a given year: for South Korea in 2011 and for China in 1995, their world rankings were three places higher for gross imports than for imports of value added.

Although the gap in any given year between a country's shares of world gross imports and world imports of value added is relatively small in most cases, differences in the direction of such gaps across various countries are more noteworthy. Specifically, Figure 3 shows that, for some countries, the share of world gross imports regularly exceeds the share of world imports of value added (e.g., South Korea and China in both 1995 and 2011), while for other countries the share of world imports of value added regularly exceeds the share of world gross imports (e.g., the US and Japan in both 1995 and 2011). This pattern can likely be attributed to the different roles played by various countries within transnational manufacturing networks. Compared to the US and Japan, for example, South Korea and China concentrate more on importing components that are used in fabricating refined components or finished goods, both of which are then often exported. Consequently, it is not surprising that South Korea's and China's shares of the world's gross imports exceeds their shares of the world's imports of value added. By contrast, the US and Japan remain – at least in relative terms – more prominent markets for imports of finished goods. Thus, it is not surprising that their shares of world imports of value added exceed their shares of world gross imports.

Moving from within-year analysis to cross-year analysis, Figure 3 shows a broad decline between 1995 and 2011 in the shares of both world gross imports and world imports of value added held by the G-7 countries. Overall, however, the decline was more modest in imports than it was in exports. The G-7 all remained in the top ten, and the only change in the composition of the top eight world importers was China's replacement of Canada, with South Korea essentially remaining steady in eighth place. Moreover, it should also be noted that the relative importance of the G-7 countries to world imports declined despite robust increases in the absolute value of their imports. For example, the US's share of world gross imports declined by 2.10 percentage

points between 1995 and 2011 despite the fact that US gross imports grew nearly three-fold in absolute value during that period.

It is important to note that the US yielded less ground in its share of world gross imports than it did in its share of world gross exports (2.10 percentage points vs. 3.45 percentage points). Indeed, it retained a sizable lead as the world's top importer despite experiencing modest decreases in its share of both world gross imports and world imports of value added. Although China's profile among world importers grew immensely between 1995 and 2011, it did not eclipse the US like it did in exports.

It is particularly notable that the decline in the US's share of world imports of value added (a 6.41% decrease from 1995 to 2011) was less than half the size of the decline in its share of world gross imports (a 13.85% decrease from 1995 to 2011). With the ongoing globalization of production during this period, it is not surprising that the US's share of world gross imports declined more than its share of world imports of value added.

When the analysis is expanded to countries outside the world's top eight gross importers, as it is in Figure 4, the data reveals more prominent within-year differences. For example, Taiwan's rankings in world gross imports and world imports of value added differed by four places in 2011 (sixteenth and twentieth place, respectively). Along the same lines, Brazil's rankings differed by five places in 1995 (twenty-third and eighteenth place, respectively.) It is also worth noting that while Russia, Brazil, and India each held shares of world imports of value added that exceeded their shares of world gross imports, the opposite was the case for Taiwan and Mexico. This finding is consistent with the expectation that Taiwan and Mexico – both of which participate more intensively than Russia, Brazil, and India in global manufacturing networks – are more likely to retain less value added from their imports overall as they use foreign inputs extensively to produce refined components or finished goods for export.

With respect to cross-year analysis, Figure 4 documents that China was not alone among the BRICS countries in becoming a more prominent importer between 1995 and 2011 in terms of both world gross imports and world imports of value added. While India's leap was particularly pronounced, Brazil and Russia made strong gains as well. So too did Mexico. With imports to these large economies surging, it is perhaps not surprising that a smaller economy such as Taiwan saw its relative position among world importers decline. Its rank in gross imports fell from thirteenth to sixteenth even though the absolute value of its gross imports grew by more than 2.5 times between 1995 and 2011. Taiwan's rank in imports of value added plummeted from eleventh to twentieth despite the fact that its imports of value added nearly doubled in absolute terms during this period. This example speaks to the utility of comparing gross flows with valued added flows as a means of gaining further insight about the implications of globalized production for trade relations. Simply put, the magnitude of Taiwan's role as an importer looks different when viewed through the lens of imports of value added as opposed to the lens of gross imports.

In addition to presenting data for selected countries outside the world's top eight importers, Figure 4 also provides data for several large groupings. It is important to note that OECD data on EU-28, NAFTA, ASEAN-8, Northeast Asia, and East Asia reflect only extra-EU, extra-NAFTA,

extra-ASEAN, extra-Northeast Asia, and extra-East Asia imports. In other words, the data does not reflect trade within the groupings. This approach facilitates focusing on these entities' interactions with the rest of the world.

The data for the EU is remarkably consistent between 1995 and 2011 in two important respects. First, the EU's shares of world gross imports and imports of value added were essentially identical for the two years. There was even less change in the EU's shares over this period than there was in the US's shares. Moreover, there was much less change in the EU's shares than in the shares of individual members such as Germany, France, the UK, and Italy. This undoubtedly owes to the fact that the data for the EU reflects only extra-EU trade. A second point of consistency is that the EU's share of world imports of value added was higher than its share of world gross imports in both years. This is in keeping with the analysis offered above regarding the US, namely that prominent end markets for finished goods can be expected have stronger profiles as importers of value added than as gross importers.

This dynamic is plainly evident in the case of NAFTA, as its share of world imports of value added considerably outstripped its share of world gross imports in both 1995 and 2011. Notably, in fact, NAFTA's share of world imports of value added grew from 1995 to 2011 despite the fact that its share of world gross imports actually declined. Across the entire set of figures on world exporters and importers presented in this paper, NAFTA's imports are the only example in which the direction of an actor's shares in gross flows and value added flows did not move together. Simply put, between 1995 and 2011 NAFTA became a less prominent importer in gross terms while becoming a more prominent importer in value added terms. Consistent with what one might expect as the globalization of manufacturing production deepened over this period, other actors became relatively more important destinations for gross imports given the increasing transnational flows of components used within supply chains to produced finished goods. Although the absolute value of NAFTA's gross imports increased robustly between 1995 and 2011, it did not increase as fast as the absolute value of gross imports by other actors. Thus, its share of world gross imports decreased. By contrast, NAFTA did increase its share of world imports of value added as cross-national production increased.

Northeast Asia serves as a partial counterpoint to NAFTA insofar as its share of world gross imports rose simultaneously with its share of world imports of value added. What is truly distinctive about Northeast Asia, however, is that its share of world gross imports grew so rapidly between 1995 and 2011 relative to its share of world imports of value added that by 2011 Northeast Asia was more prominent in terms of world gross imports than world imports of value added. Unlike the case of NAFTA, Northeast Asia's shares of world gross imports and world imports of value added moved in the same direction – higher – but at such different rates that Northeast Asia switched from being more prominent in 1995 in world gross imports to being more prominent in 2011 in world imports of value added.

As depicted in Figure 4, the data on East Asia reflects a more conventional story in which changes from 1995 to 2011 were more uniform across its shares of world gross imports and world imports of value added, with the result being that there were no dramatic shifts in the relative significance of the two sets of flows like there had been for NAFTA and Northeast Asia. If East Asia has a big story, it is perhaps how much the gap has shrunk between itself and the EU

and NAFTA as importers. While East Asia in 2011 still lagged slightly behind the EU and NAFTA in terms of imports of value added, in terms of gross imports it had already eclipsed NAFTA and barely trailed the EU.[5]

Although ASEAN's shares of both world gross exports and exports of value added increased from 1995 to 2011, its shares of world gross imports and world imports of value added decreased during this period despite the fact that the absolute value of its imports rose strongly. Whereas ASEAN's exports therefore grew slightly more rapidly than exports from elsewhere, ASEAN's imports grew slightly less rapidly than imports from elsewhere. One point of continuity between ASEAN's export and import profile is that, in 1995 and 2011 alike, ASEAN's trade in gross terms has exceeded its trade in value added terms.

By way of conclusion, it is worth reiterating that, in 1995 and 2011, the share of world imports of value added exceeded the share of world gross imports in two of the three richest economic centers in the world: Europe and North America. In the third center – Northeast Asia – this relationship held in 1995 but by 2011 the region's share of world gross imports outstripped its share of world imports of value added, likely reflecting the deepening globalization of production during this period. While the EU and NAFTA continue to figure prominently in world gross imports, their collective share of gross imports did decline modestly between 1995 and 2011 (from 26.81 percent to 25.84 percent). As regards world imports of value added, however, their collective share increased slightly from 29.16 percent to 29.18 percent. In this sense, the collective importance of the EU and NAFTA to world imports of value added grew even though its collective importance to world gross imports fell. By contrast, Northeast Asia's importance to world gross imports and world imports of value added both grew strongly (from 10.56 percent to 13.11 percent and from 11.17 percent to 12.94 percent, respectively). Notably, however, these gains meant that the region's importance to world gross imports grew 50 percent more quickly between 1995 and 2011 than its importance to world imports of value added did.

China's Biggest Export Partners in 1995 and 2011
Using within-year analysis, Figure 5 shows the close relationship that exists between China's gross exports and exports of value added to individual partners. Although the differential in the size of a country's shares within China's export profile in any given year is typically modest, these differences should not be dismissed as inconsequential. For example, Figure 5 shows that the gap between some countries' shares of China's gross exports and exports of value added (e.g., Japan in 1995, South Korea in 2011, and Taiwan in 2011) is relatively larger than the gap between other countries' shares (e.g., Japan in 2011, Germany in 1995 and 2011, and France in 1995 and 2011). Moreover, Figure 5 shows that the direction of the differential varies as well among China's export destinations, with the share of its gross exports exceeding the share of its exports of value added for some destinations (e.g., Hong Kong in 1995, South Korea in 2011, and Taiwan in 2011) while exports of value added exceeded gross exports for other destinations (e.g., the US in 2011 and Japan in 1995).

Figure 5 reveals only one case in either 1995 or 2011 in which the difference between a country's rankings in China's gross exports and China's exports of value added was greater than one place: In 2011, Taiwan ranked tenth in China's gross exports but only fifteenth in China's exports of value added. One possibility is that a larger portion of China's exports to Taiwan –

relative to its exports to other partners – consisted of foreign value added (as opposed to domestic value added). Another possibility is that, relative to China's other export destinations, Taiwan used more of the Chinese value added embodied in China's exports as input for its own export production. In both scenarios, the outcome can be traced back to the specific nature of the China-Taiwan trade relationship, in particular their sizable, mutually reinforcing roles in transnational manufacturing networks that make extensive use of imported components in sophisticated supply chains.

Although South Korea's rankings in China's gross exports and China's exports of value added differed by only one place in 2011 (third and fourth, respectively), far less than the five places that marked Taiwan's rankings in 2011, the gap in size between its shares of China's gross exports and its shares of China's exports of value added was almost identical in percentage terms to the size of the gap in Taiwan's shares (30 percent vs. 32 percent). Given the broad similarities in the roles played by South Korea and Taiwan in globalized production, particularly in terms of their relations with China, it is perhaps not surprising that these two partners exhibit parallel characteristics in terms of being far more important destinations for China's gross exports than its exports of value added.

Moving from within-year analysis to cross-year analysis, Figure 5 documents the steeply declining importance of Japan and Hong Kong as destinations for China's exports. To be sure, Japan retained its spot as the second-ranked destination for China's exports, but its shares of gross exports and exports of value added were both essentially halved from 1995 to 2011. Hong Kong's shares were decimated, with its rankings falling accordingly. The US and Germany saw their shares decline gently, allowing them to retain their rankings in China's export profiles. (Germany climbed one spot in China's exports of value added.) The UK and France recorded modest gains in shares and ranks alike.

Figure 5 starkly reveals that the US's dominance relative to China's other export partners grew substantially between 1995 and 2011. To be sure, the US's shares declined during this period but by 2011 its shares had actually grown to be more than twice as large as China's next ranked partner (Japan). Remarkably, the US's share of China's gross exports was larger than the combined shares of the partners ranked second through fourth (Japan, Germany, and South Korea). The US's dominance was even greater in China's exports of value added, where its share in 2011 was larger than the combined shares of the partners ranked second through fifth (Japan, Germany, South Korea, and India).

Figure 6 extends the analysis to additional partners. Given the predominance of the US as a destination for China's exports, Figure 6 shows the US again in order for the scale to be the same as that of Figure 5. Otherwise, the visual comparison between partners on the two figures would be distorted.

Using within-year analysis, Figure 6 provides additional evidence of the close relationship that exists between China's gross exports and exports of value added to most partners. Although the differential in the size of a country's shares in China's export profile is typically modest, these differences should not be dismissed as inconsequential. For example, Figure 6 shows that the gap between some countries' shares of China's gross exports and exports of value added (e.g.,

Canada in 2011, and Mexico in 2011) is relatively larger than the gap between other countries' shares (e.g., Italy in 1995, Australia in 1995, India in 2011). Moreover, Figure 6 shows that the direction of the differential varies as well, with some countries' shares China's gross exports exceeding their share of its exports of value added (e.g., Mexico in 2011) while for other destinations their share of China's exports of value added exceeded their share of China's gross exports (e.g., Canada in 2011 and Russia in 1995).

Figure 6 identifies a total of two countries in 1995 and 2011 for which a given year's rankings in China's gross exports and exports of value added differed by three places or more: Brazil and Mexico. For its part, Brazil ranked noticeably higher in China's exports of valued added than in China's gross exports in both 1995 and 2011 (24th vs. 31st and 12th vs. 15th, respectively). Given that Mexico's share of China's gross exports ranked much higher than its share of China's exports of value added in 2011 (12th vs. 17th), dynamics similar to those outlined above for Taiwan and South Korea regarding their participation in transnational manufacturing networks likely apply to the Mexican case as well.

Moving from within-year analysis to cross-year analysis, Figure 6 starkly reveals that, despite impressive gains recorded by countries such as India, Mexico, and Brazil from 1995 to 2011, the US's position in China's export profile remained unparalleled. Figure 6 also extends a pattern depicted in Figure 5 in which the shares of China's exports held by four G-7 countries – the UK and France in Figure 5, Italy and Canada in Figure 6 – increased modestly from 1995 to 2011. These four G-7 countries were joined by Japan and Germany in 2011 as partners whose shares of China's exports of value added exceeded their shares of China's gross exports. (Japan and Germany saw their shares of both gross exports and exports of value added fall, but their shares of exports of value added were both higher than their shares of gross exports.) Although Australia is not a G-7 country, its profile as a destination for Chinese exports matches that of the UK, France, Italy, and Canada.

While India's rise as a destination for China's exports was particularly spectacular from 1995 to 2011, Brazil and Russia also experienced gains in shares. Interestingly, Russia and India both switched from holding higher shares of China's exports of value added in 1995 to holding higher shares of China's gross exports in 2011. Brazil represents an interesting case of how its position in China's export profile depends on whether gross exports or exports of value added are used. If gross exports are used, Brazil (ranked fifteenth) is a decidedly less important destination for Chinese exports than Mexico (ranked twelfth) in 2011. Alternatively, if exports of value added are used, Brazil (ranked twelfth) is a much more important destination for Chinese exports than Mexico (ranked seventeenth).

Figure 7 further extends the analysis to China's exports with various groupings. Using within-year analysis, Figure 7 provides still more evidence of the close relationship that exists between China's gross exports and exports of value added to various groupings. Although the differential in the size of a grouping's shares in China's export profile is typically modest in any given year, these differences should not be dismissed as inconsequential. For example, Figure 7 shows that the gap between some groupings' shares of China's gross exports and exports of value added (e.g., East Asia in 2011, EU in 2011, ASEAN in 2011) is relatively larger than the gap between other groupings' shares (e.g., TPP in 2011 and Northeast Asia in 1995). Moreover, the figure

reveals how the direction of the differential varies as well, with the share of China's gross exports going to some groupings exceeding the share of its exports of value added to these groupings (e.g., Northeast Asia in 2011, ASEAN in 1995 and 2011) while the share of China's exports of value added going to other groupings exceeded China's gross exports to these groupings (e.g., NAFTA in 2011 and EU in 2011).

It must be emphasized that the rankings provided in Figure 7 simply reflect the order of the particular groupings selected; the order would change if a different set of groupings were selected. Moreover, it must be acknowledged that the groupings represent different types of entities. Some groupings are long established, formal institutions such as the EU and ASEAN while others, such as TPP and RCEP, are prospective groupings and are thus presented to provide additional context rather than as entities to be analyzed in depth. (The TPP, moreover, includes data for the US.) The remaining groupings depicted in Figure 7 are de facto blocs of countries based on home region (e.g., Northeast Asia and East Asia) or geopolitical affinity (BRICS).

Moving from within-year analysis to cross-year analysis, the big story conveyed by Figure 7 concerns the decline of Northeast Asia and East Asia in China's export profile. Although China's exports to these regions increased in absolute terms from 1995 to 2011 – for gross exports and exports of value added alike – they fell in relative terms as the shares of both China's gross exports and exports of value added accounted for by East Asia and Northeast Asia fell steeply. In addition, while there was essentially no gap between each grouping's shares of China's gross exports and exports of value added in 1995, by 2011 both held higher shares of China's exports of value added than China's gross exports.

Figure 7 shows robust gains in share by the BRICS and more modest gains by ASEAN. These gains notwithstanding, ASEAN and the BRICS still lagged far behind NAFTA and the EU in China's export profile by 2011. Although NAFTA's share of China's gross exports took a tiny dip between 1995 and 2011, its share of China's exports of value added increased slightly. In the end, its rankings in both categories rose as the shares of Northeast Asia and East declined. The EU's shares grew modestly over this period, allowing it to essentially match the level of Northeast Asia in 2011. One interesting development common to both NAFTA and the EU was the switch from holding a higher share of China's gross exports in 1995 (rather than exports of value added) to a higher share of China's exports of value added in 2011 (rather than gross exports).

The withdrawal of the US from TPP obviously changes the significance of that grouping's position in China's export profile, but the figure does depict powerfully how much China has relied historically on TPP members as export markets – – considerably more than RCEP members. With TPP on the wane, however, RCEP would vault to the top spot in 2011, outstripping both NAFTA and the EU even though RCEP's shares of China's gross exports and exports of value added both declined from 1995 to 2011.

The Share of Domestic Value Added in China's Exports in 1995 and 2011
Although many observers would argue against placing too much emphasis on trends in the relative contribution of domestic value added (DVA) and foreign value added (FVA) in a

country's exports, especially given the myriad benefits that can accrue to countries that increase their exports by deepening their participation in transnational manufacturing networks, the share of DVA in exports remains a perennial issue for many governments, including China's. Figure 8 shows changes between 1995 and 2011 in the share of DVA embodied in China's gross exports to selected partners, documenting that the share of DVA ranged widely not only from partner to partner but also often for a given partner over time. In 1995, the share of DVA in China's gross exports ranged from 79.74 percent (Taiwan) to 53.30 percent (Mexico). In 2011, it ranged from 78.26 percent (Singapore) to 60.2 percent (Mexico).

As Figure 8 shows, the share of DVA changed significantly for many countries between 1995 and 2011. Indeed, the share of DVA changed 5 percent or less in China's exports to only five countries: Japan, Italy, South Korea, Hong Kong, and the US. The share of DVA changed more than 5 percent in China's exports to all the other partners selected for the figure, including 23 percent and 18 percent in exports to Singapore and Taiwan, respectively. Although the share of DVA increased for more than two thirds of the partners I selected for examination, Figure 8 presents an interesting mix of cases for which the share of DVA increased or decreased. Even among partners for whom the share of DVA in Chinese exports increased over time, the rates of increase diverged considerably even among G-7 members: Italy (3 percent), US (5 percent), Canada (9 percent), Germany (9 percent), France (15 percent), and the UK (16 percent). Interestingly, it does not seem that these differentials in the rate of increase can be attributed simply to a "catching up" process based on a lower initial share. In the cases of China's exports to France and the UK, for example, the share of DVA went from lower than the share of DVA in China's exports to the US to higher than the share of DVA in China's exports to the US.

Another puzzle raised by Figure 8 is why the share of DVA in China's exports to Singapore soared while the share of DVA in China's exports to Taiwan plummeted. In the case of Taiwan, it could be surmised that, as China's participation in transnational manufacturing networks deepened, its exports to Taiwan embodied more FVA given the sourcing of inputs through sophisticated supply chains. Indeed, changes in the shares of DVA in China's exports to Hong Kong, South Korea, and Japan would seem consistent with this explanation, although the shares of DVA in China's exports to these partners did not decline nearly as much as it did in the case of Taiwan. According to this reasoning, China's exports to Singapore would be the outlier.

Figure 9 extends the analysis by documenting changes in the share of DVA embodied in China's gross exports to selected groupings. As was the case with individual partners, the share of DVA in China's exports ranges not only from grouping to grouping but also for a given grouping over time. In 1995, the share of DVA in China's gross exports ranged from 71.31 percent (Northeast Asia) to 61.91 percent (NAFTA). In 2011, it ranged from 69.71 percent (EU) to 65.11 percent (NAFTA). (Notably, the range in share among groupings, as depicted in Figure 9, is much narrower than the range in share among individual partners, as depicted in Figure 8.)

The largest increases in the share of DVA in China's exports – in terms of percent change – belonged to China's exports to the EU (12 percent) and NAFTA (5 percent). The biggest decreases in the share of DVA in China's exports – in terms of percent change – belonged to China's exports to Northeast Asia (5 percent) and East Asia (4 percent). In the latter two cases, the decreases might owe once again to the impact of China's deepening participation in

transnational manufacturing networks. It could be surmised, for example, that China's exports to its neighbors in Northeast Asia (Japan, South Korea, Taiwan, and Hong Kong) may have shifting toward embodying more foreign value added (FVA) over time as these exports began to reflect, relative to past practices, the increased sourcing of foreign inputs through sophisticated supply chains. While it could have been expected, therefore, that the share of DVA in China's exports to Northeast Asia and East Asia might experience a decline from 1995 to 2011, it is not clear why the rankings of the two regions plummeted from first and second, respectively, to sixth and fifth, respectively.

As striking as that development was, the biggest story depicted in Figure 9 is arguably how the share of DVA in China's exports to the EU rose from being the second smallest in 1995, when it barely exceeded the last-place share of China's exports to NAFTA, to the highest share in 2011. By contrast, the share of DVA in China's exports to NAFTA was lowest in both 1995 and 2011. Although it could have been expected that the share of DVA in China's exports to the EU would increase over time, the fact that the share vaulted from seventh to first in the rankings is far more surprising.

China's Biggest Import Partners in 1995 and 2011
Using within-year analysis, Figure 10 shows that the close relationship we saw in Figures 5 and 6 between China's gross exports and exports of value added to individual partners is less pronounced in the case of China's gross imports and imports of value added. Indeed, the differential in size between a partner's shares of gross imports and imports of value added in any given year is not as routinely small as it was in exports, even though the difference in a country's rankings for gross imports and imports of value added does not always reflect the size of the gap in its shares. Figure 10 shows several cases where a country's rankings were the same or differed by only one place despite a significant gap in share size (e.g., US in 1995 and 2011, Korea in 2011), whereas in other cases smaller gaps in shares resulted in wider-ranging rankings (e.g., Germany in 1995 and Russia in 1995).

Rankings aside, Figure 10 shows numerous examples in which the size of a country's shares of China's gross imports and imports of value added varied significantly for a given year. Taiwan and South Korea are prime examples. In both 1995 and 2011, Taiwan and South Korea each supplied shares of China's gross imports that were substantially larger than the shares of China's imports of value added they supplied. This size of this gap reflects the nature of China's trade relations with Taiwan and South Korea, two partners that play distinctive roles in transnational manufacturing networks alongside China. These networks, of course, make extensive use of imported components in sophisticated supply chains. It's likely that a larger portion of China's imports from Taiwan and South Korea – relative to its imports from other partners – consisted of foreign value added that originated from third party countries as opposed to being value added directly from Taiwan or South Korea.

In addition to these differences, Figure 10 also documents how the direction of the share gaps varied across partners. While the shares of China's gross imports accounted for by certain countries exceeded their shares of China's imports of valued added (e.g., Taiwan and South Korea), the shares of imports of value added accounted for by other countries exceeded their shares of China's gross imports (e.g., US and Australia).

Moving from within-year analysis to cross-year analysis, Figure 10 documents the steeply declining importance of Japan as a source of China's imports. To be sure, Japan retained its spot as the top-ranked supplier of China's imports, but its shares of China's gross imports and imports of value added were both nearly halved from 1995 to 2011. It is also worth noting that Japan shifted from supplying a higher share of China's imports of value added in 1995 (as opposed to gross imports) to supplying a higher share of China's gross imports in 2011 (as opposed to imports of value added). Russia switched in the opposite direction over the same period. Although the US and South Korea still trailed Japan's position in China's import profile by 2011, they trailed by much less than they had in 1995. The bottom line is that no partner stands out in China's import profile the way the US stands out in China's export profile.

Looking at the big picture, it is worth noting that four of China's top five import suppliers in 1995 saw their shares decline by 2011. (South Korea, the outlier, saw its share of China's gross imports rise strongly during this period, but its share of China's imports of value added barely increased.) Furthermore, the four that experienced a decline in their shares saw those shares decline significantly.

Figure 11 extends the analysis to additional partners. Given Japan's rank as the top source of China's imports, Figure 11 shows Japan again in order for the scale to be the same as that of Figure 10. Otherwise, the visual comparison between partners on the two figures would be distorted.

Using within-year analysis, Figure 11 shows additional evidence that the close relationship we saw in Figures 5 and 6 between China's gross exports and exports of value added to individual partners is less pronounced in the case of China's gross imports and imports of value added. There are several cases where a country's rankings were the same or differed by only one place despite a significant gap in share size (e.g., France in 1995 and Saudi Arabia in 2011), whereas in other cases smaller gaps in shares resulted in wider-ranging rankings (e.g., Singapore in 1995 and Saudi Arabia in 1995).

Rankings aside, Figure 11 shows several examples in which the size of a country's shares of China's gross imports and imports of value added varied significantly for a given year. For example, Malaysia's share of China's gross imports in 2011 was nearly two-thirds larger than its share of China's imports of value added. (In this case, the gap was well captured by the difference in rank: seventh versus twelfth.) A dynamic similar to the one outlined above for Taiwan and South Korea – based on their participation in transnational manufacturing networks – likely applies to the Malaysian case as well.

In addition to these differences, Figure 11 also documents how the direction of the share gaps varies across partners. While the shares of China's gross imports accounted for by some countries exceeds their shares of China's imports of valued added (e.g., Singapore in 1995 and 2011, Malaysia in 2011), the shares of imports of value added accounted for by other countries exceeds their shares of China's gross imports (e.g., France in 1995 and 2011, Brazil in 1995 and 2011, Saudi Arabia in 1995 and 2011).

Moving from within-year analysis to cross-year analysis, Figure 11 notably documents a steep rise in the importance of Brazil, India, and (especially) Saudi Arabia as suppliers of imports to China. This development, along with the growing importance of Australia as a source of China's imports (see Figure 10), points to the increasing role of commodities in China's import profile. The salience of commodities is also underscored by the fact that Australia, Brazil, and Saudi Arabia's shares of China's imports of value added decisively exceeded their shares of China's gross imports in both 1995 and 2011.

The counterpart to the rising shares of Australia, Brazil, India, and Saudi Arabia was the declining shares of Italy, Singapore, and France as suppliers of China's imports. Here, it is worth underscoring that China's imports – gross imports and imports of value added alike – continued to grow robustly from these countries in absolute terms from 1995 to 2011. To say that certain countries lost share is, by definition, a relative assessment.

Figure 12 further extends the analysis to China's imports from various groupings. (The same caveats and other comments about the groupings made in the section on China's exports apply to China's imports as well.) Using within-year analysis, we continue to see the pattern found in Figures 10 and 11 in which the gap in the size of a grouping's shares China's imports is not as routinely small in any given year as it was in exports, even though the difference in a grouping's rankings for gross imports and imports of value added does not always reflect the size of the gap in its shares. In fact, Figure 12 shows only one case in which a grouping's rankings for a given year differed by more than one place – – ASEAN in 2011, when it ranked sixth in China's gross imports and eighth in China's imports of value added.

As regards the direction of the gap, it is important to note that the share of China's gross imports exceeds the share of China's imports of value added for East Asia, Northeast Asia, RCEP, and ASEAN. By contrast, the TPP, the EU, NAFTA, and the BRICS are all groupings for which the share of China's imports of value added exceeds the share of China's gross imports.

Moving from within-year analysis to cross-year analysis, Figure 12 shows that ASEAN and the BRICS, while still both trailing the EU in China's import profile by 2011, had essentially reached NAFTA's shares by that year. The BRICS, in particular, nearly doubled its share of China's gross imports and imports of value between 1995 and 2011. ASEAN, starting from a higher level than the BRICS in 1995, saw its shares grow solidly too. The EU and NAFTA, neither of which ever occupied a position in China's import profile as prominent as it had in China's export profile, sustained losses in their shares of China's gross imports and imports of value added between 1995 and 2011. One further noteworthy development was that the BRICS shifted from accounting for a higher share of China's gross imports in 1995 (as opposed to imports of value added) to a higher share of China's imports of value added in 2011 (as opposed to gross imports).

In many respects, the biggest story conveyed by Figure 12 is the deteriorating positions of Northeast Asia and East Asia in China's import profile between 1995 and 2011. Northeast Asia's shares lost the most ground (28.7 percent in gross imports, 37.2 percent in imports of value added), followed in order by NAFTA, East Asia, and the EU. While the shares of the TPP and RCEP declined too, they lost much less ground. (The withdrawal of the US from TPP obviously

changes the significance of the grouping's position in China's import profile, but Figure 12 does powerfully depict how much China has relied on these countries in the past not just as export markets but also as import suppliers.) The right half of Figure 12 (RCEP to the BRICS, moving from left to right,) shows what a big shadow RCEP members cast on China's import profile relative to the EU, NAFTA, ASEAN (which is part of RCEP), and the BRICS.

China's Trade Balances in 1995 and 2011
One of the most politically contentious issues in China's trade relations over the past two decades, especially with partners such as the US, has been its persistently large bilateral trade surpluses. These surpluses have routinely been cited as evidence that China practices unfair trade. While a comprehensive examination of this complex issue lies well beyond the scope of this paper, we can advance knowledge on the subject by comparing the size of China's bilateral trade balances – deficits as well as surpluses – using gross trade data and value added trade data.

Figure 13 shows China's trade balances in 1995, with a focus on the partners with which it had the largest trade surpluses plus a selection of partners with which it had trade deficits. (In order to preserve some semblance of scale on the figure, China's trade surplus with the US – its largest surplus – is presented in Figure 14, which examines China's trade balances with several groupings.) Moving from left to right on Figure 13, it is not until one gets to Germany and Mexico – in ninth and tenth place, respectively, among China's largest surplus partners – that the rankings are significantly affected by whether gross trade data or value added trade data are used. (I define "significant effect" in terms of whether the rank shifts by more than one place.) For China's top eight surplus partners, including the US on Figure 14, the rankings reflect great continuity overall between gross data and value added data.

Rankings aside, the absolute size of China's trade surpluses does depend tremendously on which data is used. Take Hong Kong and Japan, for example. These two partners are almost mirror images of one another. China's trade surplus with Hong Kong is substantially lower using value added data as opposed to gross data. By contrast, China's trade surplus with Japan is substantially higher – in roughly the same proportion that Hong Kong's was lower – using value added data rather than gross data. In Japan's case, China's trade surplus is much higher using value added data because China's gross imports from Japan were 72 percent larger than its imports of value added from Japan, whereas China's gross exports to Japan were only 44 percent larger than its exports of value added to Japan. As a result of this differential, switching from gross data to value added data results in a considerably larger trade surplus for China.

In the case of the UK, France, and Germany, the size of China's surplus using value added data is less than half the size of its surplus using gross data. In the case of Mexico, China's surplus using value added data was only one quarter the size it was using gross data. For five other countries in China's top ten surplus partners in 1995 (the US, Hong Kong, Spain, India, and Canada), China's value added surpluses were more than half the size of its gross surpluses, but they were still all substantially smaller. (As discussed above, Japan was the only country among China's top ten surplus partners for which China's value added trade surplus was greater than its gross trade surplus.)

As Figure 13 shows, Saudi Arabia is an example of a partner for which China ran a surplus in gross terms but a deficit in value added terms. Neither the surplus nor the deficit was large in an absolute sense, but the shift from a surplus to a deficit underscores the salience of the data choice. Along the same lines, Figure 13 shows how China's trade balance with South Korea shifts from a deficit to a surplus if value added data is used instead of gross data. The shift is driven by the fact that China's gross imports from South Korea were 266 percent larger than its imports of value added from South Korea, whereas China's gross exports to South Korea were only 70 percent larger than its exports of value added to South Korea. Given that that the difference between China's gross imports and imports of value added is so much larger than the difference between its gross exports and exports of value added, the net result was not only a reduction in China's deficit with South Korea but a shift to a surplus. The dynamic underlying these differences can likely be traced, at least in part, to the nature of the China-South Korea trade relationship as shaped by their mutual participation in transnational manufacturing networks. Simply put, China's gross imports from South Korea vastly overstate the amount of South Korean value added that is actually embodied in China's imports. In other words, China's imports contain less South Korean value added than gross trade data would suggest.

While there is no shift from deficit to surplus in the cases of Brazil, Russia, and Taiwan, China's deficits with these partners are much smaller when value added data is used instead of gross data. Indeed, the difference in the size of China's deficits with Taiwan is extraordinary, with the discrepancy driven by the fact that China's gross imports from Taiwan were 300 percent larger than its imports of value added from Taiwan, whereas China's gross exports to Taiwan were only about 40 percent larger than its exports of value added to Taiwan. Because the difference between gross imports and imports of value added is so much larger than the difference between gross exports and exports of value added, China's deficit with Taiwan is vastly smaller in value added terms than in gross terms. Again, the underlying dynamic is tied to the nature of China-Taiwan trade relations as rooted in their mutual participation in transnational manufacturing networks.

Figure 14 further extends the analysis to China's trade balances with various groupings in 1995. Although trade balances are politically relevant mainly as a bilateral issue, it is still worth surveying China's trade balances with groupings. Figure 14 shows, not surprisingly, that China's trade surpluses with TPP and NAFTA using gross data and value added data essentially mirror its trade surpluses with the United States. More surprisingly, China's trade surplus with the EU is vastly smaller than its surplus with the US regardless of whether gross data or value added data is used. Although China's trade deficits with ASEAN and the BRICS are significantly reduced when gross data is replaced with value added data, the most striking change documented in Figure 14 is the shift from deficits to surpluses when value added data is used to calculate China's trade balances with RCEP, Northeast Asia, and East Asia. This shift is, of course, consistent with the analysis above regarding South Korea and Taiwan, as well as the aforementioned reduction in China's deficit with ASEAN when value added data is used. The overarching point is that these partners are sending far less of their own value added to China than the data on China's gross imports would suggest.

Figure 15 shows China's trade balances in 2011, with a focus on the partners with which it had the largest trade surpluses plus a selection of partners with which it had trade deficits. (In order

to preserve some semblance of scale on the figure, China's trade surplus with the US – its largest surplus – is presented in Figure 16, which shows China's trade balances with several groupings.) Despite this paper's focus on relative changes in shares of China's exports and imports held by of various actors, as well as the shares of world exports and imports held by various actors (including China), I would be remiss in not mentioning the massive growth in the absolute size of China's trade balances – deficits and surpluses alike – from 1995 to 2011 in both gross terms and value added terms.

Whereas the rankings of China's leading trade surplus partners in 1995, as presented in Figure 13, varied minimally depending on whether gross data or value added data was used, the choice of data significantly affected the rankings in 2011. While Mexico is a particularly striking example – ranking second in gross terms but only twentieth in value added terms – the rankings differed by no fewer than five places for each of China's top ten trade surplus partners in 2011 (except for the US, which ranked first regardless of which data is used).

Although seven of China's top ten surplus partners from 1995 remained on the list in 2011, the other three partners not only fell off the list but also switched from surplus partners to deficit partners: Japan, Germany, and Hong Kong. (Hong Kong is not shown in Figure 15). Japan is a particularly interesting case, as its deficit in 2011 using gross data shifts to a surplus if value added data is used. Like the cases of South Korea and Taiwan in 1995 discussed above, the difference between China's gross imports and imports of value added from Japan was so much larger than the difference between its gross exports and exports of value added to Japan that its deficit with Japan in 2011 in gross terms shifted to a surplus in value added terms.

For similar reasons, China's deficits with partners such as Malaysia, Taiwan, and South Korea were much smaller in value added terms than gross terms in 2011. The dynamic underlying these differences can be traced, at least in part, to the nature of China's trade relations with these partners as shaped by their mutual participation in transnational manufacturing networks. Simply put, the data on China's gross imports from these partners vastly overstate the amount of each partner's value added that is actually embodied in China's imports from them. In other words, China's imports contain less of these partners' value added than gross trade data would suggest.

Figure 16 further extends the analysis to China's trade balances with various groupings in 2011. As was the case in 1995, China's trade surpluses with NAFTA and the TPP essentially mirror its trade surpluses with the United States regardless of whether gross data or value added data is used. While China's trade surplus with the EU in 2011 is slightly larger than it was in 1995 relative to its surplus with the US, the surplus with the EU is still much smaller in an absolute sense. Interestingly, China's trade balance with the BRICS shifted from a modest deficit in 1995 to a modest surplus in 2011 in both gross terms and value added terms.

Another notable development in China's trade balances between 1995 and 2011, depicted in Figure 16, was the shift from having value added surpluses with RCEP, Northeast Asia, and East Asia in 1995 (see Figure 14) to having value added deficits with these actors in 2011. Even though the deficits were much smaller in value added terms than gross terms, they were still deficits. What is striking about Figure 16, therefore, is the symmetry of the trade surpluses (in gross and value added terms alike) shown on the left side and the trade deficits (in gross and

value added terms alike) shown on the right side. By contrast, Figure 14 depicted no such clear dichotomy for 1995 – – China ran deficits in value added terms with only ASEAN and the BRICS (and very small deficits at that). Indeed, in 1995 China ran larger surpluses with RCEP, Northeast Asia, and East Asia in value added terms than it did with the EU. From a political economy perspective, China's shift to a set of trade balances characterized by a stark dichotomy between surplus partners and deficit partners, as depicted in Figure 16, is notable and potentially worthy of further examination.

Conclusion
Until recently, the data necessary to investigate the flow of value added economic activity in international trade was scarce to non-existent. The advent of the OECD-WTO TiVA database has begun to fill an important gap in this regard, allowing us to begin examining trans-national economic flows more precisely. This paper, through its initial analysis of the world's leading traders, followed by a closer examination of China's bilateral trade relations, has explored the utility of using value added trade data in conjunction with gross trade data. In particular, the paper has highlighted numerous examples of how using value added data can lead to a depiction of international trade dynamics that is quite different from what emerges when gross data is used.

Some of the most dramatic differences between value added trade flows and gross trade flows were found in China's bilateral trade balances. The use of value added data generally produces less extreme trade imbalances, in cases of surpluses and deficits alike. To be sure, large surpluses and deficits still occur but they are typically less pronounced when they are calculated based on value added trade data. In most instances, this paper found that the direction of a country's trade balance with China is the same regardless of whether gross trade data or value added trade data are used, but in certain cases a change in the data used did result in a shift from deficit to surplus or surplus to deficit.

Although the diversification of China's exports among partners around the world meant that the US's share of China exports declined from 1995 to 2011, in value added as well as gross terms, the shares of China's other leading export destinations typically declined even more. As a result, the US was more central to China's export profile in 2011 than it had been in 1995, especially in terms of its exports of value added.

At the risk of painting with too broad a brush, one finding of the paper is that the three richest economic centers in the world – Europe, North America, and Northeast Asia – are even more prominent in international trade in value added terms than they are in gross terms. On balance, actors such as the US, Japan, the EU, NAFTA, and Northeast Asia typically loom even larger in value added trade than they do in gross trade. By contrast, actors such as China, Germany, South Korea, Taiwan, Mexico, and ASEAN often loom smaller in value added terms. This observation should not be construed as denying the salience of the latter collection of actors. They are all important traders and many of them have become notably more prominent in international trade over the past two decades, in value added as well as gross terms. Yet, data on gross trade flows does tend to overstate their centrality to world trade compared to other actors.

Even as globalization proceeded apace from 1995 to 2011, the position of the EU and NAFTA in world trade relative to East Asia diminished only slightly, especially in terms of imports of value

added. Indeed, NAFTA quite remarkably increased its share of world imports of value added despite losing share in world gross imports. This is a good example of how value added data can tell a different story from gross data. Although East Asia still trails the EU and NAFTA in terms of their respective shares of world imports of value added, the gap closed significantly between 1995 and 2011. Indeed, East Asia seems poised to duplicate what happened with its exports of value added from 1995 to 2011, when it eclipsed the EU and widened its lead over NAFTA.

This paper's preliminary empirical examination of the data on gross trade flows and value added trade flows available from the OECD-WTO TiVA database suggests that expanded examination of these different sets of data is likely to yield increasingly distinct representations of China's trade with various actors, depictions that could be used as the basis for developing, even more broadly, two alternative "political economies" of China's trade relations. (Indeed, this paper just samples the kind of detailed data that can be extracted from the TiVA database.) At least initially, these perspectives might be distinguished terminologically – somewhat generically, I admit – as international political economy (IPE) and global political economy (GPE) approaches.

Before proceeding, let me emphasize that the aim in developing alternative "political economies" of China's trade relations based on gross trade data and value added trade data would be for the two approaches to complement one another as we pursue a more comprehensive understanding of China's deepening participation in world commerce and the attendant implications for geo-politics. To be sure, IPE and GPE approaches would inevitably (and not inappropriately) be seen as contending frames through which to understand and assess China's "rise." Yet I envision IPE and GPE approaches as being more complementary than competing in their ability to illuminate various aspects of China's integration into the world economy.

Despite the rising importance of GVCs in the world economy and the recent availability of value added trade data, an IPE approach retains significant utility. First, it is worth noting that not all the world's manufacturing – let alone international commerce as a whole – is conducted through GVCs. Second, although national account indicators such as gross domestic product (GDP), foreign investment flows, foreign exchange reserves, and gross trade flows cannot alone provide a complete picture of a country's role in the world economy, they are far from obsolete even in an era of significantly globalized production. For example, data on gross trade flows and balance of payments statistics shed important light on a country's financial position vis-à-vis other countries, an issue that is both politically salient and macro-economically significant.[6] Similarly, the size of a country's GDP has critical implications for its international strategic position and global influence regardless of its specialization within GVCs or the nature of its value added trade flows, as GDP profoundly shapes a country's ability not only to invest in diplomatic and military power but also to leverage its domestic market in pursuit of economic and political goals.

As I hope this paper has shown, however, an IPE approach based on traditional national account indicators such as gross trade flows is alone insufficient. A world increasingly connected through transnational production sharing requires the use of value added trade flows and other indicators that could be associated with a GPE approach, such as the share of a country's trade that reflects so-called related party transactions between corporate affiliates located in different countries. As a 2013 OECD report put it, international economic competition increasingly focuses on efforts to

capture "a larger share of value added and profits" in GVCs.[7] Consequently, it can be argued that any examination of China's evolving role in the world economy, let alone a broader assessment of its commercial, political-diplomatic, and military power in international affairs, must be informed in part by empirical analysis of Chinese participation in GVCs.

By using IPE and GPE approaches together, we can build a broader empirical basis upon which to examine general issues such as whether – and in what ways – the acceleration of transnational production sharing has transformed the nature and/or degree of economic connectedness between countries. Indeed, the World Bank's 2014 assertion that GVCs reflect a particular "type of trade and investment"[8] suggests that globalized production could represent a qualitatively different form of economic interconnectedness among countries. At a minimum, analysis exploring Keohane and Nye's distinction between "sensitivity" and "vulnerability" interdependence would seem tailor made for application to relations between China and its economic partners given the complex nature of upstream and downstream activities within GVCs.[9] This analysis, in turn, could serve as the foundation upon which we could re-examine China's ever-evolving economic interdependence with countries such as Japan and the US, an undertaking which can then inform our understanding of the wider prospects for peace, conflict resolution, and conciliation as the Pacific Century continues to unfold.

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[1] Olivier Cattaneo, Gary Gereffi and Cornelia Staritz, eds. (2010) *Global Value Chains in a Postcrisis World: A Development Perspective*, Washington, DC: World Bank, p. 7.

[2] Jeffrey Neilson, Bill Pritchard and Henry Wai-chung Yeung (2014) "Global value chains and global production networks in the changing international political economy" *Review of International Political Economy*, 21:1, p. 2.

[3] Gross trade flows distort domestic and international economic activity in several different ways. First, by counting the full value of "goods in process" each time they cross national borders while traversing GVCs, gross trade flow data (that is, nominal imports and exports) considerably overstate the significance of international trade to world economic activity. Second, by ignoring the upstream perspective – namely, that Country B's exports to Country C may include foreign value added from Country A (through Country B's imports of inputs from Country A) – gross trade flow data effectively exaggerates the importance of Country's B exports to its own economy. After all, the share of country B's exports that reflects economic activity from Country A does not contribute to its own GDP. Third, by ignoring the downstream perspective – namely, that value added from Country A is embodied in Country B's exports to Country C – gross trade flow data obscures the fact that Country C is the destination of final consumption for some of Country A's value added.

[4] The database is available at
https://stats.oecd.org/Index.aspx?DataSetCode=TIVA2015_C1

[5] The fact that Northeast Asia experienced larger gains between 1995 and 2011 than East Asia may suggest that much of the increase in the former's share of world gross imports and world imports of value added reflected increased trade with ASEAN.

[6] UNCTAD (2015), *Tracing the Value-added in Global Value Chains: Product-level Case Studies in China*, p. v.

[7] OECD (2013), *Interconnected Economies: Benefiting from Global Value Chains*, OECD Publishing. http://dx.doi.org/10.1787/9789264189560-en, p. 41.

[8] Daria Taglioni and Deborah Winkler, "Making Global Value Chains Work for Development" *Economic Premise* No. 143 (World Bank, May 2014), p. 1

[9] For the original discussion of sensitivity vs. vulnerability, see Robert O. Keohane and Joseph S. Nye, *Power and Interdependence: World Politics in Transition* (Little, Brown 1977)

Figure 1
Country Share (in %) and Rank (#) of World Gross Exports and Exports of Value Added, 1995 and 2011
**(countries are shown, from left to right, from first to tenth in gross exports for 1995)**

gross exports 1995 ■ exports of value added 1995 ■ gross exports 2011 ■ exports of value added 2011
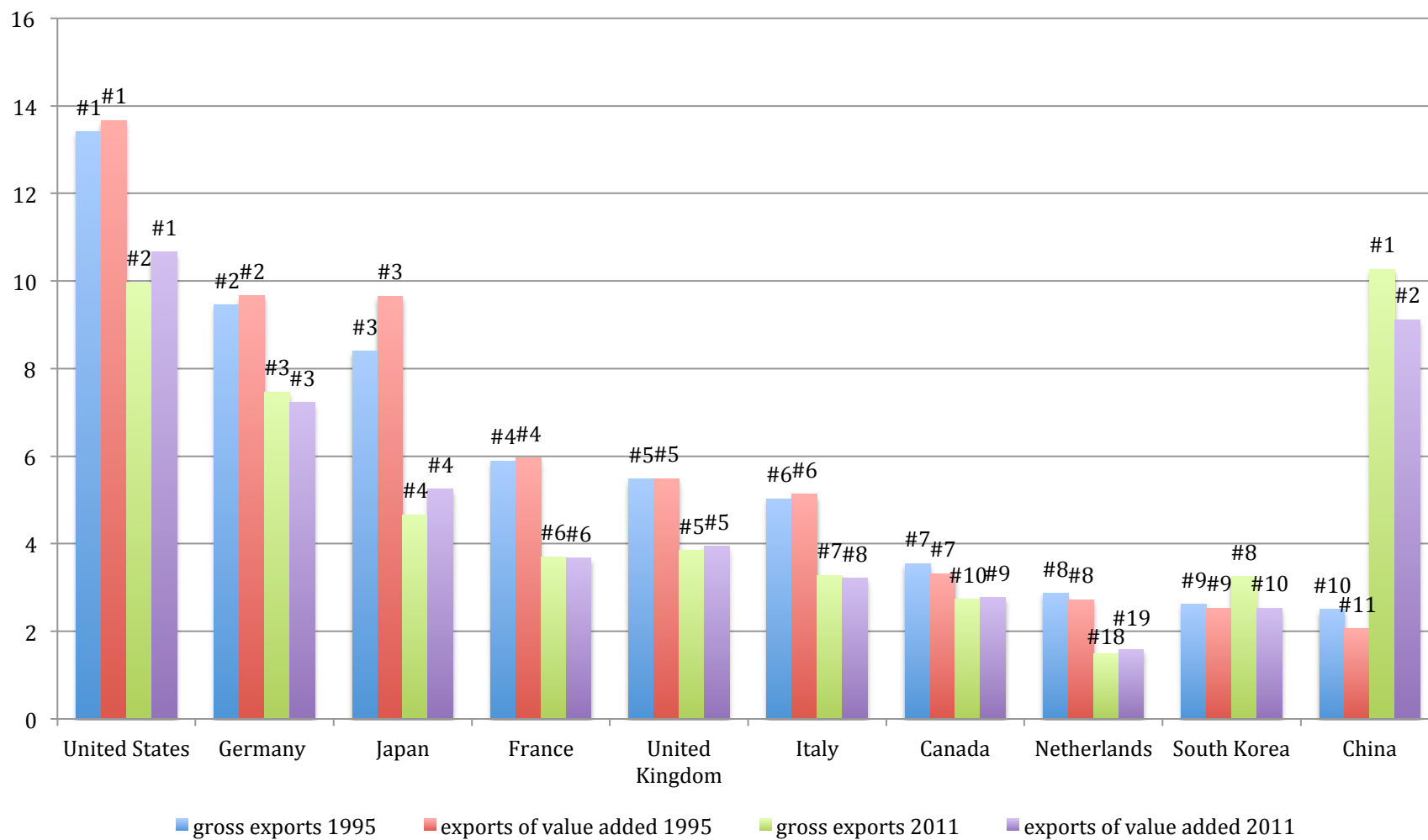
Figure 2
Actor Share (in %) of World Gross Exports and Exports of Value Added, 1995 and 2011
(countries are shown, from left to right, from higher to lower rank [#] in gross exports for 1995)
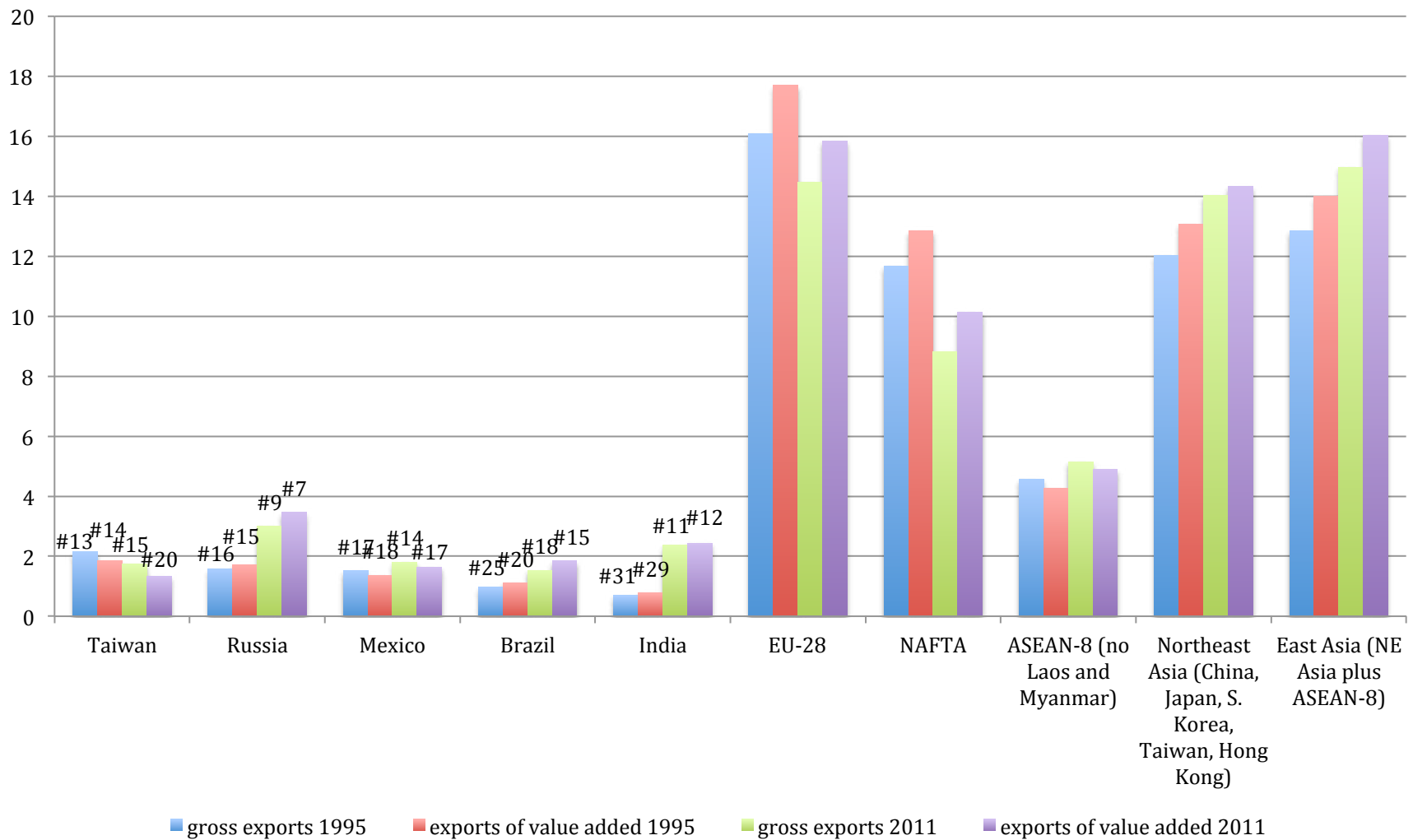
Figure 3
Country Share (in %) and Rank (#) of World Gross Imports and Imports of Value Added, 1995 and 2011
(countries shown are, from left to right, the top eight in gross imports for 1995 plus China)

gross imports 1995 ■ imports of value added 1995 ■ gross imports 2011 ■ imports of value added 2011 ■
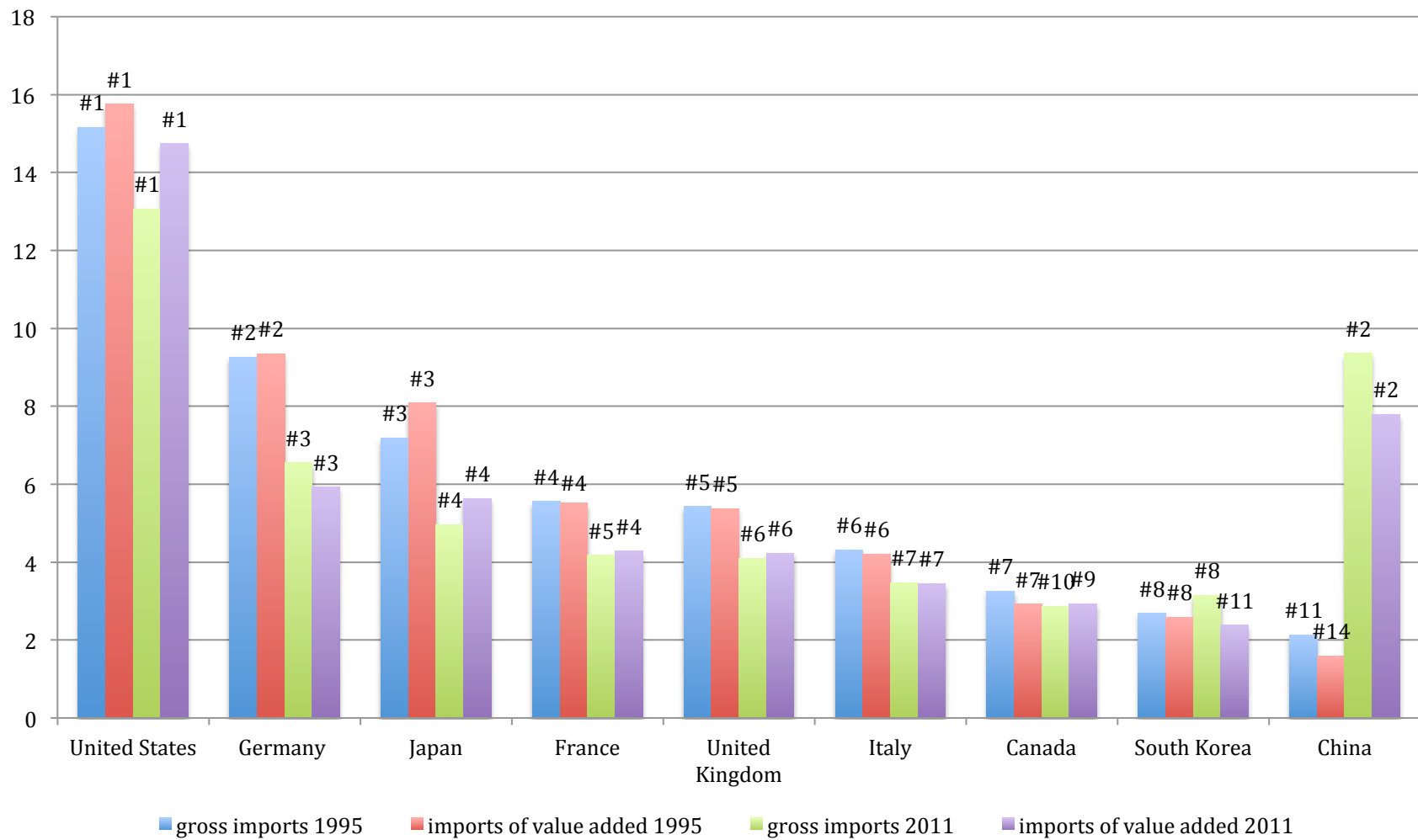
Figure 4
Actor Share (in %) of World Gross Imports and Imports of Value Added, 1995 and 2011
(countries are shown, from left to right, from higher to lower rank [#] in gross imports for 1995

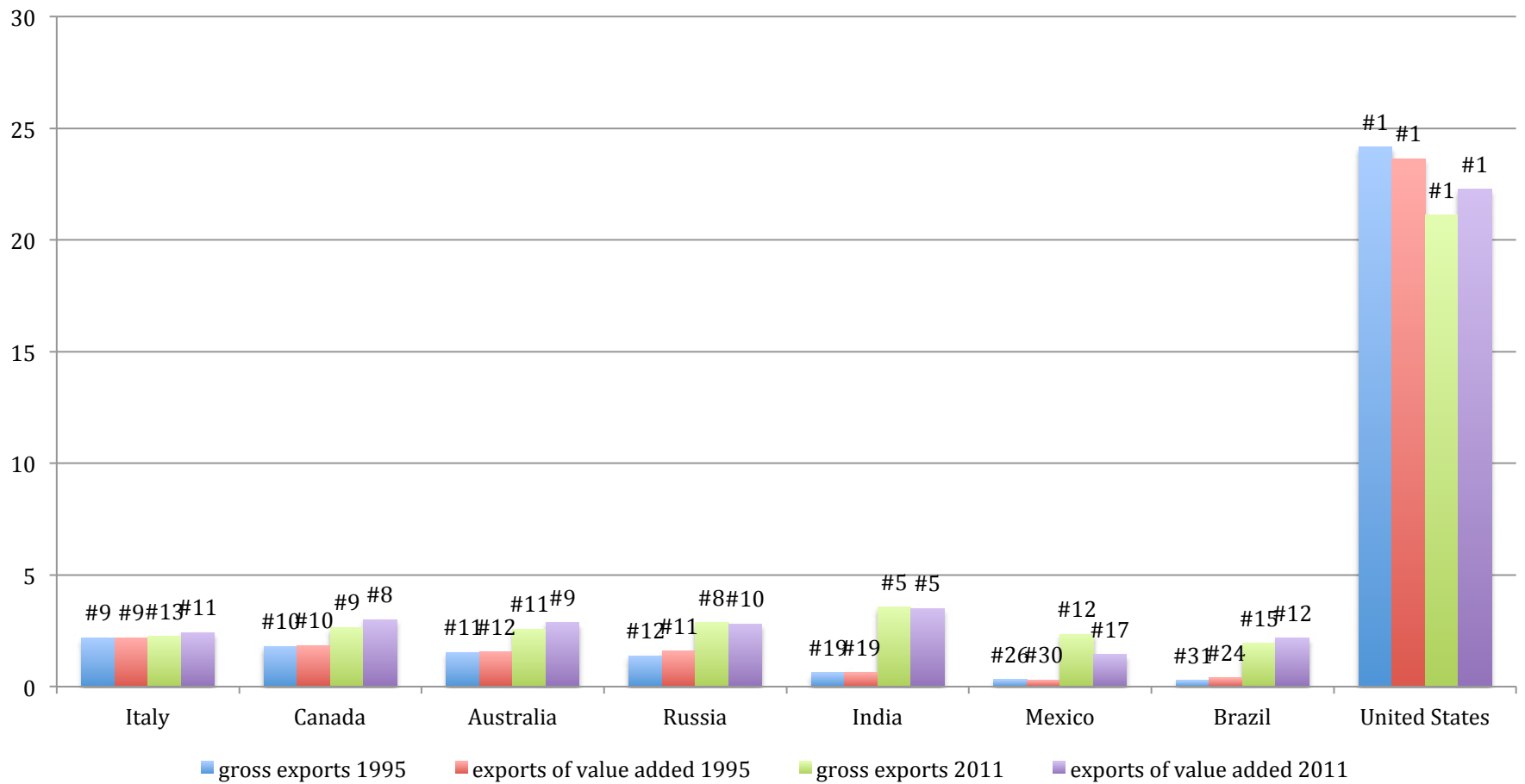gross imports 1995 ■ imports of value added 1995 ■ gross imports 2011 ■ imports of value added 2011
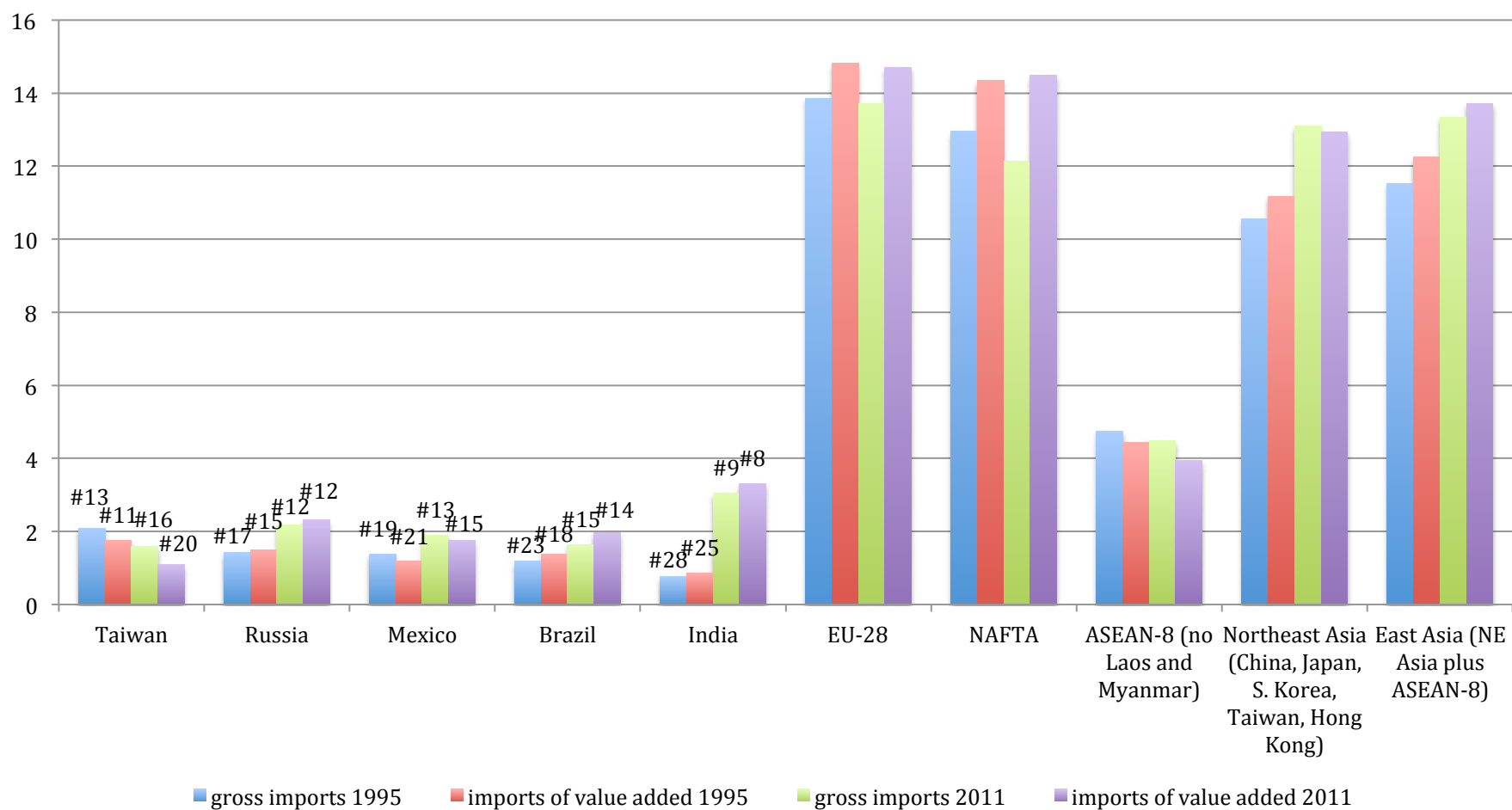
Figure 5
Share (in %) and Ranking (#) in China's Gross Exports and Exports of Value Added, 1995 and 2011
(partners shown are, from left to right, the top eight destinations for China's gross exports in 1995)

gross exports 1995　　exports of value added 1995　　gross exports 2011　　exports of value added 2011
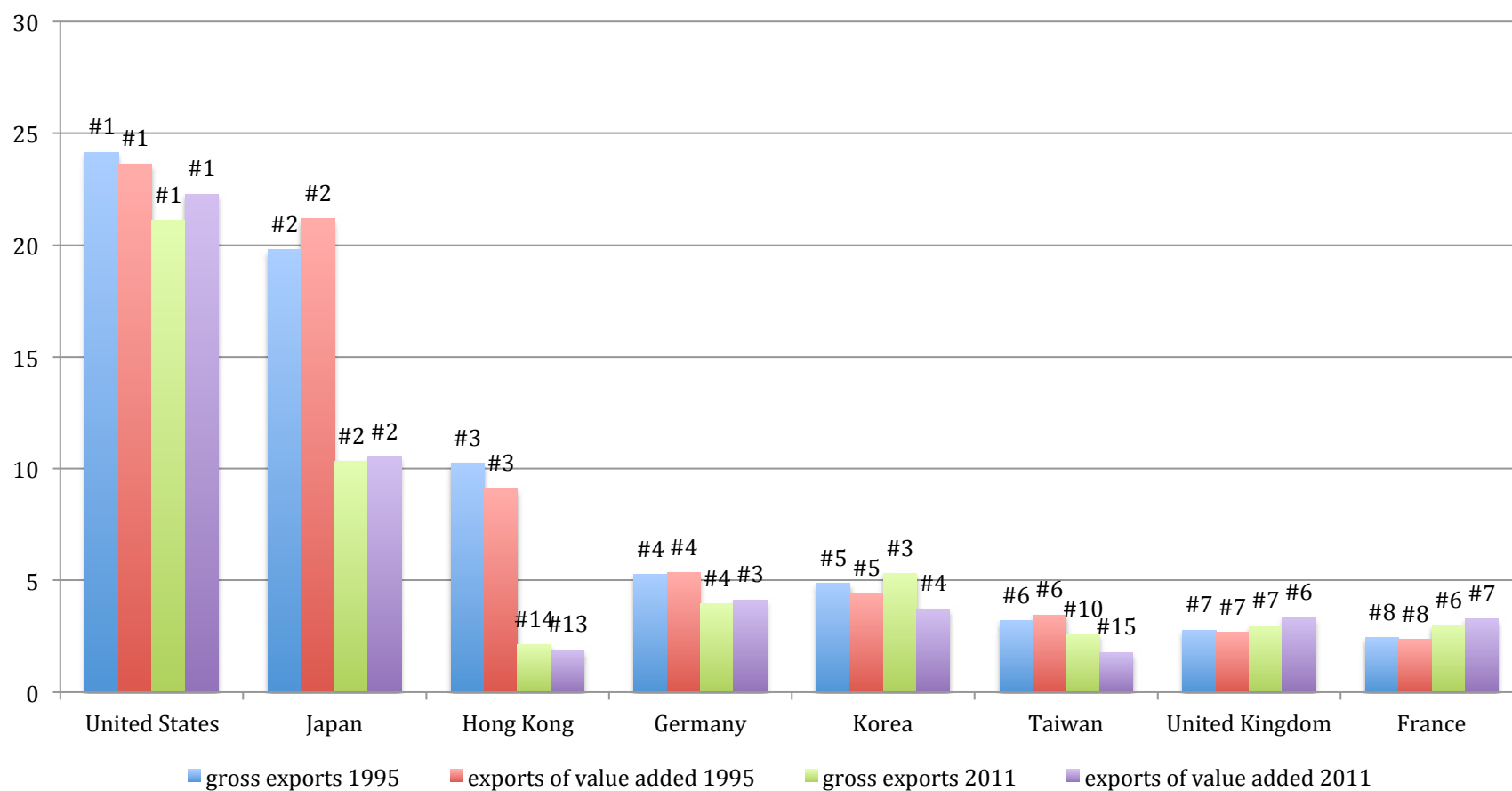
Figure 6
Share (in %) and Ranking (#) in China's Gross Exports and Exports of Value Added, 1995 and 2011
(partners shown were ninth through twelfth among the top 12 destinations for China's gross exports in 1995 plus selected other partners)
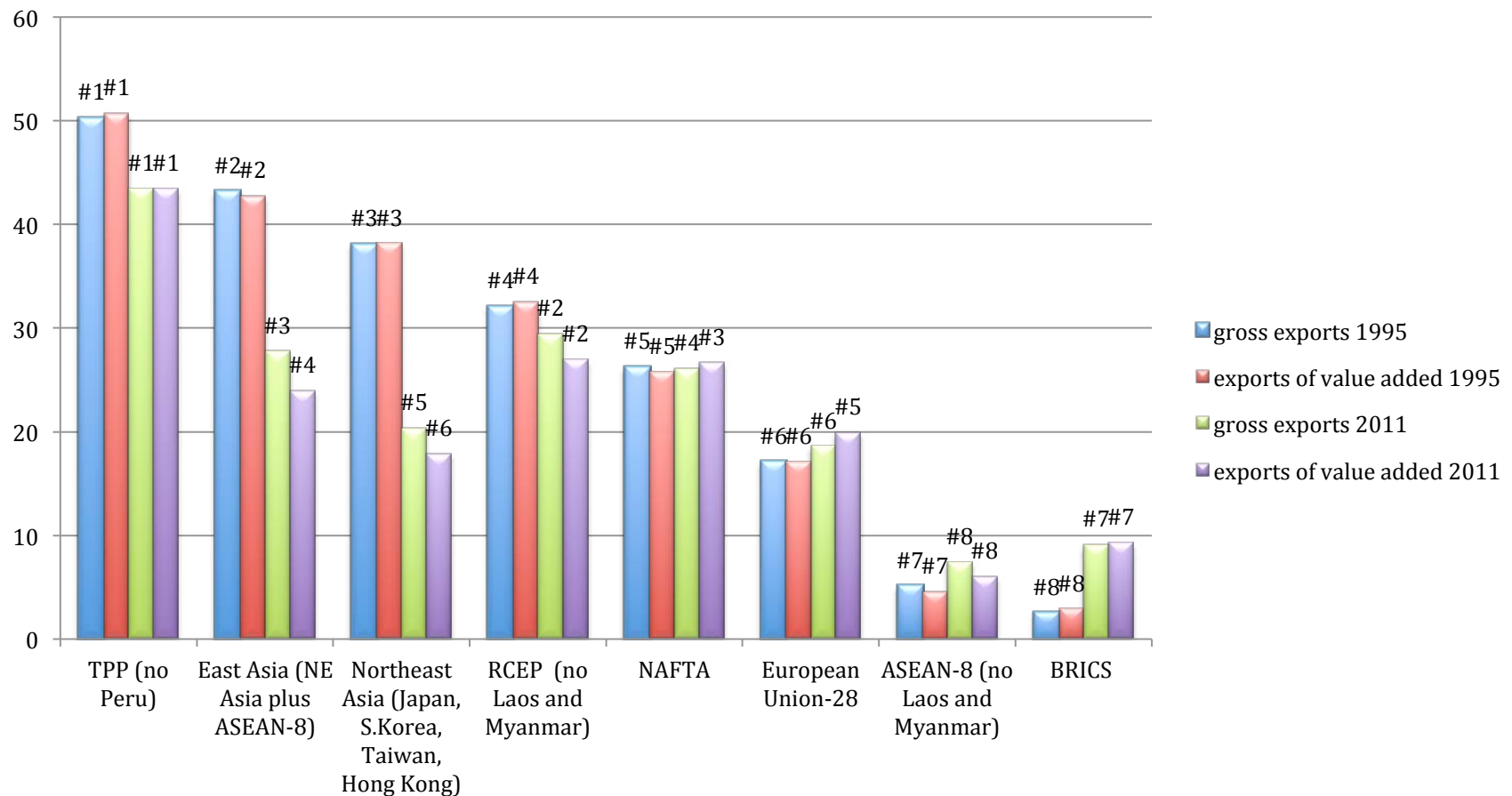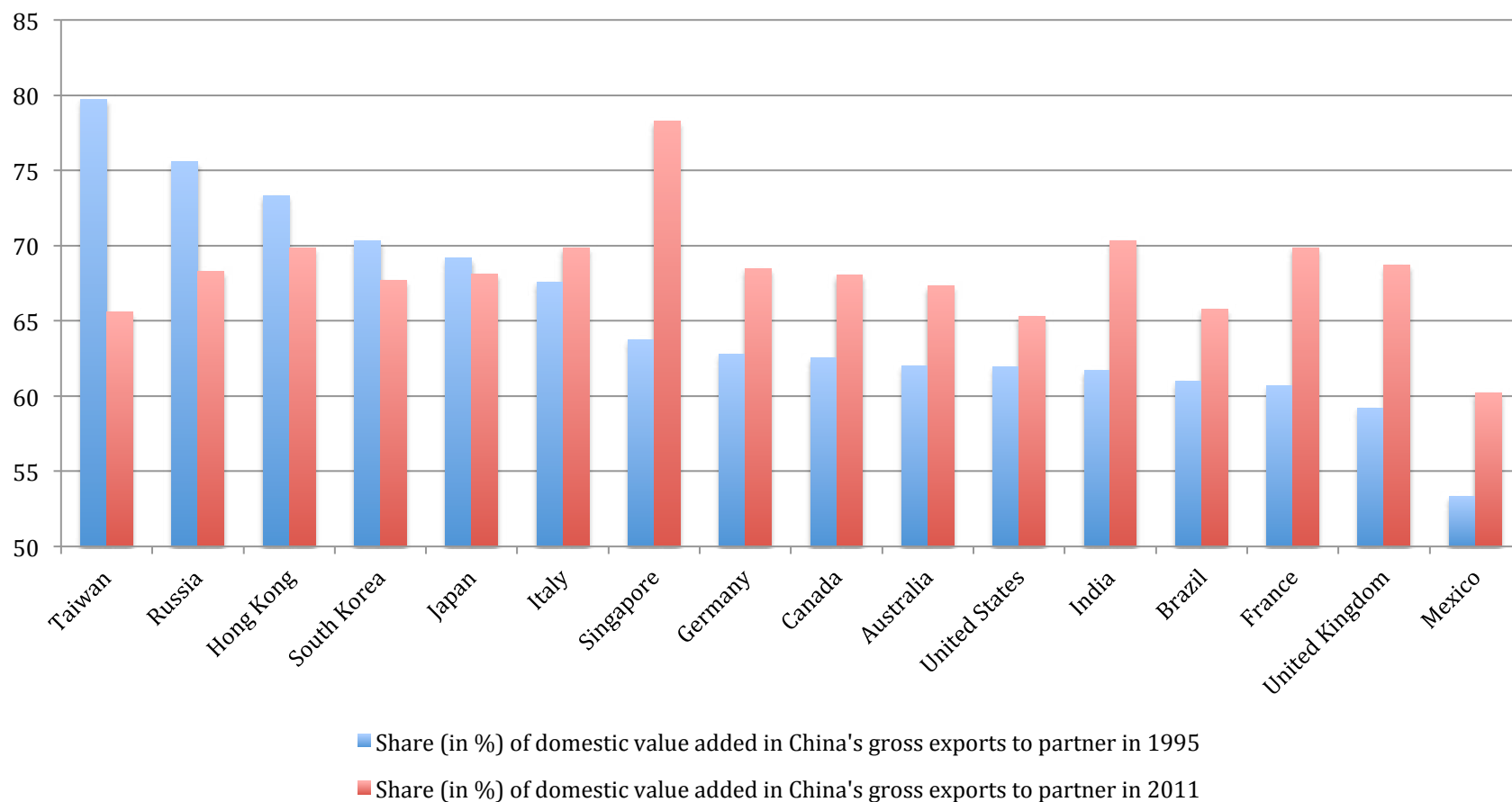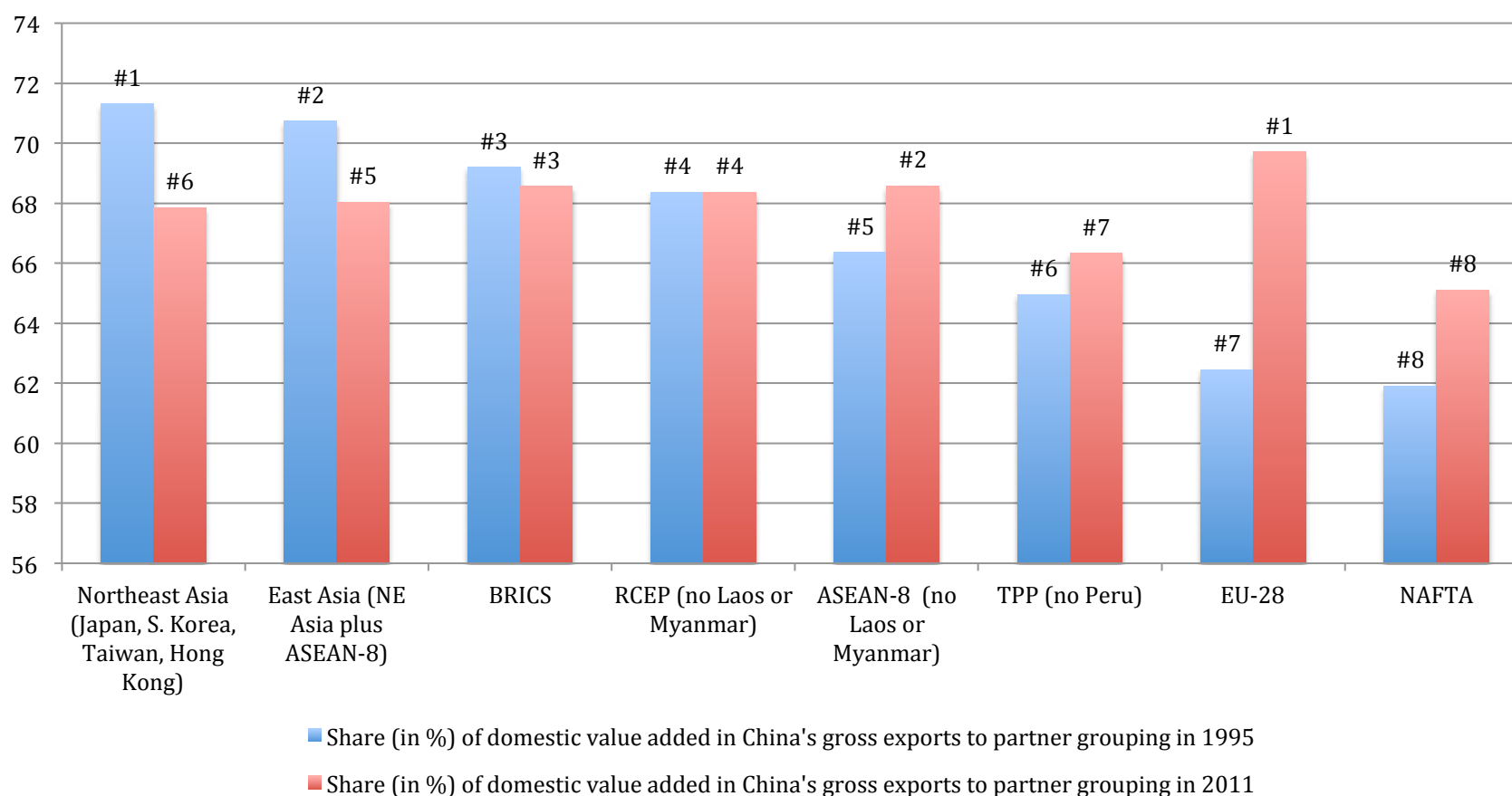
Figure 7
Grouping Share (in %) and Grouping Ranking (#) in China's Gross Exports and Exports of Value Added, 1995 and 2011
(groupings are ordered, from left to right, from larger to smaller destinations for China's gross exports in 1995)

Figure 8
Share (in %) of Domestic Value Added in China's Gross Exports to Selected Partners, 1995 and 2011
(partners are shown from left to right in descending order of DVA as a % of China's gross exports, 1995)

■ Share (in %) of domestic value added in China's gross exports to partner in 1995

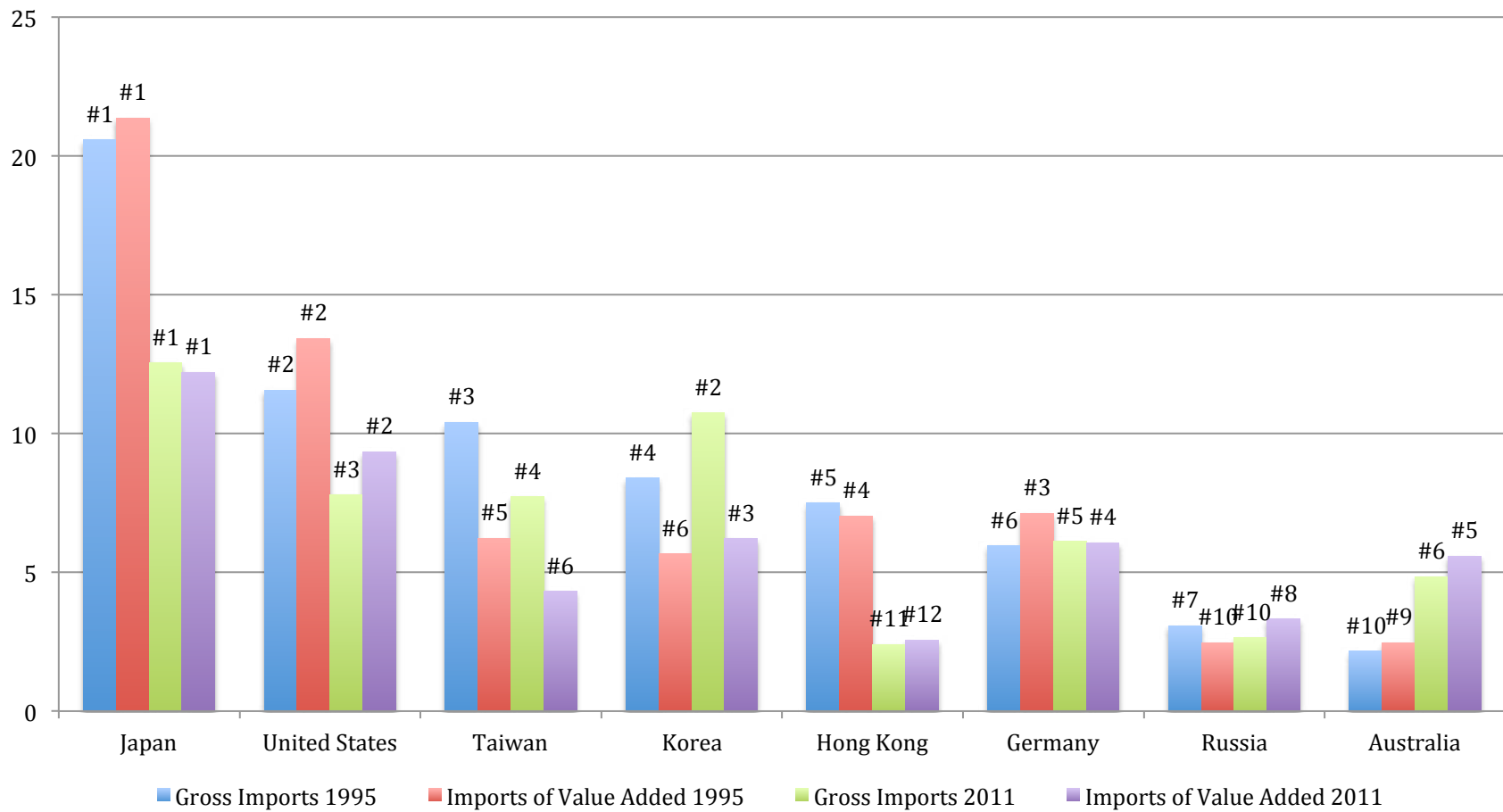■ Share (in %) of domestic value added in China's gross exports to partner in 2011

Figure 9
Share (in %) of Domestic Value Added in China's Gross Exports to Selected Groupings, 1995 and 2011
(groupings are shown from left to right in descending order of DVA as a % of China's gross exports in 1995

■ Share (in %) of domestic value added in China's gross exports to partner grouping in 1995

■ Share (in %) of domestic value added in China's gross exports to partner grouping in 2011

Figure 10
Share (in %) and Ranking (#) in China's Gross Imports and Imports of Value Added, 1995 and 2011
(partners shown were among China's top ten sources of gross imports in both 1995 and 2011)

Legend: Gross Imports 1995 ■ Imports of Value Added 1995 ■ Gross Imports 2011 ■ Imports of Value Added 2011

Figure 11
Share (in %) and Ranking (#) in China's Gross Imports and Imports of Value Added, 1995 and 2011
(six partners shown were among China's top ten sources of gross imports or imports of value added in either 1995 or 2011, plus India)

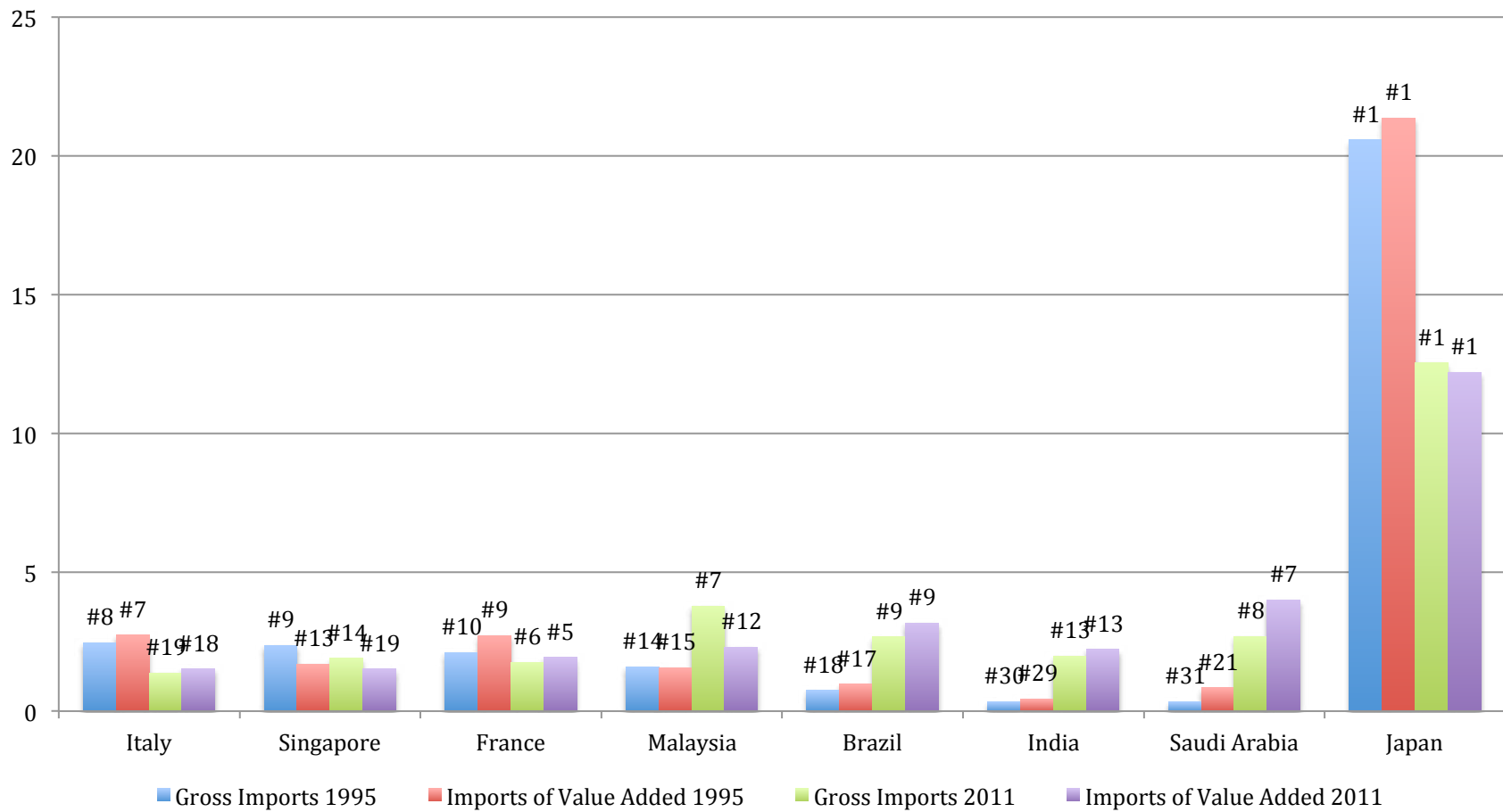■ Gross Imports 1995　■ Imports of Value Added 1995　■ Gross Imports 2011　■ Imports of Value Added 2011
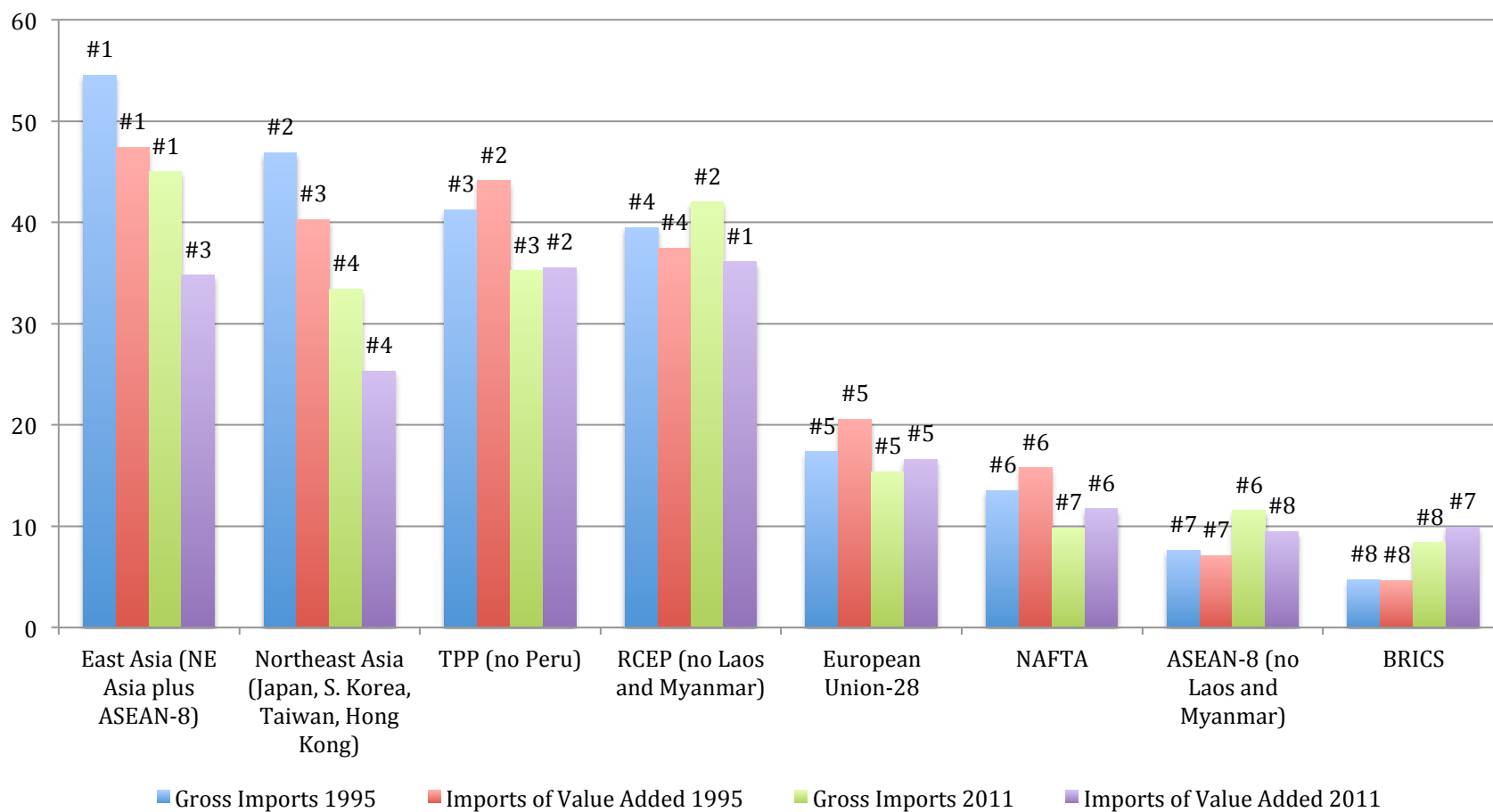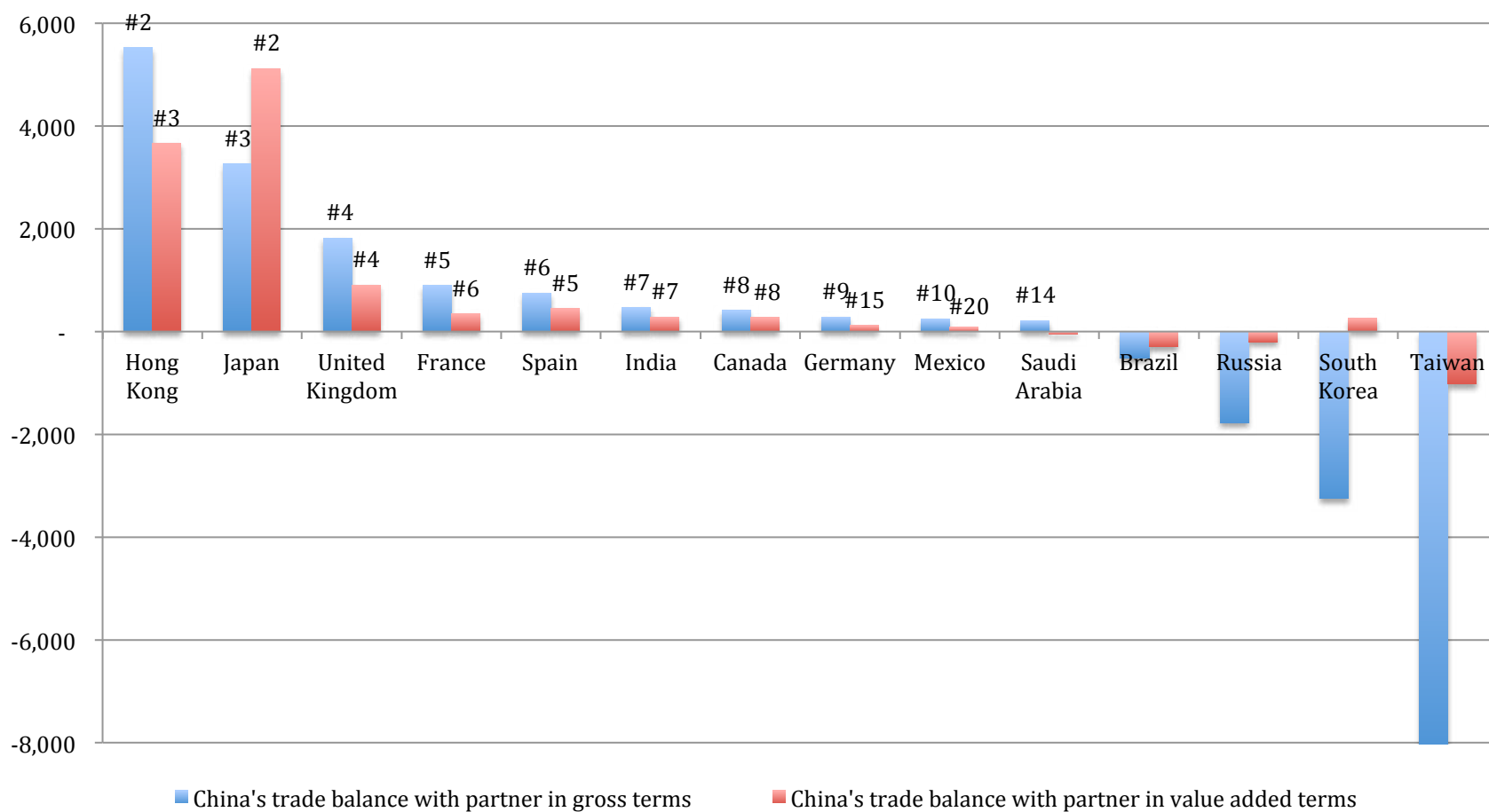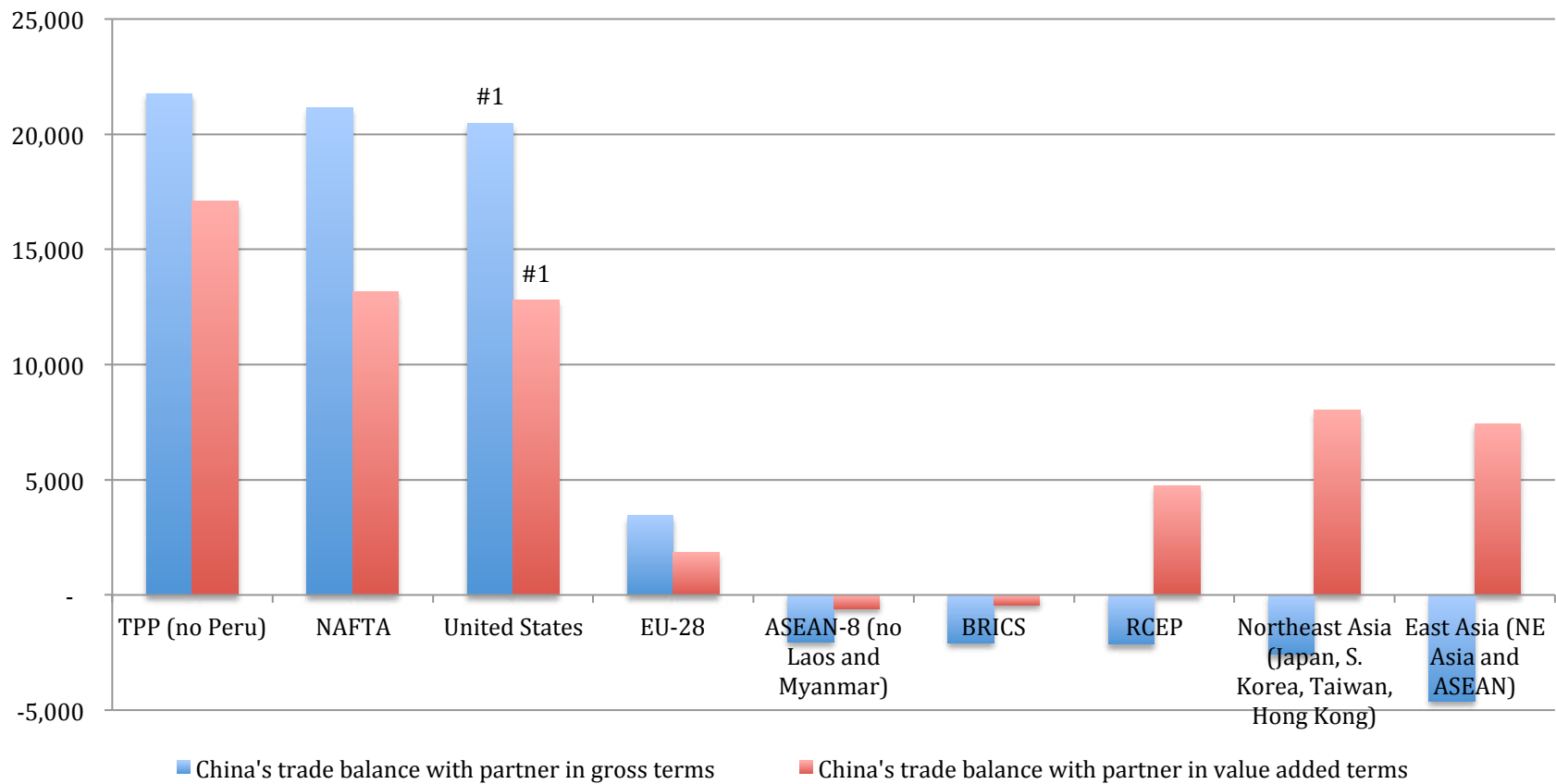
Figure 12
Grouping Share (in %) and Grouping Ranking (#) in China's Gross Imports and Imports of Value Added, 1995 and 2011
(groupings are ordered, from left to right, from larger to smaller sources of China's gross imports in 1995)
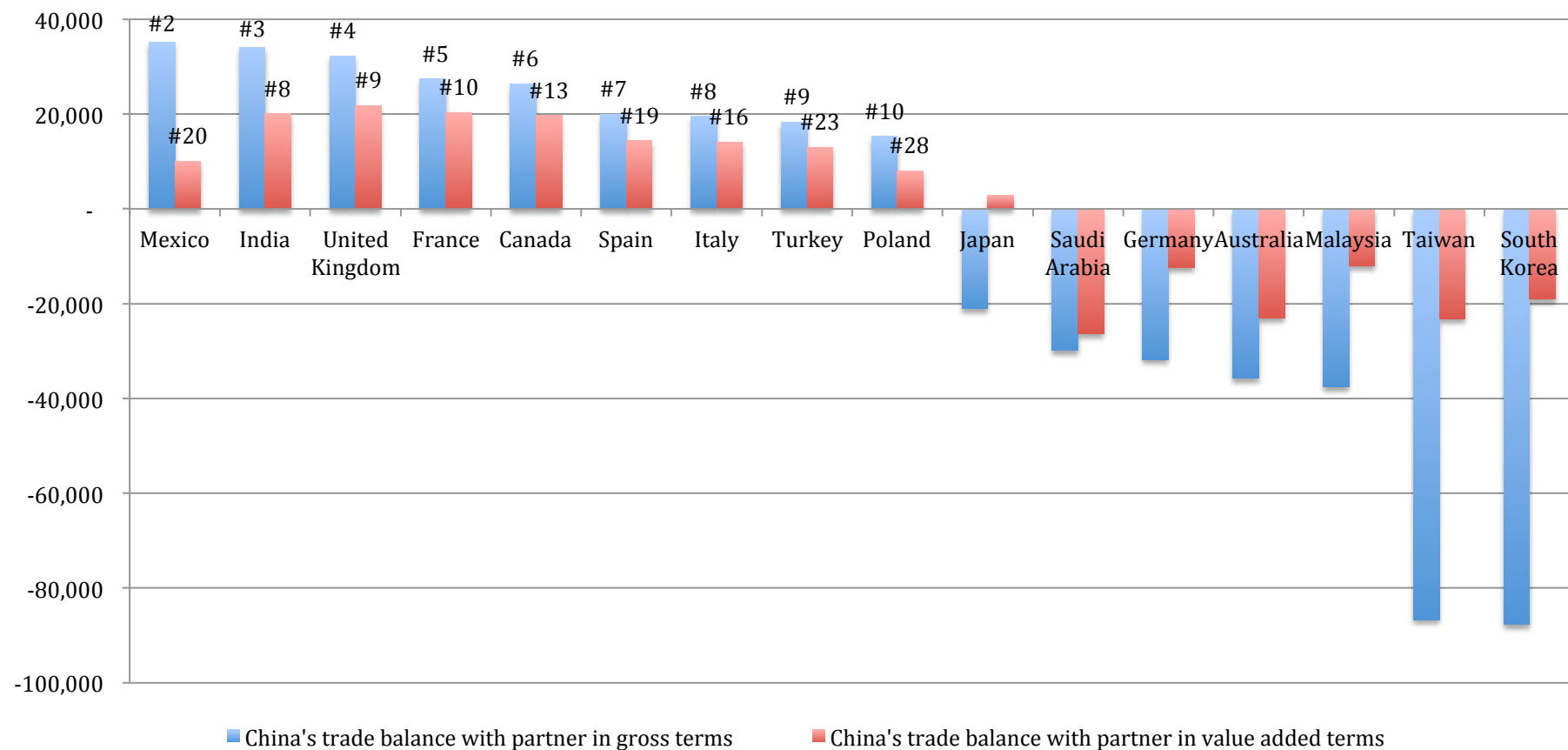
Figure 13
China's Trade Balance (in US$ Millions) with Selected Partners in Gross and Value Added Terms, 1995
(partner #2 through #10 of China's largest trade surpluses plus selected trade deficits)
(to preserve scale, #1 US is presented with groupings)

China's trade balance with partner in gross terms   China's trade balance with partner in value added terms

Figure 14
China's Trade Balance (in US$ millions) with Key Partners in Gross and Value Added Terms, 1995
(to preserve scale, #1 ranked US is presented here with groupings rather than with countries)

■ China's trade balance with partner in gross terms   ■ China's trade balance with partner in value added terms

Figure 15
China's Trade Balance (in US$ Millions) with Selected Partners in Gross and Value Added Terms, 2011
(partner #2 through #10 of China's largest trade surpluses plus selected trade deficits)
(to preserve scale, #1 US is presented with groupings)

■ China's trade balance with partner in gross terms   ■ China's trade balance with partner in value added terms

Figure 16
China's Trade Balance (in US$ millions) with Key Partners in Gross and Value Added Terms, 2011
(to preserve scale, #1 ranked US is presented here with groupings rather than with countries)

- China's trade balance with partner in gross terms
- China's trade balance with partner in value added terms