

Economic Relations between China and the U.S.

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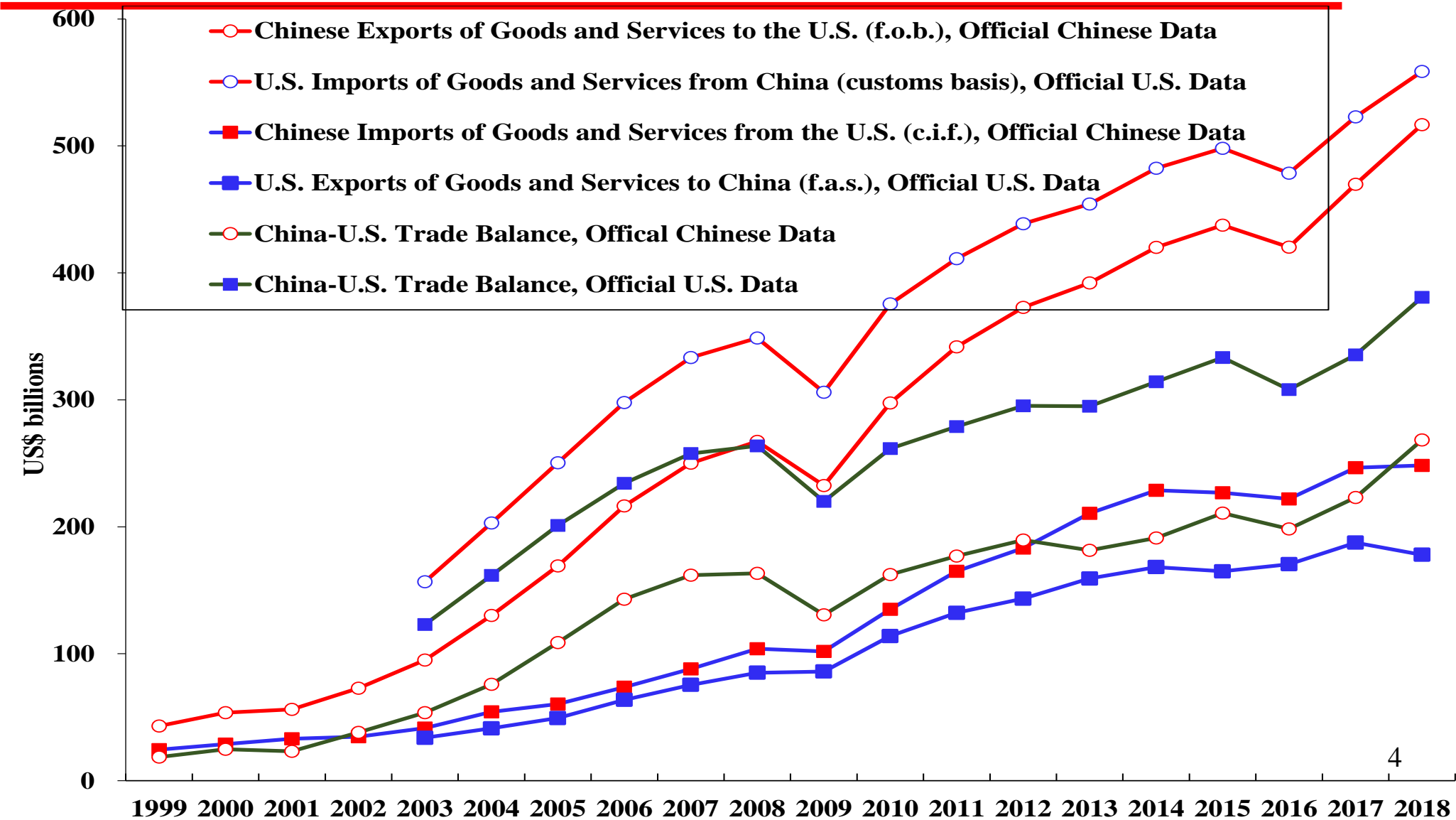
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Introduction

- ◆ The large and chronic China-U.S. bilateral trade surplus is the proximate cause of the current China-U.S. trade war, but there are other underlying economic and geo-political causes as well.
- ◆ However, the two countries do not even agree on the size of the bilateral trade surplus. We shall begin by showing that the China-U.S. trade surplus, correctly measured, is not as large as it is made out to be, but is nevertheless still a large number.
- ◆ We then show that the gross value of the bilateral trade surplus does not reflect the relative benefits of the bilateral trade to the two trading-partner countries. Instead, we should look at the value-added (GDP) and employment generated directly and indirectly by the bilateral trade.
- ◆ In terms of both direct, indirect and total value-added generated by the exports of goods to each other, the China-U.S. bilateral gap is much smaller than that measured in terms of gross value of exports, and it is feasible to close the gap with coordinated expansion of trade between the two economies.

The Different Measurements of the Bilateral Trade Balance



Introduction

- ◆ We then analyse the real impacts of the mutual tariffs on the two economies. When two countries trade, they both benefit in the aggregate because their choice sets are enlarged. Thus economic welfare must rise in both countries. Thus a country always loses when it restricts its own choice set. Its aggregate welfare will decline. But their trading-partner country will also lose.
- ◆ However, it is also inevitable that there will be economic and technological competition between China and the U.S., the two largest economy in the world.
- ◆ We identify the economic complementarities between China and the U.S. The potential benefits from bilateral trade are higher when the two economies are more different.
- ◆ We then discuss the possibility of coordinated expansion of trade that can be win-win for both countries.
- ◆ Finally, we consider how mutual economic interdependence may be enhanced.
- ◆ Brief concluding remarks are made at the end.

The Different Measurements of the Bilateral Trade Balance

- ◆ In 2018, despite the trade war and the slight devaluation of the Renminbi, Chinese exports of goods to the U.S. actually increased by 11.3%, in part because of the acceleration of exports in anticipation of the imposition and increases of tariffs. U.S. exports to China has actually declined by 7.3%, reflecting the Chinese tariffs on U.S. agricultural commodities as well as U.S. restrictions on high-technology exports.
- ◆ The official U.S. estimate of the U.S.-China trade deficit in goods only in 2018 is US\$419.6 billion, an increase from US\$375.8 billion in 2017. The official Chinese estimate of the bilateral trade surplus is US\$323.3 billion, an increase from US\$275.8 billion. There is a difference of almost US\$100 billion.
- ◆ However, these numbers suffer from a number of imperfections and are not directly comparable.

The Different Measurements of the Bilateral Trade Balance

- ◆ First, exports of goods are measured by the exporting country as either f.o.b. (free on board) or f.a.s. (free alongside ship), and imports of goods as c.i.f. (cost, insurance and freight) or customs basis, so that the measured imports of the importing country is always larger than the measured exports of the exporting country. Even if the exports of both countries to each other are exactly the same, they will both show a bilateral trade deficit. There is therefore a built-in bias for a bilateral deficit with the conventional measurements of exports and imports.
- ◆ Moreover, insurance and freight are frequently provided by firms of third countries and should not be attributed to the exporting country.
- ◆ It is therefore more accurate to measure the bilateral trade surplus using only bilateral data on exports, f.o.b.
- ◆ If the bilateral trade deficit is calculated based on bilateral exports data only, f.o.b., the China-U.S. bilateral trade surplus in 2018 would be US\$356.4 billion, smaller than the official U.S. estimate of US\$419.6 billion and larger than the official Chinese estimate of US\$323.3 billion.

The Different Measurements of the Bilateral Trade Balance

- ◆ Second, the official trade data do not necessarily include re-exports via third countries and customs territories such as Hong Kong. This applies to both re-exports of Chinese goods to the U.S. and re-exports of U.S. goods to China through Hong Kong and other non-Chinese and non-U.S. ports.
- ◆ The U.S. trade statistics classify re-exports of Chinese goods through third countries and regions as imports from China, quite properly so. However, they do not include re-exports of U.S. goods to China through third countries and regions as U.S. origin. Similarly, the Chinese trade statistics do not include re-exports of Chinese goods to the U.S. through third countries or regions but appear to include re-exports of U.S. goods to China.
- ◆ We estimate the extent of re-exports by comparing the imports data of each country with the exports data of the other, taking into account the value of insurance and freight. We find that in recent years, the measured imports of a country, minus a generous allowance for insurance and freight, almost always exceed the corresponding measured exports from the other country. Their difference provides an estimate of the value of re-exports. (The re-exports thus estimated may be under-estimated as there may be an incentive for importers to under-invoice imports in order to avoid or reduce tariffs. These estimates are compared to re-exports data of Hong Kong and are broadly consistent in recent years.
- ◆ If the estimated bilateral re-exports of goods are added to the exports on an f.o.b. basis, the bilateral trade deficit may be estimated to be US\$350.9 billion compared with US\$356.4 billion not including the re-exports. Re-exports are no longer an important factor in China-U.S. bilateral trade as they were at one time.

The Different Measurements of the Bilateral Trade Balance

- ◆ Third, the bilateral trade data often do not include trade in services, in which the U.S. has a significant surplus estimated to be US\$38.8 billion in 2018 by the U.S. and US\$54 billion by China for 2017 (Chinese data for 2018 apparently have not been released).
- ◆ If the bilateral trade deficit is calculated for goods and services combined, the official U.S estimate of the China-U.S. bilateral trade surplus is US\$380.8 billion, smaller than the official U.S. estimate of US\$419.6 billion; the official Chinese estimate of the China-U.S. bilateral trade surplus is US\$268.4 billion and smaller than the official Chinese estimate of US\$323.3 billion. (The Chinese service trade figures for 2018 are estimated by the author. They are assumed to have grown at the same rate as the official U.S. data.)
- ◆ However, there exist large differences between the official Chinese and U.S. estimates of the exports of services to and imports of services from each other.

The Different Measurements of the Bilateral Trade Balance

- ◆ We make two alternative calculations involving trade in services. First, we use official U.S. estimates of the bilateral trade flows in services. The resulting estimate of the U.S.-China overall trade deficit in goods, including re-exports, and services combined in 2018 may be estimated as US\$312.1 billion.
- ◆ Second, we use the reported service imports data of the importing country, on the grounds that they are more reliable than the service exports data. The resulting estimate of the U.S.-China overall trade deficit may be estimated as US\$276.0 billion.
- ◆ These are still large numbers, but smaller than the often-mentioned U.S. official estimate of the bilateral trade deficit in goods only of US\$419.6 billion by between one-quarter and one-third, and even smaller than the Chinese official estimate of US\$323.3 billion for goods only.

The Different Measurements of the Bilateral Trade Balance: A Summary

Summary of Different Measurements of the China-U.S. Trade Balance

Measurement	Official Chinese Estimates	Our Estimates	Official U.S. Estimates
Goods Only (FOB-CIF)	323.3		419.6
Goods Only FOB		356.4	
Goods and Services	268.4		380.8
Goods, including Re-Exports, FOB		350.9	
Goods, including Re-Exports, FOB, and Services (U.S. Data)		312.1	
Goods, including Re-Exports, FOB, and Services (Imports)		276.0	11

The Relative Benefits from the Bilateral Trade

- ◆ However, the gross value of exports does not reflect accurately the real benefits of exports to the exporting country. What really matters is the GDP created by the exports, that is, the domestic value-added generated by the exports, directly and indirectly. (The employment and GNP generated by the exports are also important.)
- ◆ As an example, consider the Apple iPhone, an export of China since it is finally assembled by Foxconn (Hon Hai Precision Industry Co., Ltd. of Taiwan) in China. The value of an iPhone is at least US\$600 whereas the Chinese domestic value-added is less than US\$20, with a direct value-added content of 3.3%. (The GNP generated is even lower since Foxconn is not a Chinese company.)

The Relative Benefits from the Bilateral Trade

- ◆ The average direct domestic value-added content of Chinese exports of goods to the U.S. is less than 25%. So that US\$100 billion worth of Chinese exports to the U.S., f.o.b., generates directly US\$25 billion of Chinese GDP.
- ◆ However, the reduction of exports leads to a reduction in the demands for domestic inputs used in their production, which in turn lead to a second-round reduction in the demands for domestic inputs used in the production of the domestic inputs.
- ◆ With the indirect, that is, second-, third-, fourth- and higher-round effects of the reduction of Chinese exports kicking in, the total domestic value-added affected will eventually increase to 66% cumulatively, with the indirect value-added content being 41%.

The Relative Benefits from the Bilateral Trade

- ◆ The average direct domestic value-added content of U.S. exports of goods to China may be estimated to be 50.8%. Including all the indirect, that is, second-, third-, fourth- and higher-round effects of the reduction of U.S. exports of goods, the total domestic value-added affected increases to 88.7% cumulatively, with the indirect value-added content being 37.9%.
- ◆ Using these estimates of the domestic value-added contents of Chinese and U.S. exports of goods to each other, the U.S.-China trade deficit in goods and services combined in terms of total value-added may be estimated as US\$161 billion in 2018, less than 40 percent of the often-mentioned U.S.-China trade deficit in goods only of US\$419.6 billion. (The value-added content of exports of services is taken to be 100%.)
- ◆ This value-added deficit can be closed with an increase in U.S. exports of goods to China of a gross value of US\$181 billion (based on an average value-added content of 88.7%), which is feasible within a few years as discussed below.
- ◆ We also note that this figure is based on the official U.S. estimate of its exports of services to China of US\$57.2 billion in 2018. The Chinese estimate of U.S. exports of services to China is approximately US\$93 billion in 2018, which would reduce the value-added gap to approximately US\$125 billion.

The Relative Benefits from the Bilateral Trade in Terms of Value-Added: A Summary

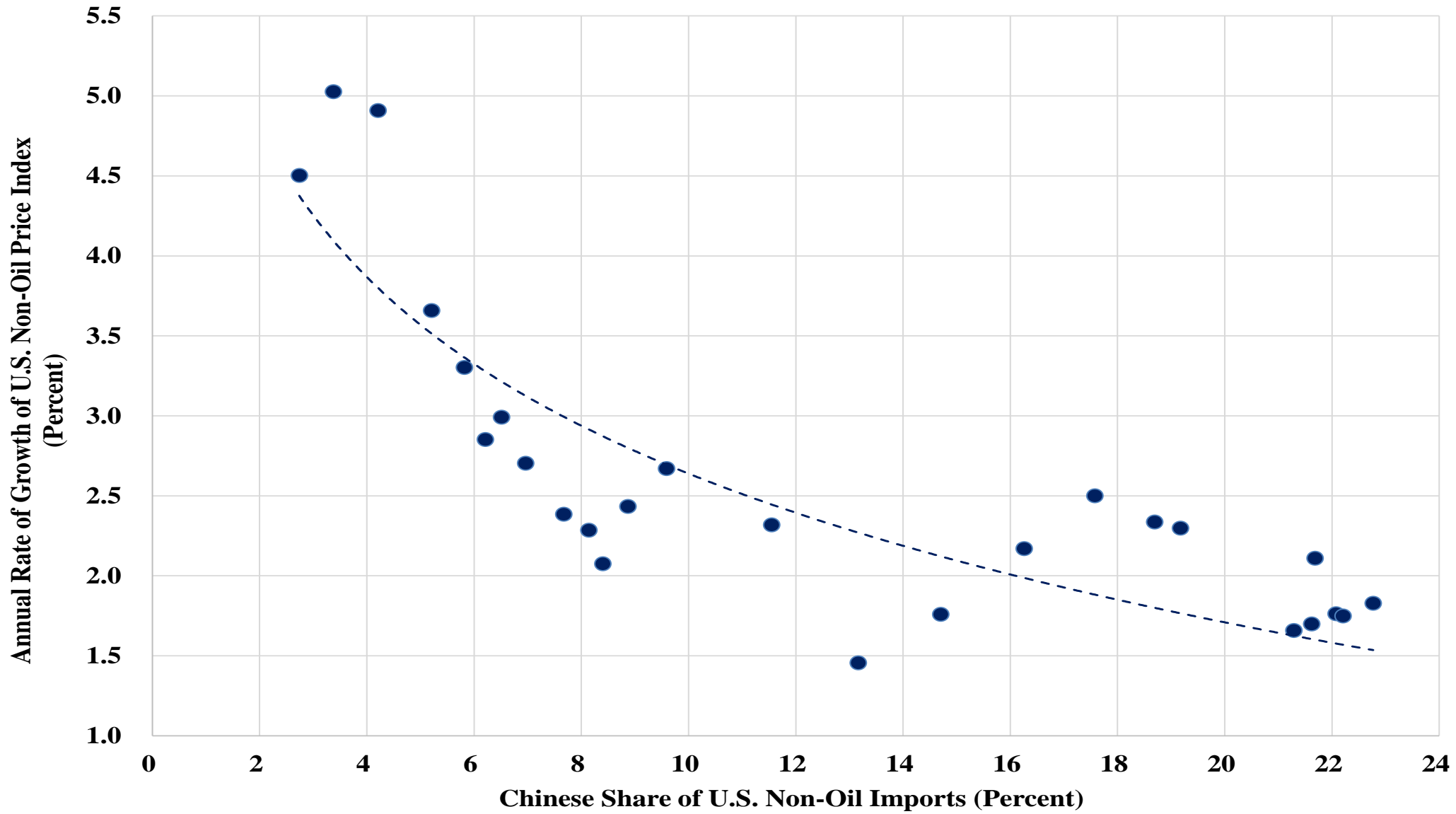
Summary of Comparisons of Relative Benefits

Measurement	China	The U.S.	Difference
Direct Value-Add	159.8	128.6	31.2
Indirect Value-Added	240.2	110.5	129.8
Total Value-Added	400.0	239.1	161.0

The Relative Benefits from the Bilateral Trade

- ◆ It is difficult to assess whether China or the U.S. has benefitted more from their economic relations. China has been able to lift 740 million of its citizens out of poverty, initially through the vast expansion of export-oriented jobs in China that result from China's opening up to international trade and direct investment and accession to the World Trade Organisation (WTO).
- ◆ However, the U.S. consumers have benefitted from two decades of low prices for their consumer goods. Had U.S. imports from China stayed at 1994 levels, the U.S. Consumer Price Index would have been 27 percent higher in 2017, or approximately 1 percentage point higher annually (see the following chart).
- ◆ Additional benefits for the U.S. include the profits of U.S. corporations earned by their operations within China, such as General Motors, Walmart and Starbucks, as well as the sales of Apple i-phones, which since they are finally assembled within China, are not considered U.S. exports to China. Moreover, royalties and license fees paid to subsidiaries of U.S. firms in third-country tax havens such as Ireland and the Netherlands are also not included as income earned by U.S. nationals from China.
- ◆ Also not included are the benefits that the U.S. has derived from seigniorage, that is, from being the monopolist provider of the international medium of exchange for Chinese international transactions. China is the largest foreign holder of U.S. government bonds and agency securities.

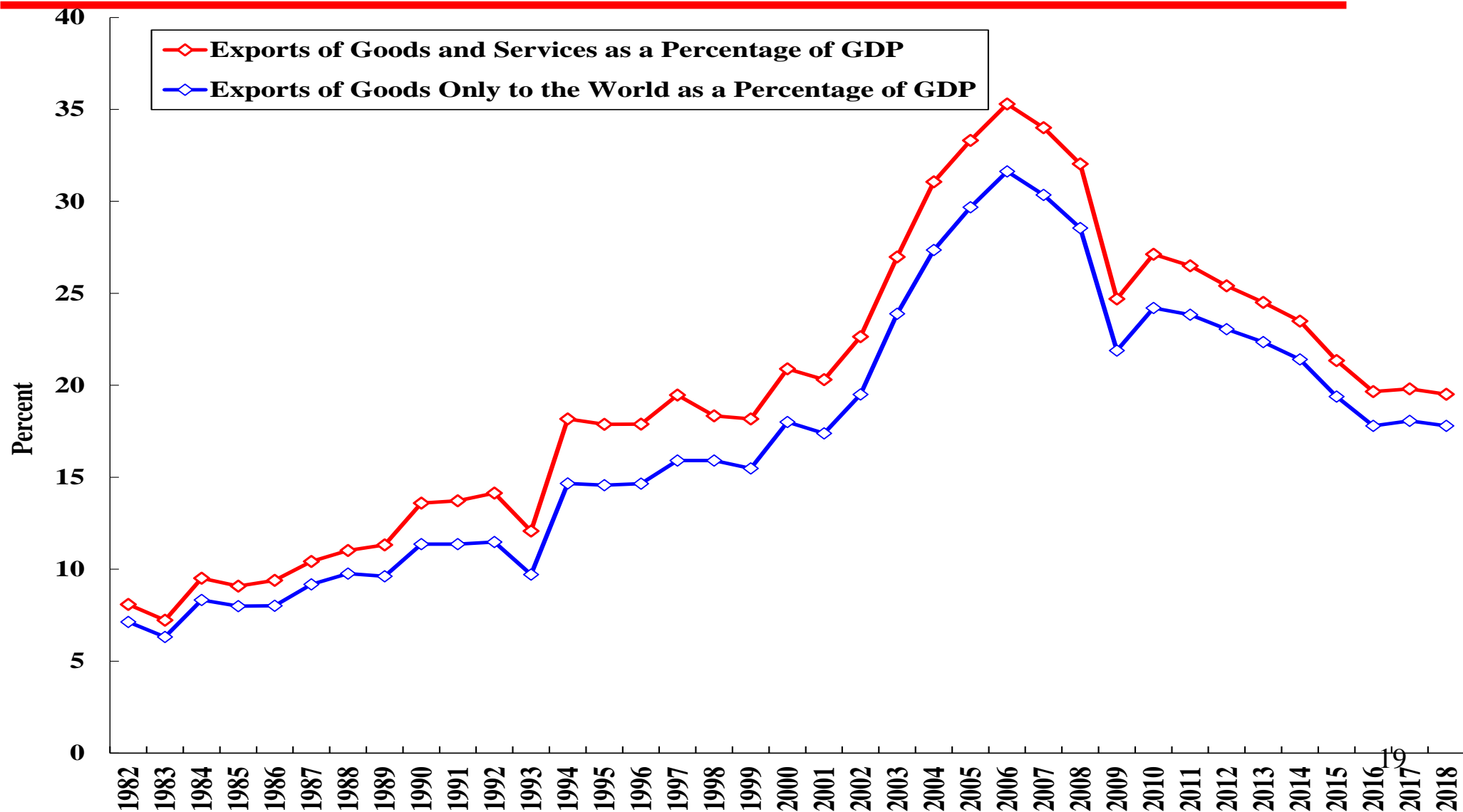
The Rate of Growth of US Non-Oil Price Index and the Chinese Share of Non-Oil Imports



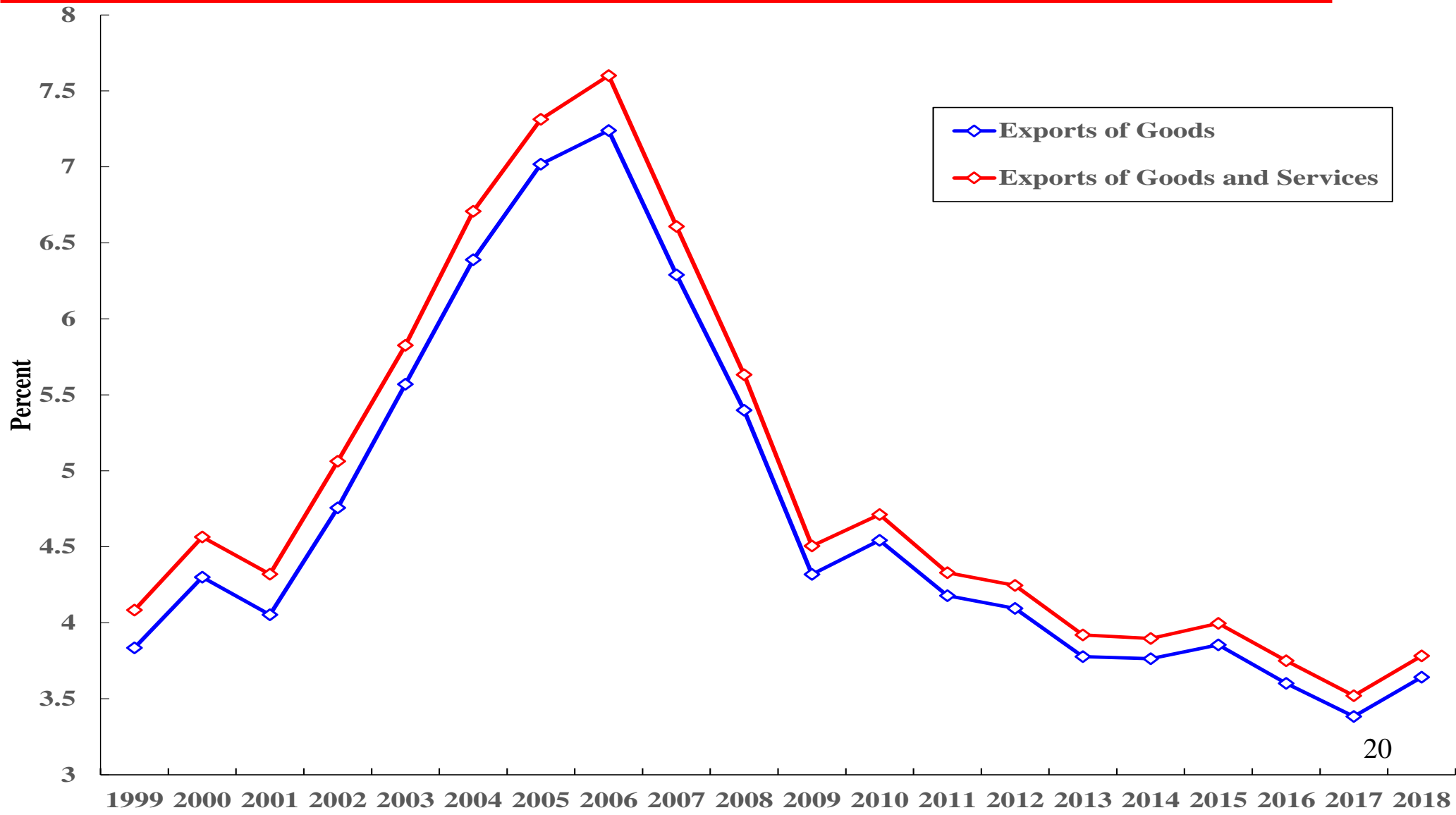
The Real Impacts of the Mutual Tariffs on the Two Economies

- ◆ Over the past ten years, Chinese dependence on exports has been declining. The share of exports of goods in Chinese GDP has fallen from a peak of 35.3% in 2006 to 19.5% in 2018. The share of exports of goods to the U.S. in Chinese GDP has also fallen by half, from a peak of 7.2% in 2006 to 3.6% in 2018. This sets a cap to the total amount of potential damages to the Chinese economy as a result of the U.S. tariffs. (See the following charts.)
- ◆ The 3.6% in 2018 represented an increase from the 3.4% in 2017. However, the increase reflected the acceleration of exports of goods to the U.S. from China in anticipation of the imposition and increases of tariffs. The trend of Chinese exports of goods to the U.S. as a percent of Chinese GDP is downwards.
- ◆ During this same period, the growth of Chinese exports to the world and to the U.S. has also slowed significantly. Chinese exports to the world grew at an average annual rate of 23.5% in the decade 1998-2007, but slowed to only 5.9% in the following decade, 2008-2018. Similarly, exports to the U.S. grew at 23.7% per annum in the decade 1998-2008, but slowed to less than 6.6% per annum in the most recent decade. Exports is no longer the engine of Chinese economic growth.

Chinese Exports of Goods and Services and Goods Only as a Percent of Chinese GDP



Chinese Exports of Goods and Services and Goods to the U.S. as Percent of Chinese GDP



The Real Impacts of the Mutual Tariffs on the Two Economies

- ◆ U.S. tariffs have been imposed on US\$250 billion of U.S. imports of goods from China (arrival value, approximately equal to US\$227 (250 x 10/11) billion of Chinese exports of goods to the U.S., f.o.b. or departure value), or slightly less than half of Chinese exports of goods to the U.S. in 2018. (Chinese exports of goods to the U.S. in 2018 amounted to US\$540 billion according to U.S. data based on arrival value, which is approximately equivalent to US\$500 billion at f.o.b. or departure value.) Thus, Chinese exports of goods amounting to slightly less than 1.8% (3.6%/2) of Chinese GDP will be affected in the first instance.
- ◆ The U.S. tariff rate on this first batch of Chinese exports of goods to the U.S. has recently been raised to 25% (and will be raised further to 30% on 1 October). Even at 25%, it is prohibitive for most of the Chinese exports of goods to the U.S., as neither the Chinese exporters nor the U.S. importers have the kind of profit margins that can absorb these tariffs. There is no evidence that the Chinese producers or exporters will pay for the U.S. tariffs. The cost of the tariffs will be mostly borne by U.S. consumers and users of Chinese imports.

Real Impacts on the Chinese Economy

- ◆ But the direct domestic value-added content of Chinese exports to the U.S. is less than 25%. Thus, the maximum loss in Chinese GDP, assuming that half of the exports to the U.S. is completely halted, in the first instance, may be estimated at 0.45% ($3.6\%/2 \times 0.25$), a manageable level, especially for an economy growing at an average annual real rate of 6.6 percent and with a per capita GDP of US\$9,410 in 2018.
- ◆ However, the reduction of exports leads to a reduction in the demands for domestic inputs used in their production, which in turn leads to a second-round reduction in the demand for domestic inputs used in the production of the domestic inputs. With the indirect, that is, second-, third-, fourth- and higher-round effects of the reduction of Chinese exports kicking in, the total domestic value-added affected will eventually increase to 66 percent cumulatively. This implies ultimately a maximum total loss in Chinese GDP of 1.19% ($(3.6\%/2 \times 0.66)$). In absolute terms, this amounts to US\$156 billion in 2018 prices.

Real Impacts on the Chinese Economy

- ◆ Bear in mind, however, that our calculation of the loss in real GDP and other similar calculations do not take into account the effects of any possible economic stimulus measures that may be undertaken by the Chinese government. They also do not take into account the possibility of substitution of Chinese exports of goods from factories located elsewhere. For example, instead of shipping from a factory in China, the factory owner can ship goods to the U.S. from another factory it owns in Vietnam and instead ship goods to Japan from its factory in China. This would result in no decrease in its total Chinese export of goods despite the U.S. tariffs. More generally, exports of goods originally destined for the U.S. can be sold elsewhere in the world. And global supply chains can be reconstituted with the final finishing stage located outside of China. (This must satisfy the “rules of origin” regulations.)
- ◆ The same can apply to Chinese imports of goods. For example, instead of importing soybeans from the U.S., the Chinese importers can import from Brazil, and the U.S. exporters can sell to the original customers for the Brazilian soybeans.

Real Impacts on the Chinese Economy

- ◆ There is also the threat of a 25% tariff on the remaining half of Chinese exports of goods to the U.S. (estimated to be almost US\$300 billion in terms of arrival value, according to U.S. data). Since a 25% tariff is basically already prohibitive, if implemented, it will mean the almost total cessation of Chinese exports of goods to the U.S. The maximum damage that can be done is 2.4% ($3.6\% \times 0.66$) of GDP, which is significant but not intolerable.
- ◆ Already, a 10% tariff was announced on this approximately US\$300 billion of Chinese exports of goods to the U.S. to be effective on 1 September 2019. A 10% tariff rate, unlike a 25% tariff rate, may still allow some Chinese exports of goods to continue. However, on 13 August, U.S. President Donald Trump announced that the tariff will be delayed until 15 December on goods such as cellphones, laptop computers, shoes and toys, amounting to approximately US\$160 billion, so as not to affect the Christmas shopping season. The tariff was dropped altogether on 25 types of products “based on health, ²⁴ safety, national security and other factors”.

Real Impacts on the Chinese Economy

- ◆ Yet, on 23 August, U.S. President Donald Trump announced that the tariff rate will be increased by 5% to 15% on 1 October.
- ◆ This last batch of Chinese exports to the U.S. consist of products such as the Apple iPhones (around US\$50 billion), personal computers, garments and shoes and packaged re-exports of semi-conductors. The incidence of the tariffs will be mostly borne by U.S. enterprises and households including Apple Inc. (One incidental and unintended beneficiary will be Samsung of South Korea whose Galaxy cellphones compete with the Apple iPhones and they are not subject to the new tariffs on U.S. imports from China.)

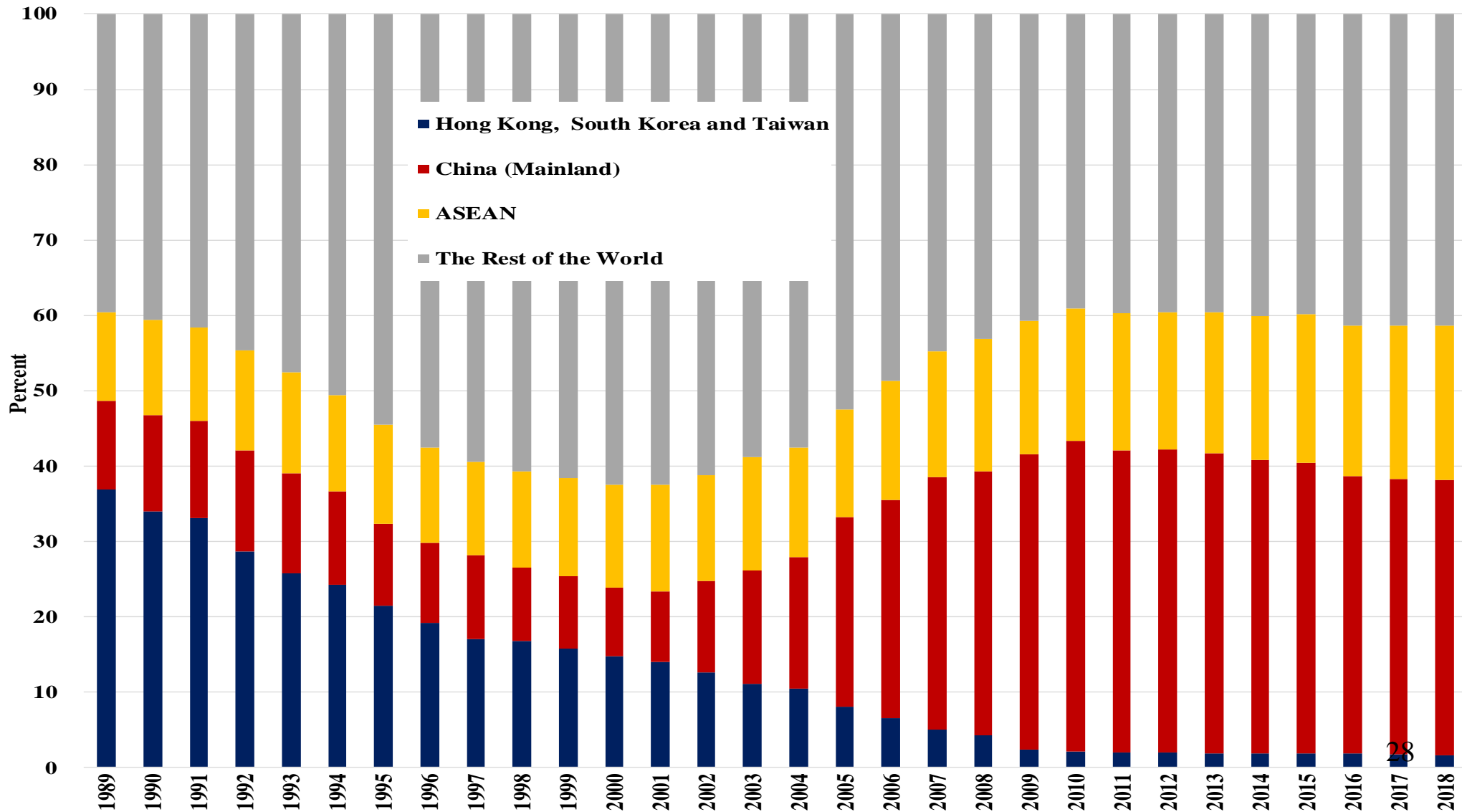
Real Impacts on the Chinese Economy

- ◆ It is instructive to recall what transpired during the Global Financial Crisis of 2008-2009, which was triggered by the collapse of Lehman Brothers in the U.S. in September 2008. Chinese exports of goods to the world and to the U.S. declined by 16.0% and 12.5% respectively in 2009, with a total decrease of Chinese exports of US\$230 billion (in 2009 prices), approximately the same magnitude as half of Chinese exports of goods to the U.S. in 2019. Yet the Chinese real GDP still managed to grow 9.7% and 9.4% in 2008 and 2009 respectively. What this shows is that a decline in Chinese exports of goods of this magnitude is still quite manageable for the Chinese economy.

Real Impacts on the Chinese Economy

- ◆ In the longer run, if tariffs continue on both sides, the U.S. importers will begin to replace Chinese imports by imports from other Asian countries such as Vietnam, Cambodia and Bangladesh, and eventually perhaps even North Korea if an agreement can be struck between it and the U.S.
- ◆ But the shift in the sourcing of imports away from China has already been occurring since 2010, because of the rise in labour costs in China and the appreciation of the Renminbi. This is similar to the earlier shift of the sources of U.S. imports of apparel from Hong Kong, South Korea and Taiwan to Mainland China (see the following chart).
- ◆ In 1989, the Chinese share of U.S. imports of apparel was 11.7 %, compared with a share of 35.9% from Hong Kong, South Korea and Taiwan combined, with the ASEAN accounting for 11.9%. In 2018, the Chinese share has declined from its peak of 41.2% in 2010 to 36.6% and the Hong Kong, South Korea and Taiwan share has declined to 1.6%, whereas the ASEAN share has risen to 20.5%. The new U.S. tariffs will accelerate this process.
- ◆ The ASEAN and South Asian countries may benefit, but it is really hard to predict by how much because the supply chains today are so internationalised. However, it is unlikely, in most cases, that the tariffs will stimulate new domestic production in the U.S.

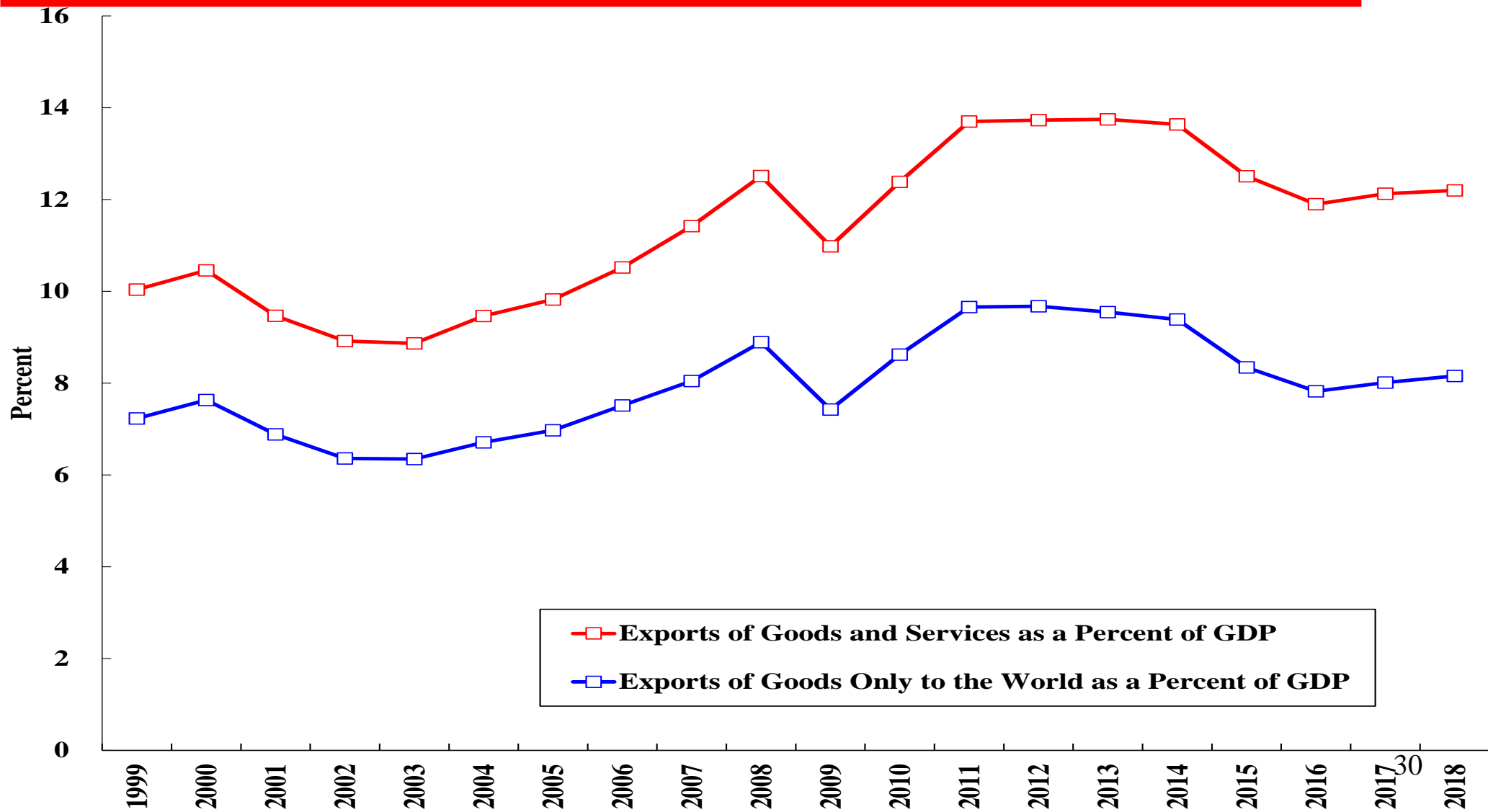
The Distribution of U.S. Apparel Imports by Countries and Regions of Origin



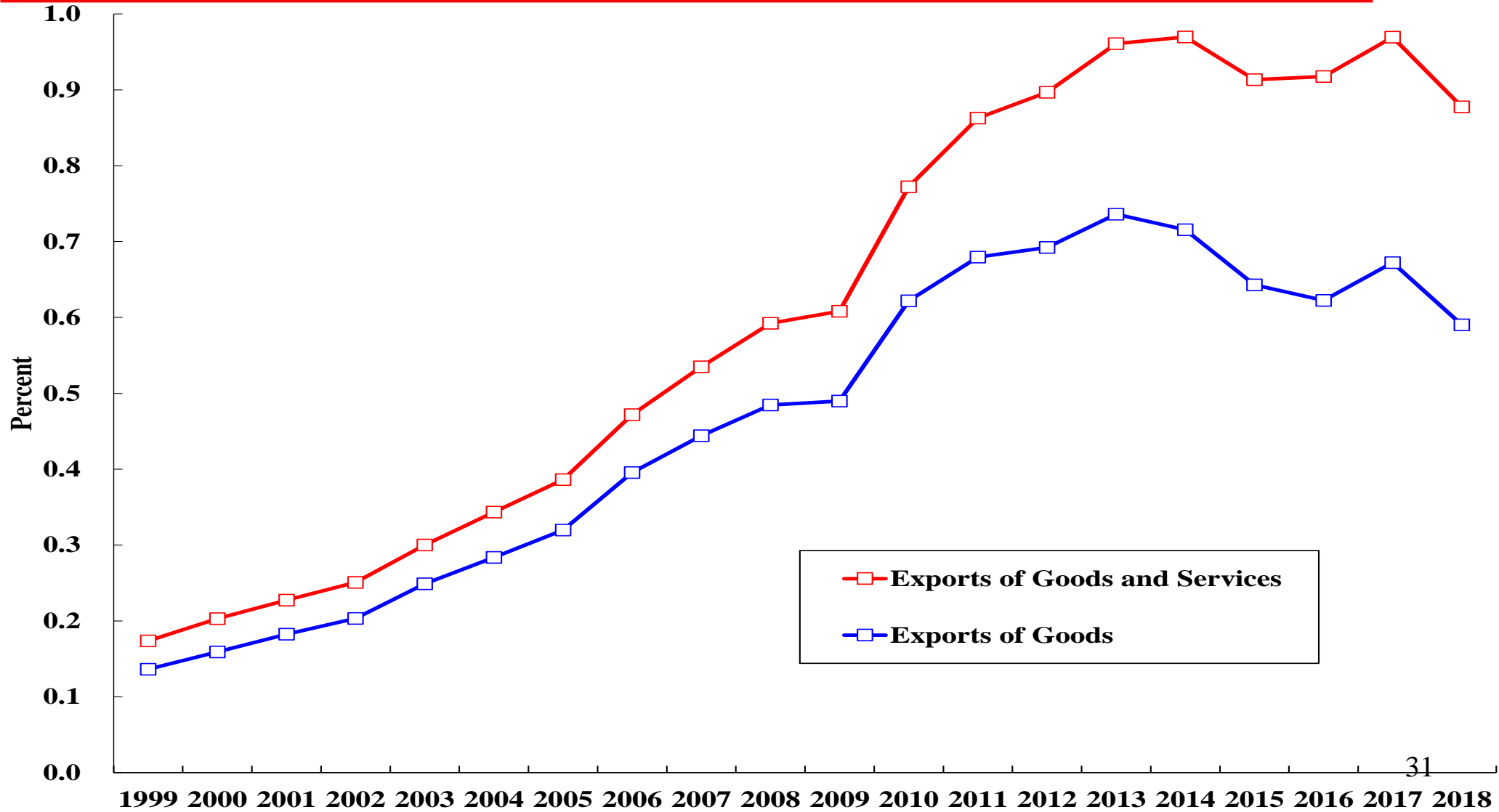
Real Impacts on the U. S. Economy

- ◆ The degree of dependence of the U.S., a large continental economy, on exports is even lower than that of China's. U.S. exports of goods and services combined as a share of GDP was 12.2% in 2018. The exports of goods alone as a share of GDP was only 8.2%.
- ◆ In 2018, the shares of U.S. exports of goods and services and goods alone to China in U.S. GDP declined from 0.97% to 0.88% and 0.67% to 0.58% respectively, reflecting the effects of the trade war (all of which were borne by the exports of goods). In absolute value, the exports were respectively US\$180 billion and US\$121 billion in 2018, much lower than those of Chinese exports to the U.S. However, the shares of U.S. exports of both goods and services and goods only to China have been rising over time until more recently.
- ◆ At the present time, Chinese tariffs have been imposed on US\$110 billion of U.S. exports of goods, with rates up to 25%. The tariff rates have recently been adjusted upwards on approximately US\$75 billion worth of U.S. exports to China.

U.S. Exports of Goods and Services and Goods Only as Percent of U.S. GDP



U.S. Exports of Goods and Services and Goods Only to China as Percent of U.S. GDP



Real Impacts on the U. S. Economy

- ◆ The direct domestic value-added content of U.S. exports of goods to China may be estimated to be 50.8%. Thus, the maximum loss in the U.S., assuming that all of its exports to China is completely halted by the tariffs, may be estimated in the first instance at 0.29% ($0.58\% \times 0.508$), less than the initial impact on Chinese GDP of 0.43%, based on the assumption that half of Chinese exports of goods to the U.S. will be halted.
- ◆ Moreover, it is unlikely that all of the U.S. exports of goods will be halted; for example, computer chips will continue to be imported by China in large quantities in the medium term. (The price elasticity is low.) Suppose only half of U.S. exports of goods to China is halted, it would amount to a loss of U.S. GDP of 0.145% ($0.29\%/2$). This is not significant for the U.S. economy, which grew 2.9% in 2018. U.S. GDP per capita is approximately US\$62,609. The U.S. economy can easily weather a reduction of 0.145% in its rate of growth.

Real Impacts on the U. S. Economy

- ◆ With the indirect, that is, second-, third-, fourth- and higher-round effects of the reduction of U.S. exports of goods kicking in, the total domestic value-added affected increases to 88.7% cumulatively. This implies ultimately a total loss in U.S. GDP of 0.26% ($0.58\%/2 \times 0.887$), assuming that half of U.S. exports to China will be halted.
- ◆ In absolute terms, this amounts to US\$53.3 billion (0.26×20.5 trillion) in 2018 prices, much less than the estimated Chinese loss in terms of GDP of US\$156 billion.
- ◆ Thus, in both absolute and relative terms, the Chinese losses in real GDP will be much higher than those of the U.S.
- ◆ However, the U.S. has a significant trade surplus in services with China, estimated to be US\$40 billion by the U.S. Government but US\$54 billion by the Chinese Government for 2017. This surplus may be in jeopardy if China-U.S. relations deteriorate further.

Economic and Technological Competition

- ◆ One of the principal causes of the current trade war between China and the United States is actually not trade itself, but the potential competition between China and the U.S. for economic and technological dominance in the world.
- ◆ This competition, whether explicit or implicit, and whether intentional or not, will not go away soon. It did not begin with President Donald Trump. Both the “pivot to Asia” and the “Trans-Pacific Partnership” were initiated by President Barack Obama as initiatives aimed in part at containing China. It will not go away even after President Trump leaves office.
- ◆ However, competition can potentially lead to constructive and positive as well as destructive and negative outcomes. For example, the competition on creating the fastest super-computer has already resulted in both countries producing better and faster super-computers. The champion in 2018 is the IBM Summit, a U.S. super-computer, which beat the Sunway TaihuLight, the champion in 2016 and 2017, a Chinese super-computer that was built entirely with indigenously designed chips.

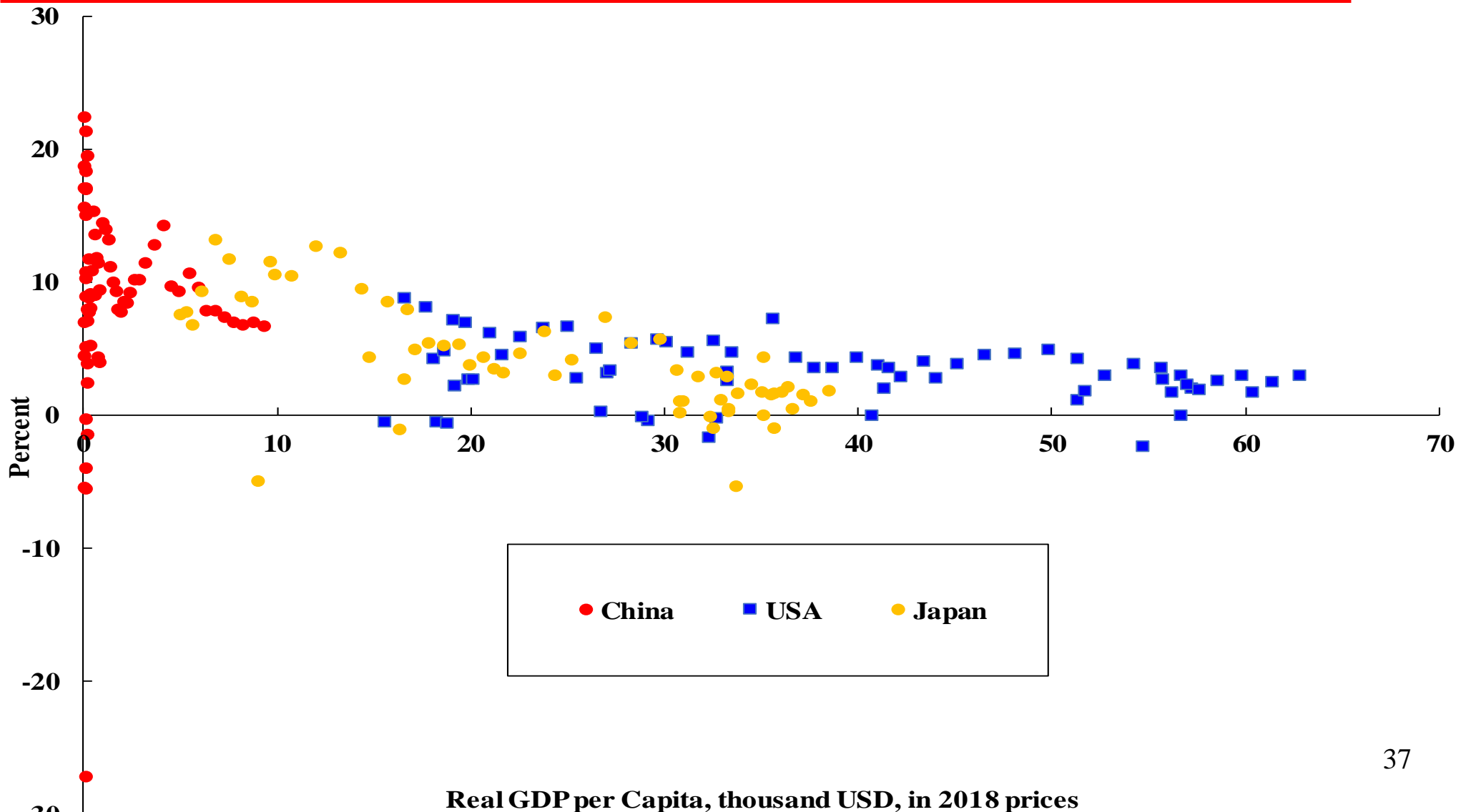
Economic and Technological Competition

- ◆ In terms of aggregate GDP, China went from only one-fifth of the U.S. GDP in 2000 to two-thirds in 2017, taking only 17 years (64.1% in 2018 because of exchange rate changes). It is only a matter of time that the Chinese GDP will catch up with the U.S. GDP, probably in the early 2030s. However, in terms of GDP per capita, China is still way behind, with US\$9,410 compared to almost US\$62,609 for the U.S. in 2018. My own projections suggest that it will probably take until the end of the 21st Century before Chinese GDP per capita approaches the U.S. level.
- ◆ In terms of the number of nuclear-armed warheads, according to the New York Times, the U.S. is estimated to have more than 6,000 such warheads, compared to less than 300 for China. The difference is even more striking in per capita terms. This is not a competition that China should wish to join. However, a race to find an effective cure for cancer or Alzheimer's disease would be worthwhile for both countries and in fact for the entire mankind.

Projections of the Future: Long-Term Forecasts of the Chinese and the U.S. Economies

- ◆ It is assumed that the Chinese economy will continue to grow around 6% per annum for a few more years, declining gradually to between 5% and 6%, and that the U.S. economy will grow at an average rate of 3% per annum between now and 2050.
- ◆ In 2018, the Chinese economy grew 6.6%. In 2019H1, Chinese real GDP grew at an annualised rate of 6.3%. The target range of the Chinese rate of growth for 2019 is between 6% and 6.5%. The Chinese economy is on course.
- ◆ The U.S. economy grew 2.9% in 2018, close to its long-run average of 3%. The rates of growth of 2019Q1 and 2019Q2 were respectively 3.1% and 2.1%. Both the U.S. Federal Reserve Board and the U.S. Congressional Budget Office expect 2.3% growth for 2019.
- ◆ It may be thought that the Chinese economy will be unable to sustain an average annual rate of growth of between 5% and 6% for such a long time. Past experience shows that the rate of growth of an economy declines as its real GDP per capita rises. But given the still relatively low level of real GDP per capita in China, and the low level of its capital per unit labor, such a rate of growth should still be possible for at least several decades (see the following charts in which the experiences of China, Japan and the U.S. are compared.)

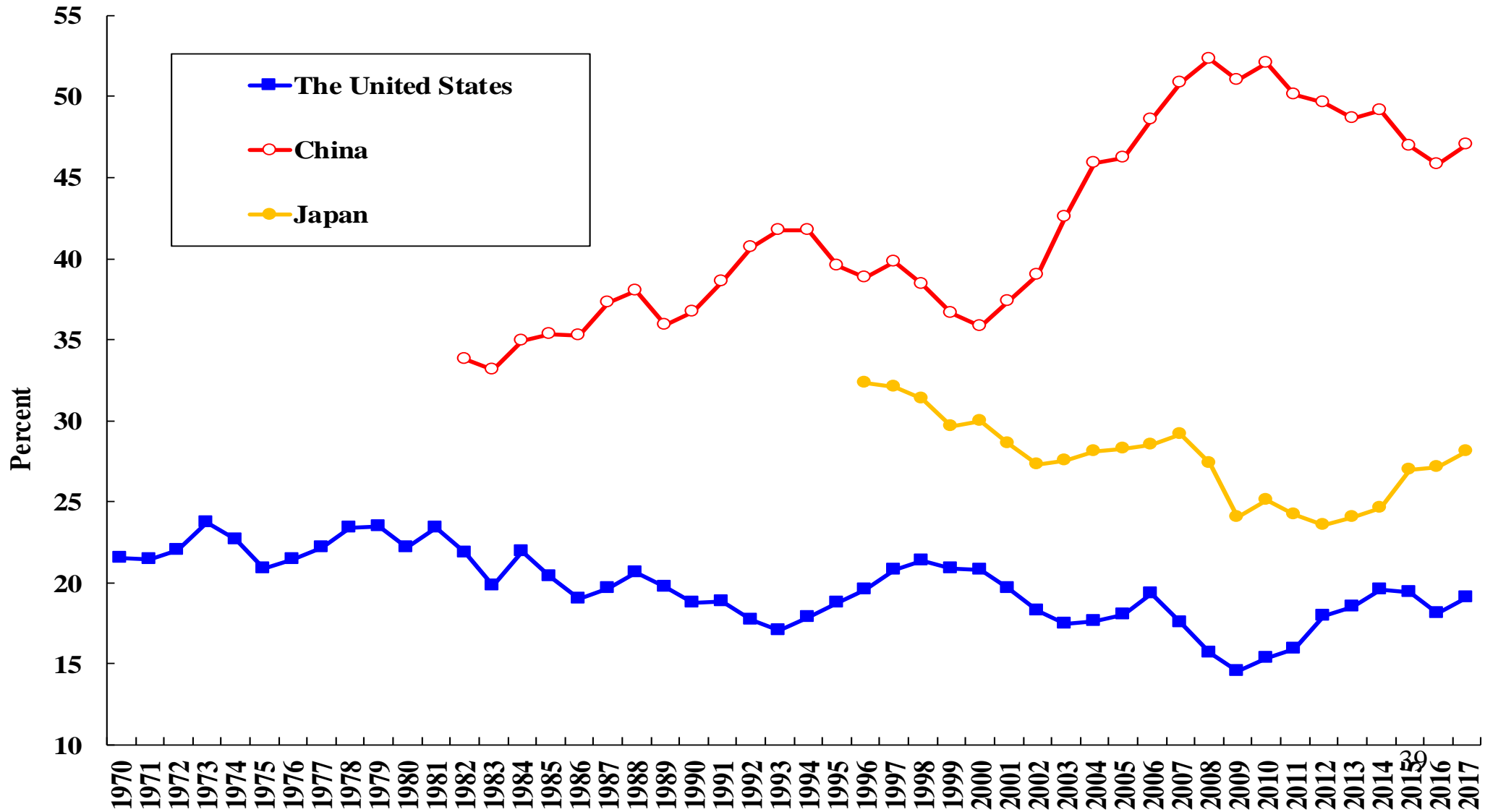
Growth Rate vs. Level of Real GDP per Capita (2018 tril. US\$): China, Japan and the U.S.



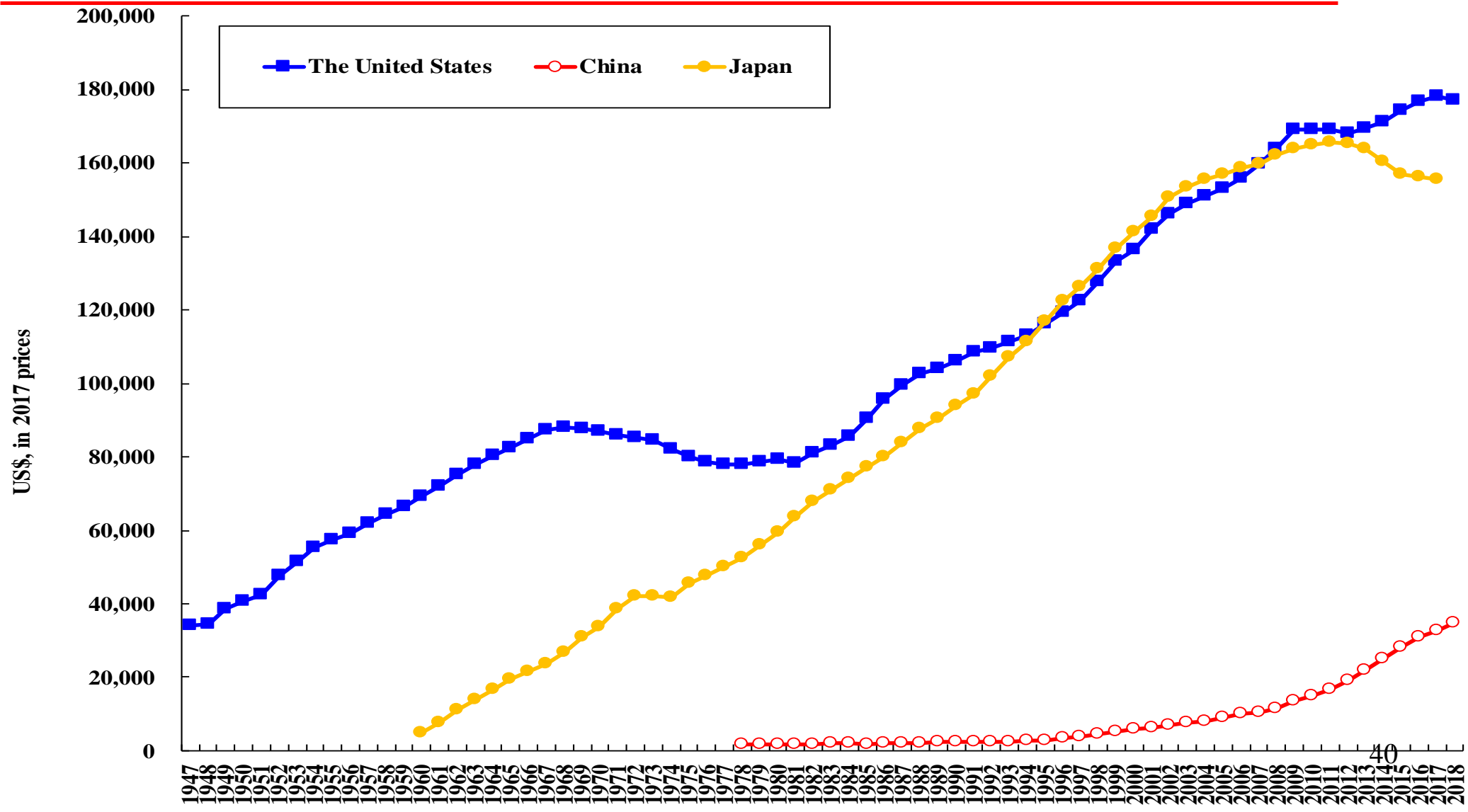
Projections of the Future: Long-Term Forecasts of the Chinese and the U.S. Economies

- ◆ The Chinese national savings rate is very high, which enables a very high investment rate. The capital-labour ratio of the Chinese economy is still very low compared to the U.S. and Japan. There is a great deal of room to grow.
- ◆ In addition, there is still significant surplus labour in the Chinese economy. The share of employment in the primary sector is around 30% whereas the share of GDP originating from the primary sector is below 10%.
- ◆ The projections of Chinese and U.S. real GDP and real GDP per capita between now and 2050 are presented in the following charts.

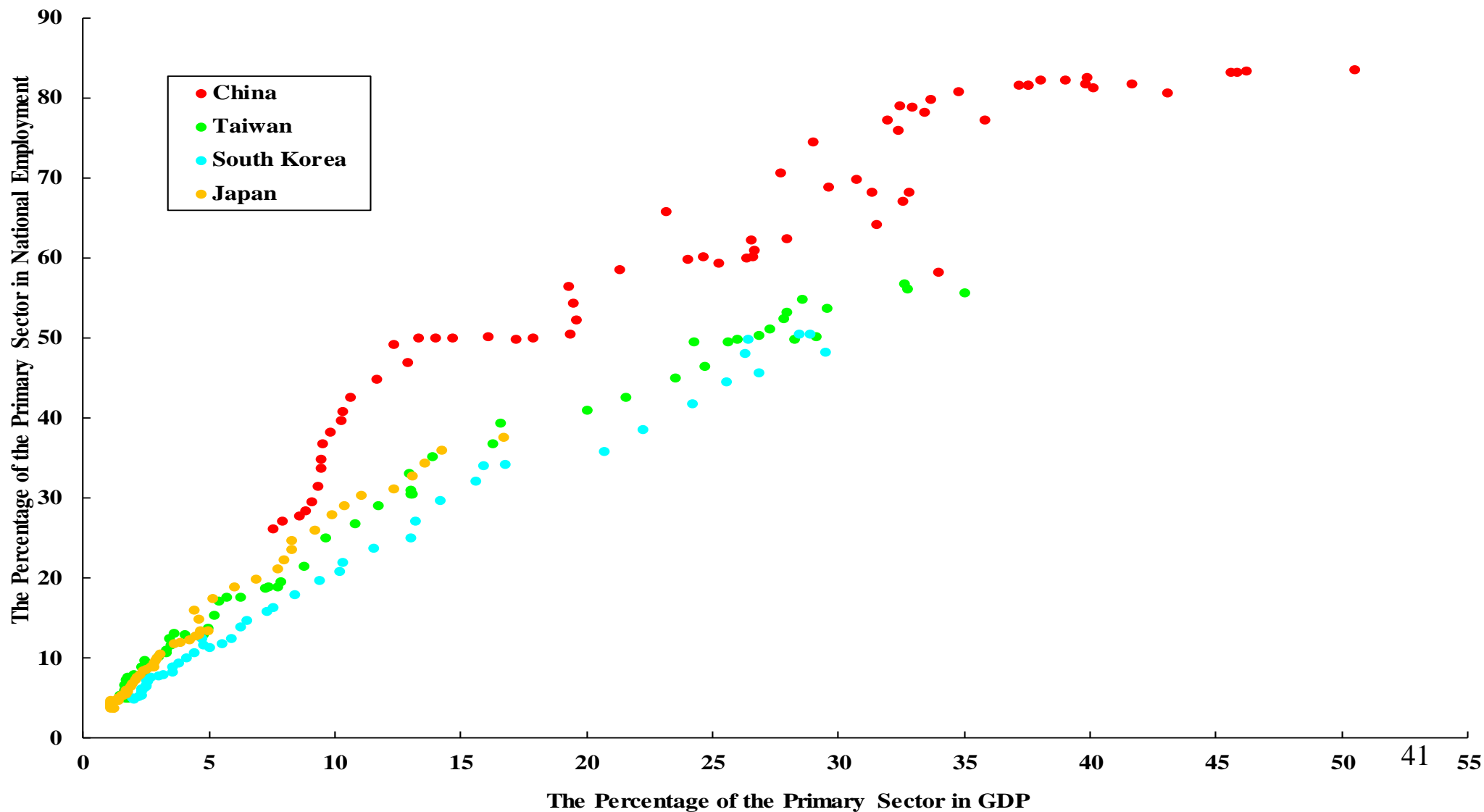
Comparison of National Savings Rates: China, Japan and the U.S.



Comparison of Capital-Labour Ratios: China, Japan and the U.S.



Scatter Diagram between the Shares of Employment and GDP of the Primary Sector



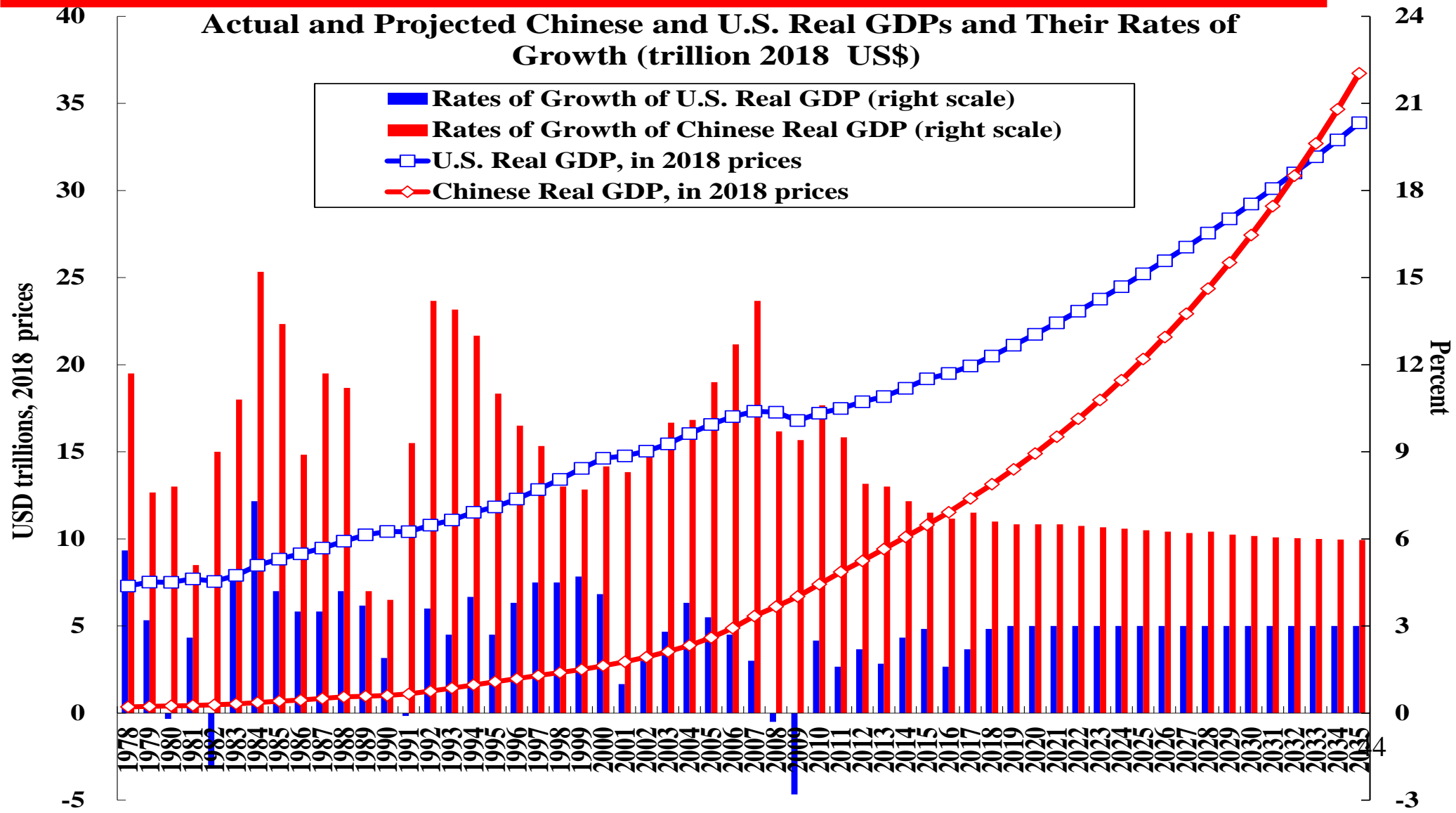
Projections of the Chinese and the U.S. Economies

- ◆ In his work report to the Nineteenth National Congress of the Communist Party of China, President XI Jinping identified several milestones in his speech at the Nineteenth Party Congress at 2020, 2035 and 2050.
- ◆ The first milestone is to become a moderately well-off society by 2020. Our projections show that by 2020, Chinese real GDP per capita (in 2018 prices) will reach US\$10,582 (compared to US\$65,541 for the U.S.).
- ◆ Our projections also show that by 2033 (plus or minus a couple of years), Chinese real GDP will surpass U.S. real GDP (US\$32.7 trillion versus US\$31.9 trillion), making China the largest economy in the world. However, in terms of real GDP per capita, China will still lag behind significantly, with US\$22,088 compared to US\$89,363 for the U.S.

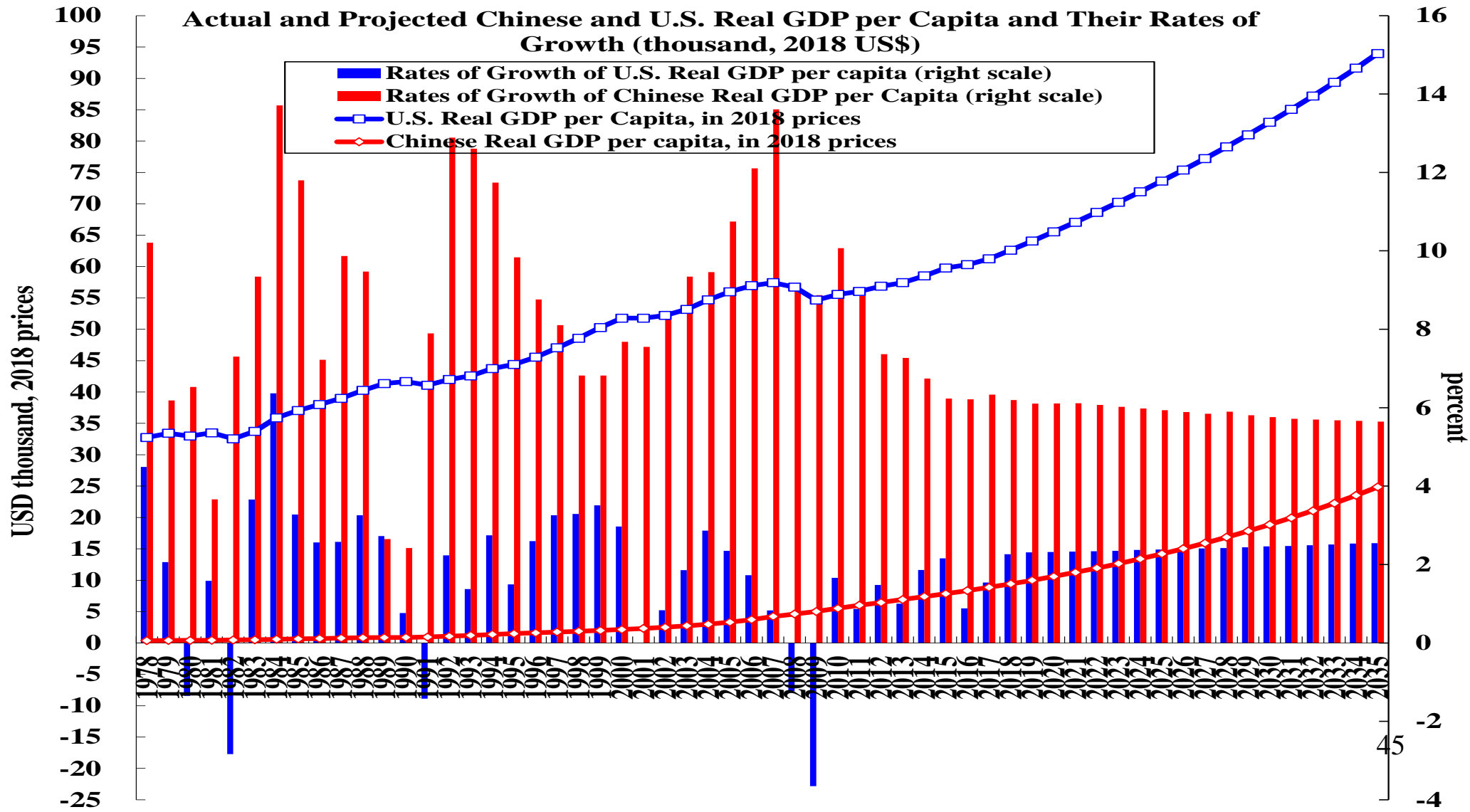
Projections of the Chinese and the U.S. Economies

- ◆ By 2050, Chinese real GDP will reach US\$83 trillion compared to US\$53 trillion for the U.S. In terms of real GDP per capita, China will reach US\$53,408, still below the current (2018) level of U.S real GDP per capita of US\$62,609, compared to US\$138,693 for the U.S.
- ◆ It will not be until towards the end of the 21st Century for the Chinese real GDP per capita to catch up with the U.S. real GDP per capita.

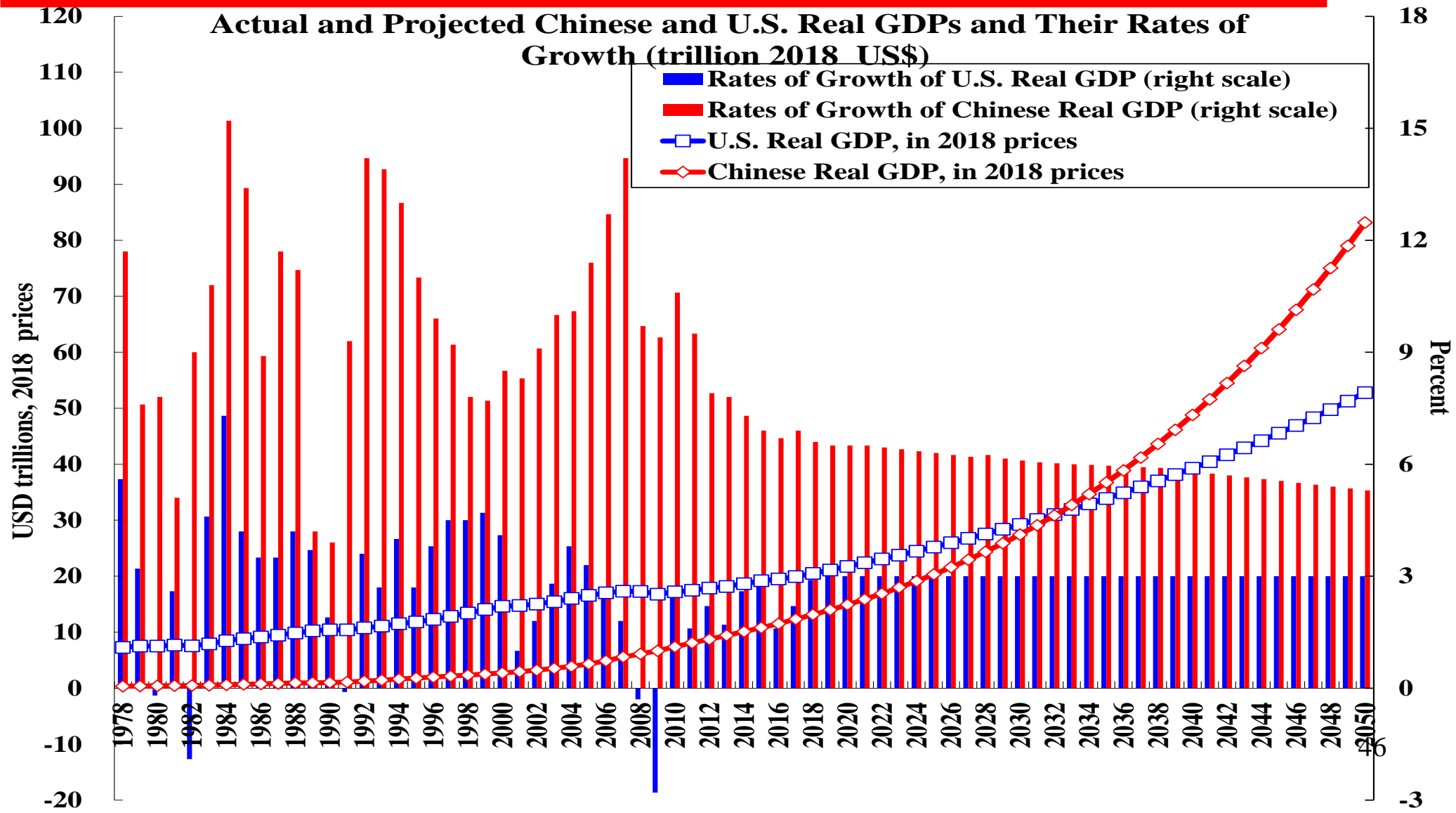
Actual and Projected Levels and Growth Rates of Chinese and U.S. Real GDP (2018 tril. US\$)



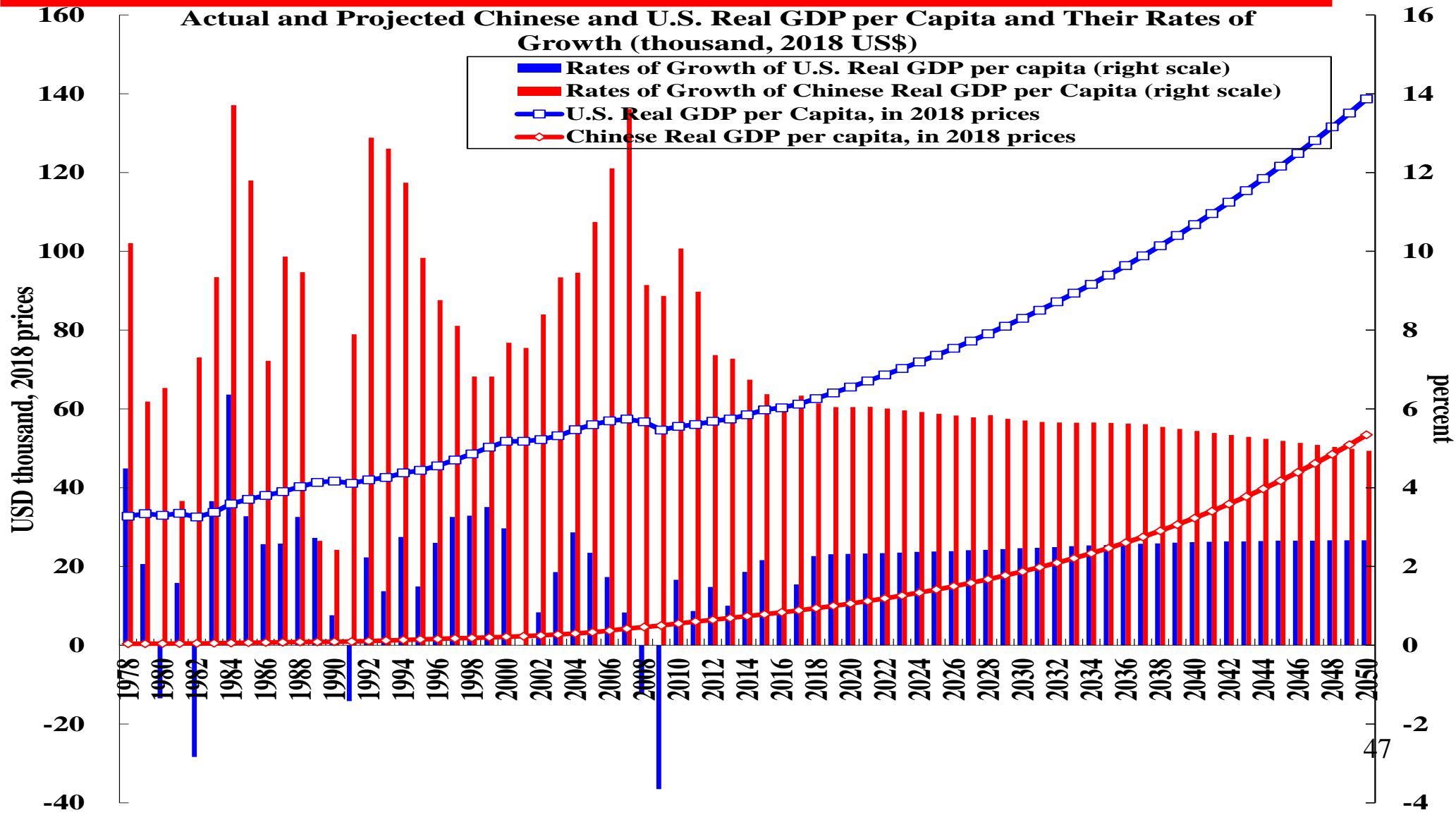
Actual and Projected Chinese and U.S. Real GDP/Capita and Their Annual Rates of Growth (1,000 2018 US\$ & %)



Actual and Projected Levels and Growth Rates of Chinese and U.S. Real GDP (2018 tril. US\$)



Actual and Projected Chinese and U.S. Real GDP/ Capita and Their Rates of Growth (1,000 2018 US\$)



Technological Competition

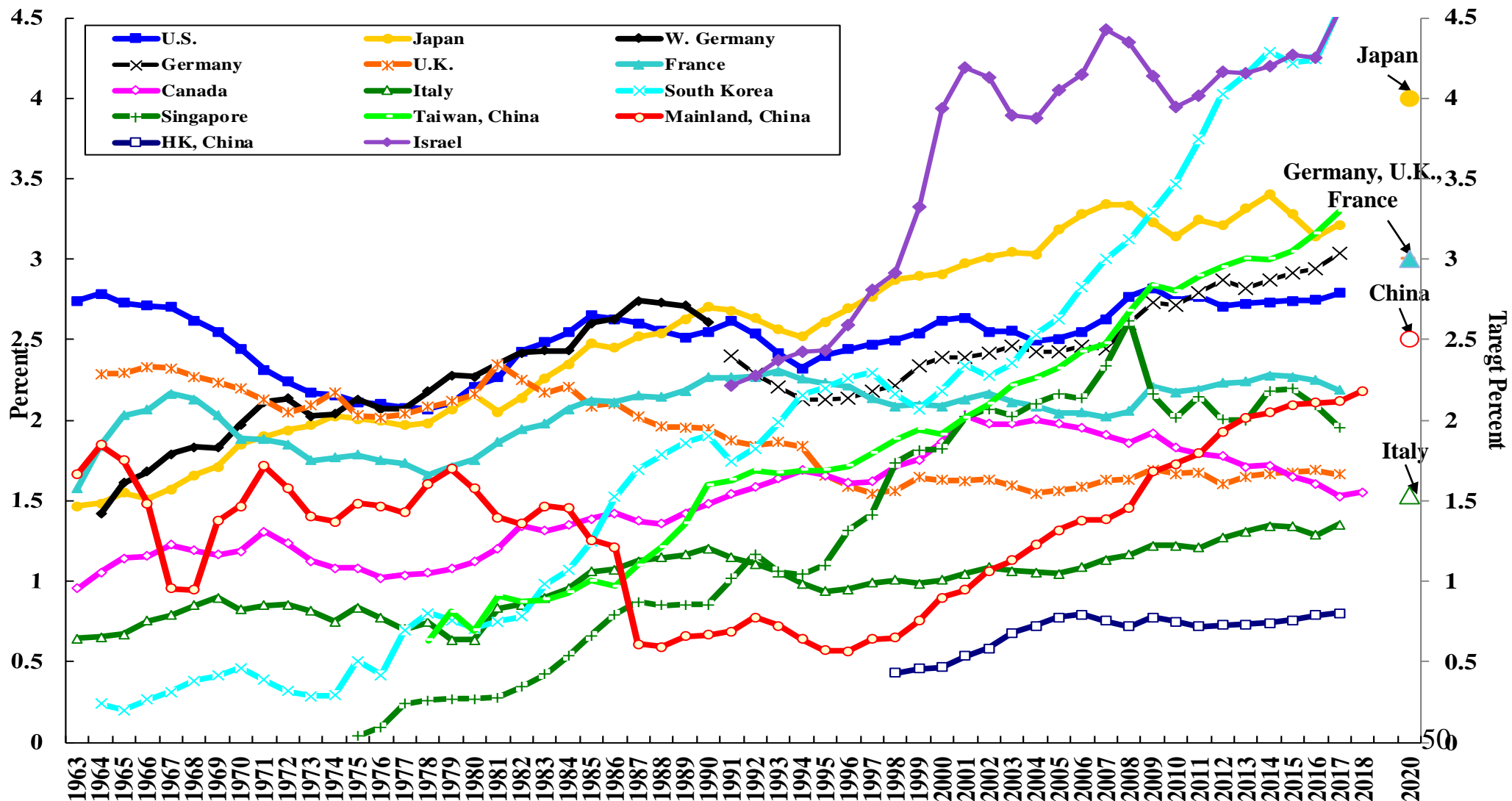
- ◆ Technological competition is motivated by national security considerations as well as commercial considerations.
- ◆ No individual or firm will want to give away or sell its core competence. In old China, masters typically do not teach their apprentices everything, unless they are male lineal descendants.
- ◆ It should therefore not be surprising that nations will protect their core competences,
- ◆ In the case of the atomic bomb—the former Soviet Union developed it independently; China developed it independently, without any foreign assistance; the U.K., France, India, Pakistan and even North Korea developed their nuclear bombs independently.
- ◆ China will have to continue to develop its own advanced semiconductor, artificial intelligence, and aircraft industries as it may not be able to import the best available from other countries.

Technological Competition

- ◆ Investment in intangible capital (human capital and Research and Development (R&D) capital) is indispensable for innovation.
- ◆ The annual expenditure on R&D as percentages of GDP are presented for selected economies in the following chart.
- ◆ The chart shows that the U.S. has consistently invested a relatively high percentage of its GDP in R&D, averaging 2.5% since 1963. The East Asian economies, including Mainland China, has been catching up fast, with the exception of Hong Kong.
- ◆ China is expected to reach its target of 2.5% of GDP in 2020, approximately the same as the average U.S. share over the past more than fifty years. However, it will still be below the expected or targeted levels of the European countries (France, Germany and the U.K.), Japan and South Korea.

R&D Expenditures as a Share of GDP and Their Target Levels at 2020: G-7 Countries, 4 East Asian NIEs, China & Israel

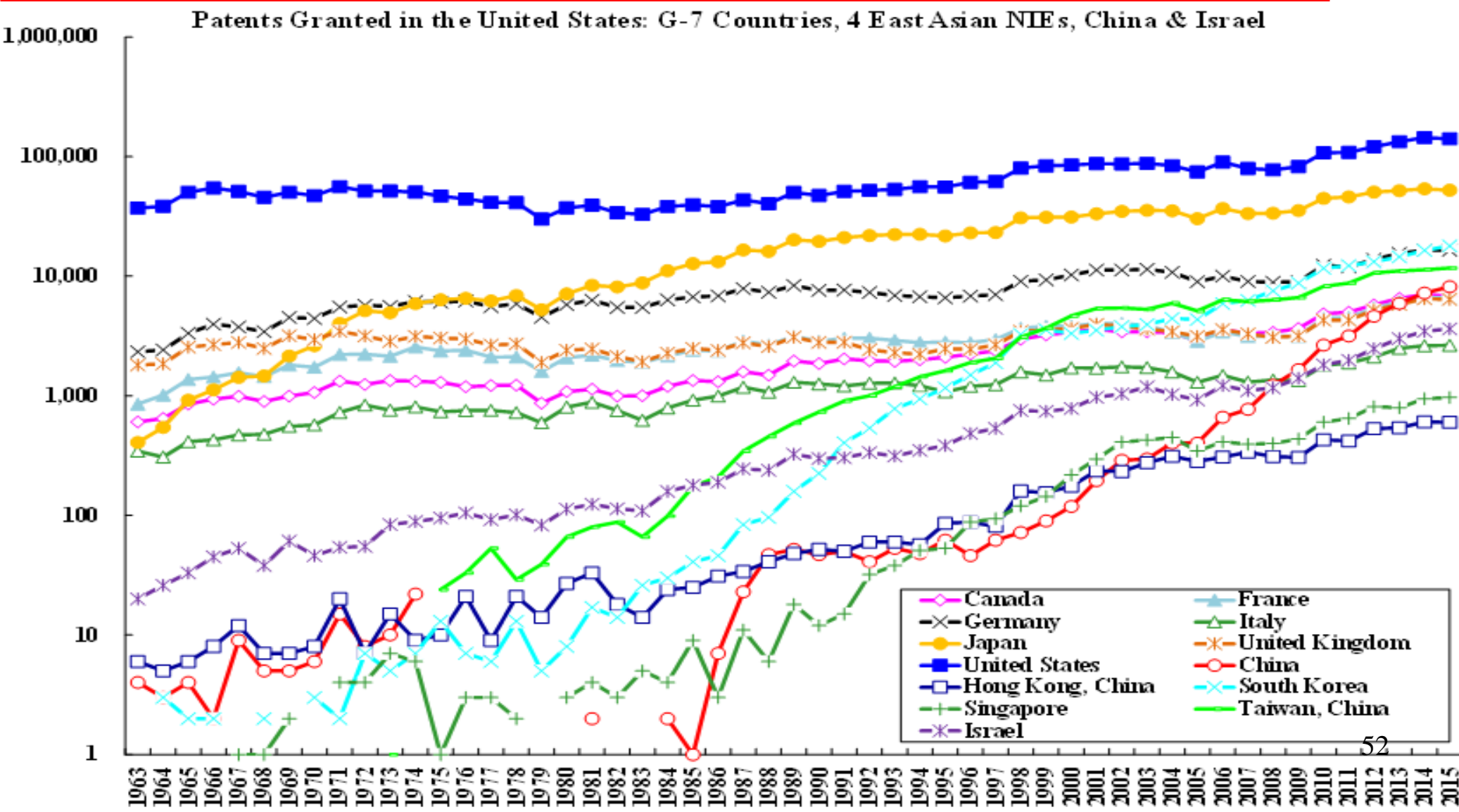
R&D Expenditures as a Ratio of GDP: G-7 Countries, 4 East Asian NIEs, China & Israel



Investment in Intangible Capital (R&D Capital)

- ◆ One indicator of the potential for technical progress is the number of patents created each year. In the following chart, the number of patents granted in the United States each year to the nationals of different countries, including the U.S. itself, over time is presented.
- ◆ The U.S. is the undisputed champion over the past forty years, with 140,969 patents granted in 2015, followed by Japan, with 52,409. (Since these are patents granted in the U.S., the U.S. may have a home advantage; however, for all the other countries and regions, the comparison across them should be fair.)
- ◆ The number of patents granted to Mainland Chinese applicants each year has increased from the single-digit levels prior to the mid-1980s to 8,166 in 2015.
- ◆ The economies of South Korea and Taiwan, granted 17,924 and 11,690 U.S. patents respectively in 2015, were far ahead of Mainland China. In contrast, the number of U.S. patents granted to Hong Kong nationals was only 601 in 2015.

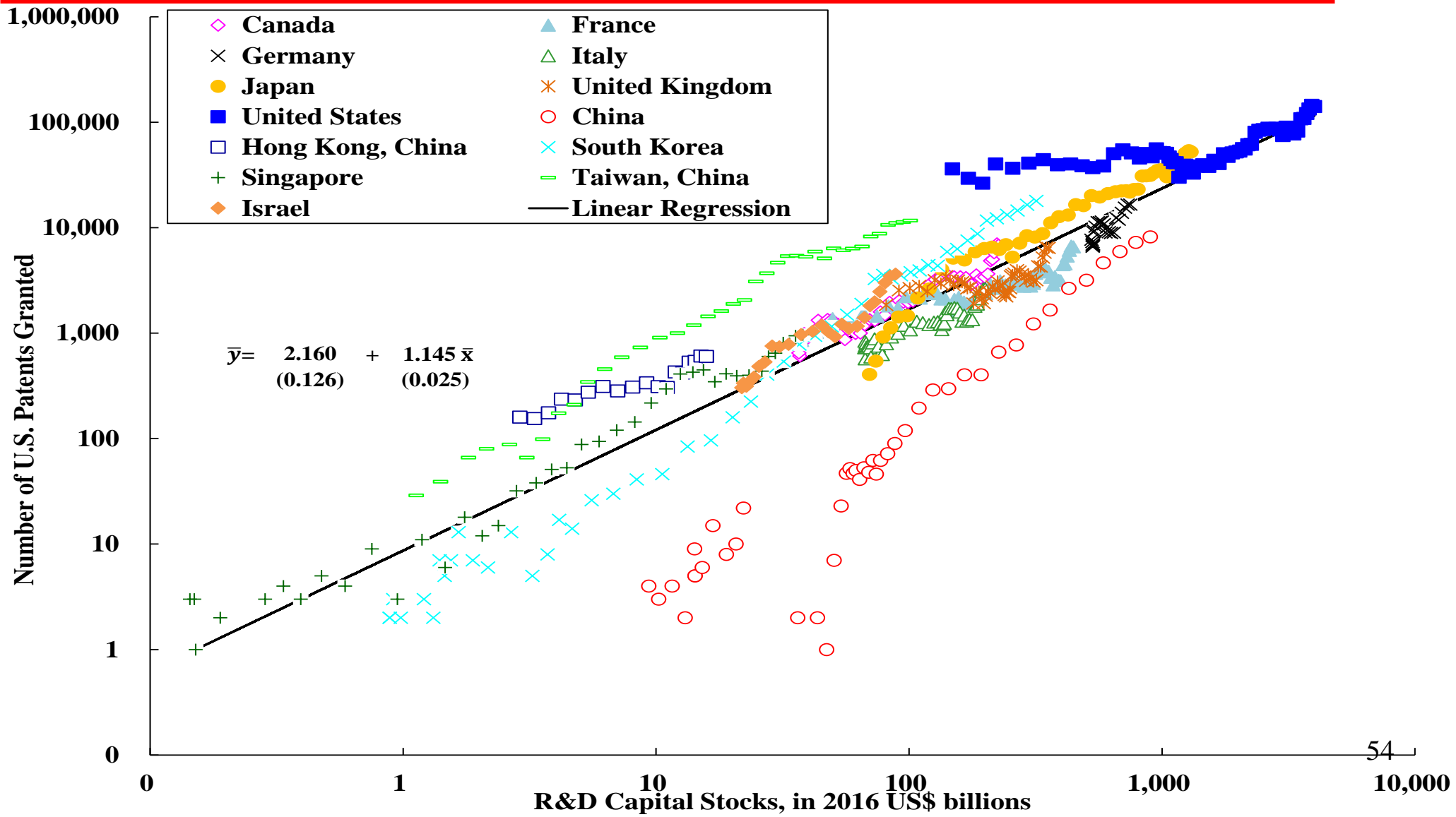
Patents Granted in the United States: G-7 Countries, 4 East Asian NIEs, China & Israel



Investment in Intangible Capital (R&D Capital)

- ◆ The R&D capital stock, defined as the cumulative past real expenditure on R&D less depreciation of 10% per year, is an useful indicator of innovative capacity. R&D expenditure should quite properly be treated as investment since R&D efforts generally take years to yield any results.
- ◆ The R&D capital stock can be shown to have a direct causal relationship to the number of patents granted (see the following chart, in which the annual number of U.S. patents granted is plotted against the R&D capital stock of that year for each economy).
- ◆ The chart shows clearly that the higher the stock of R&D capital of an economy, the higher is the number of patents granted to it by the U.S.

U.S. Patents Granted and R&D Capital Stocks: G-7 Countries, 4 EANIEs, China & Israel

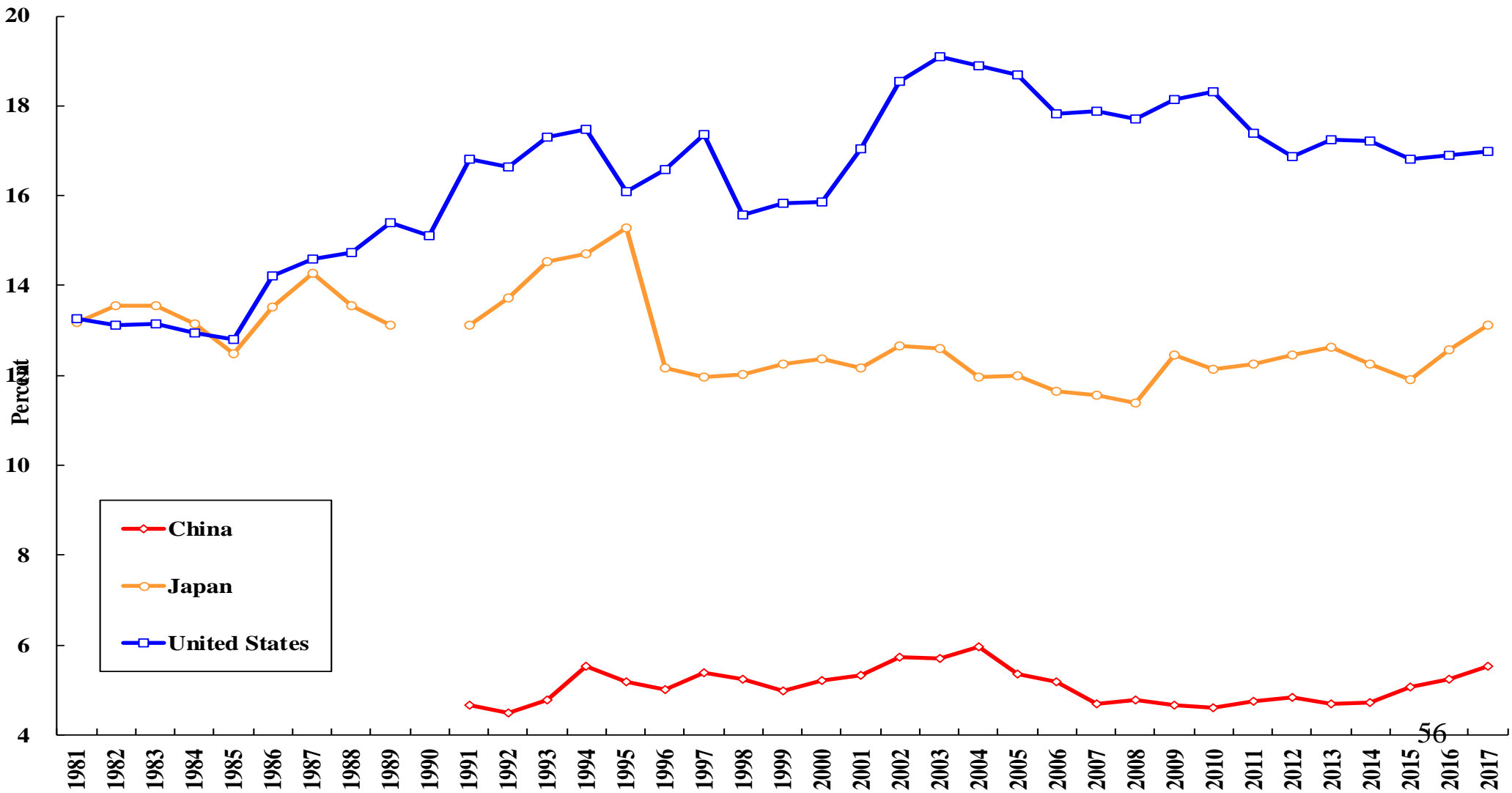


Technological Competition

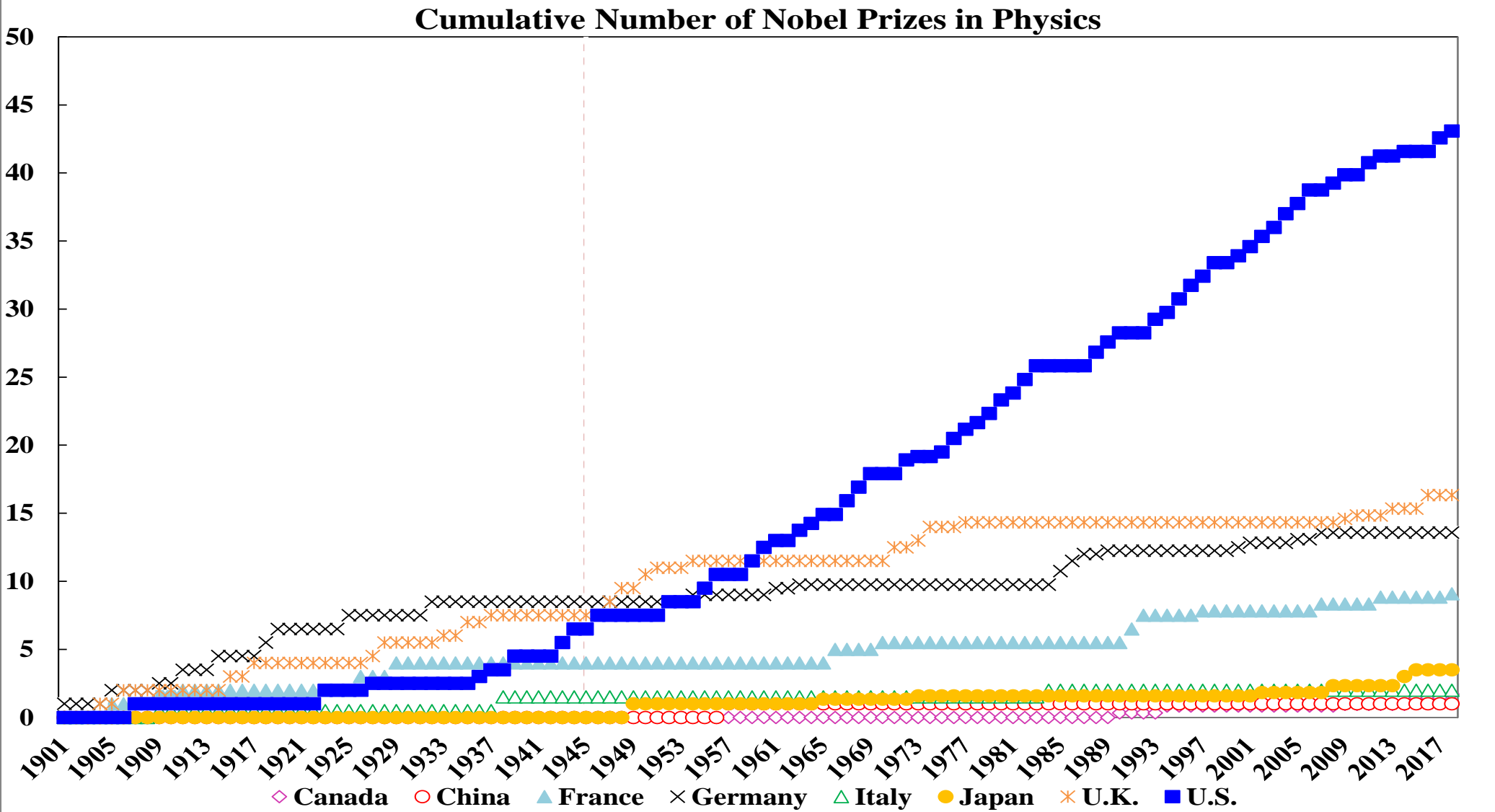
- ◆ The long-term determinant of the outcome of technological competition is the capacity for innovation. China has the same advantages as the U.S. in terms of the economies of scale, learning-by-doing and larger number of persons in the upper tail of the ability distributions.
- ◆ However, in order for break-through discovery or invention to be made, there must be significant investment in basic research.
- ◆ Basic research is by definition patient and long-term research. The rate of return, at any reasonable discount rate, will be low. It must therefore be financed by the government or non-profit institutions and not by for-profit firms.
- ◆ The atomic and hydrogen bombs, the nuclear reactors, the internet, the packets transmission technology and the browser are all outcomes of basic research done many years ago.
- ◆ However, Chinese investment in basic research has remained low relative to the other major countries (see the following chart). China devoted only 5 percent of its R&D expenditures to basic research, compared to the more than 15 percent of the U.S.
- ◆ The U.S. has a commanding lead in many basic scientific disciplines, reflected in for example, the cumulative number of Nobel Laureates. Of course, China is ahead in selected fields. For example, Huawei is a global leader in 5G technology.

Basic Research Expenditure as a Share of Total R&D Expenditure: China, Japan and the U.S.

Basic Research Expenditure as a Percentage of Gross Expenditure on R&D



Technological Competition: Cumulative Number of Nobel Laureates in Physics



Economic Complementarities between China and the U.S.

- ◆ China and the U.S. have very different economic endowments. China has a large population that is more than four times that of the U.S. The U.S. has more arable land, more tangible capital stock, and almost four times more R&D capital stock than China.
- ◆ China has a high savings rate and the U.S. has a low savings rate. Chinese savings exceed Chinese investment and U.S. savings are less than U.S. investment. China is a capital exporter and the U.S. a capital importer.
- ◆ Economic theory tells us that the more different two economies are, the greater they potentially benefit from trading with each other.

Economic Complementarities between China and the U.S.

	China			U.S.		
	2015	2016	2017	2015	2016	2017
Population, thousands persons	1,374,620	1,382,710	1,390,080	321,323	323,668	325,983
Arable land, thousand hectare	134,999	134,921	134,863	152,263	152,263	
Tangible capital stock, 2016 prices, US\$ billions	21,268	23,405	25,351	26,953	27,657	28,061
Real R&D capital stock, 2016 prices, US\$ billions	898	1,015	1,139	4,005	4,106	4,205
Working-age population (ages 15-64), persons	996,030,376	995,072,896	993,792,919	212,357,568	213,254,816	213,911,387
Sources:						

Population, yearend for China, from National Bureau of Statistics of China (NBSC) and midyear for the U.S., the U.S. Bureau of Economic Analysis (BEA).

Arable land, for China, from the National Bureau of Statistics of China, and for the U.S. from the Food and Agriculture Organisation of the United Nations

Tangible capital stock, estimated by Lawrence J. Lau from national income accounts data.

Real R&D capital stock, estimated by Lawrence J. Lau and Yanyan Xiong (2018).

Working-age population, from the World Bank, World Development Indicators (WDI) Database.

Economic Complementarities between China and the U.S.

	China			U.S.		
	2015	2016	2017	2015	2016	2017
Arable land per capita, hectare	0.098	0.098	0.097	0.474	0.470	
Real capital stock per capita, in 2016 prices, US\$	15,472	16,927	18,237	83,880	85,448	86,080
Real R&D capital stock per capita, in 2016 prices, US\$	654	734	819	12,463	12,685	12,900
Working age population per						

Coordinated Expansion of Trade

- ◆ A bilateral trade gap can be closed by either increasing trade or decreasing trade. (If two countries stop trading, the bilateral balance is by definition zero.) It is much better to close a bilateral trade gap by increasing the exports from the deficit country to the surplus country than for the surplus country to reduce its exports to the deficit country.
- ◆ It is conventional wisdom that reducing a bilateral trade surplus per se, for example, by increasing exports from the deficit country to the surplus country, cannot change the aggregate trade deficit with the world of the deficit country, nor increase the GDP of the deficit country.
- ◆ However, this is not necessarily true because markets are not complete. There is no long-term futures market beyond a couple of years. The insurance markets are also not complete--there are many risks that cannot be insured in an economically viable way. The market, left to its own, may not bring about some otherwise productive economic activities. Thus, coordination (or some would say managed trade or planning) can enable certain economic activities to take place that otherwise would not have occurred.

Coordinated Expansion of Trade

- ◆ An example is the possible development of the natural gas reserves in Alaska to be sold to Chinese customers. Significant long-term investments will have to be made. Without committed buyers, the project cannot be financed (future markets for natural gas does not go beyond a couple of years). Without committed and well-capitalised developers with a track record, the potential buyers will not commit either.
- ◆ Moreover, there is always the concern that the trade may be interrupted for political reasons by either government. Thus, coordination by state and non-state actors are necessary.

Coordinated Expansion of Trade

- ◆ Two sources of potential U.S. exports to China that can be huge and are relatively uncontroversial are agricultural commodities and energy. China has a huge demand for agricultural commodities, and, in addition, there is also great potential for the U.S. to increase the value-added content of U.S. agricultural exports, for example, by producing and exporting meat (beef, pork and poultry) instead of feed grains (corn and soybeans) to China. In 2017, China imported more than US\$115 billion of agricultural commodities, but only 20 percent of the imports came from the U.S. Moreover, Chinese imports of agricultural commodities has been increasing by more than 10 percent per year. Thus, there is the potential of U.S. exports of agricultural commodities to China rising from the current US\$20 billion plus a year to US\$50 billion a year in three to five years, on the basis of new as well as higher value-added U.S. production. The U.S. has significant surplus production capacity (for example, it has an abundance of land, water and pastures) for agricultural commodities if there is assured long-term demand.

Coordinated Expansion of Trade

- ◆ There is also a huge and growing Chinese demand for energy, especially relatively clean energy, which can be met by exports of liquefied natural gas (for example, from Alaska) and shale oil, which are again new production, from the U.S. In 2016, China imported a total of US\$117 billion of crude oil and US\$9 billion of natural gas. Chinese imports of oil and gas from the U.S. was minuscule, at US\$0.2 billion and US\$0.08 billion respectively. Given China's huge and growing demand for energy, and especially for non-polluting energy such as natural gas, and the U.S. being transformed into a net energy exporter because of its rising shale oil and gas production, it is entirely possible for the U.S. to become a top energy exporter to China, gradually increasing to US\$50 billion a year or more, again based on new production and not the diversion of existing production, thus increasing U.S. GDP and employment.

Coordinated Expansion of Trade

- ◆ Thus, it is easy to envisage that additional exports in the agriculture and energy areas alone can amount to more than US\$100 billion a year, with almost 100 percent U.S. value-added content. Moreover, these increased exports are likely to persist for a long time.
- ◆ The beauty of this type of arrangements is that no one is hurt economically. In the U. S., the new exports consists of new domestic supply that already has its committed export demand, so that it will not drive up or drive down prices or otherwise affect the markets. In China, not only are the imports likely to be less expensive than the cost of domestic production on the margin, they serve the important purpose of meeting the expanded and expanding domestic demand, without affecting the prices in the domestic markets. So, all in all, this is likely to be win-win all around.

Coordinated Expansion of Trade

- ◆ One may raise the question: if such profitable opportunities for trade exist, why has the trade not occurred already? The answer lies in the fact that the creation of genuine new export supply requires investment, and investment can be justified only if the production (and export) activities can be sustained over time. That is why a new committed long-term demand for the good to be exported is necessary in order that there is new production.
- ◆ However, new long-term demand can arise only if there is new long-term supply and vice versa. There is therefore the need for the coordination of both the supply and the demand sides. But markets are incomplete, especially futures markets. For example, it is impossible, or prohibitively expensive, to either sell or buy beef or wheat on the futures market for delivery twenty years from the present (actually even three years from the present). Thus one cannot rely on the free markets alone for such long-term trade arrangements involving new supply and demand. Non-market coordination becomes necessary because of the incompleteness of markets. There must be long-term supply and demand contracts for the new production and export to happen.

Coordinated Expansion of Trade

- ◆ Can “managed trade” change the aggregate trade balance?
- ◆ The conventional wisdom takes the aggregate output of each economy as given so that given the savings-investment gap, reallocation of trade flows among trading partners cannot change the aggregate trade balance.
- ◆ However, to the extent that a “managed trade” agreement leads to new output being produced from previously idle resources, it can increase both GDP and employment, as well as exports. Thus, the aggregate trade balance will be improved in the positive direction. One way to think about it is that there is an autonomous increase in permanent supply in response to an exogenous increase in permanent demand.

Enhancing Mutual Economic Interdependence

- ◆ The problem with a trade war is that there are no real winners—both countries lose because the feasible choices open to each of them are reduced.
- ◆ Exporters in both countries will be hurt because of the reduction in their exports, and importers in both countries will see their businesses decline. And the consumers and producers who rely on imported goods and inputs in both countries will have to pay higher prices.
- ◆ A better way to narrow the U.S. trade deficit with China is for the U.S. to increase its exports of goods and services to China, especially newly created goods and services, for example, by exporting newly developed liquefied natural gas from Alaska and shale oil and shale gas from the continental U.S. and producing and exporting meat (beef, pork and poultry) instead of feed grains (corn and soybeans) to China. Such trade should be structured so that it is reliable, sustainable and long-term.

Enhancing Mutual Economic Interdependence

- ◆ Long-term bilateral trade can enhance mutual trust, and mutual trust in turn can promote more long-term bilateral trade.
- ◆ Both countries should therefore promote greater mutual economic interdependence so that their economic relations are win-win making a real war between them unthinkable.
- ◆ The two European powers, France and Germany, which were at one time rivals, fought three wars between them in 1870, 1914 and 1939 respectively. After World War II, the European Common Market was launched so as to increase the degree of economic collaboration and cooperation between them. Today, France and Germany and the best of allies in the European Union, and a war between them is not possible.

Concluding Remarks

- ◆ Even though the direct real impacts of the China-U.S. trade war are relatively small and manageable for the Chinese economy, the uncertainty that it has created, and the negative influence it has on public confidence and expectations, have also affected investment and consumption and hence the real economy.
- ◆ Regardless of whether China and the U.S. can reach an agreement, once it is settled one way or the other, it will at least eliminate the uncertainty. And firms and households can make their investment and consumption decisions accordingly.
- ◆ The Chinese Government is expected to implement cuts in its tax rates, including the value-added tax, corporate and individual income tax, social insurance contribution rates, and continue investing in basic infrastructure projects such as high-speed railroads and urban mass-transit systems. Additional investments in public goods provisions such as environmental preservation, protection and restoration are also possible, especially if an agreement fails to materialise as expected.
- ◆ The Chinese economy grew 6.3% in 2019H1, it should be able to achieve a real rate of growth of at least 6% for 2019 as a whole.

Concluding Remarks

- ◆ The competition between China and the U.S., whether friendly or unfriendly, can be assumed to be an ongoing and long-term one. It is the “new normal”. The trade dispute is only a symptom of the potential possible conflicts between the two countries.
- ◆ Prof. Graham Allison, of the Kennedy School of Government at Harvard University, has written about the inevitability of a China-U.S. war. As a rising power challenges the dominance of an established power, the established power is likely to respond with force. He refers to this “inevitability” as the “Thucydides Trap”, drawing on the book by Thucydides, History of the Peloponnesian War.
- ◆ However, the rise of the former Soviet Union between the end of the Second World War and 1990 provides a counter-example that an established power and a rising power must go to war. The truth is that a thermonuclear war today is so devastating that there are effectively no real winners.

Concluding Remarks

- ◆ To reduce the probability of an armed conflict between China and the U.S. down the road, China-U.S. relations must be carefully managed going forward. Both countries should try to promote greater mutual economic interdependence, to make their relations win-win, so that a war between them would be unthinkable, just as another war between France and Germany, which fought three wars between them, in 1870, 1914 and 1939, is not possible today.
- ◆ It is likely that the China-U.S. trade negotiations will be stretched out, perhaps with an interim “understanding”. I believe a complete rupture of the China-U.S. relation is unlikely as the U.S. still needs Chinese cooperation on such issues as North Korean denuclearisation and large U.S. corporations still have significant interests in the large and growing Chinese market. China also needs the U.S. to continue to supply critical semi-conductors and semi-conductor manufacturing equipment.

Concluding Remarks

- ◆ President Donald Trump is focused solely on his re-election in 2020. Signing an agreement with China may expose him to attacks by his Democratic opponent(s). There are also people inside and outside the U.S. Government who do not want to have an agreement. Dragging things out is not such a bad strategy because it shows that he is tough on China and that he will not hesitate to walk away from a “bad deal”. No one will attack him openly for no agreement. Also, continuing to talk can help to keep the stock markets afloat.
- ◆ President XI Jinping is also not likely to accept any terms that appear to infringe on Chinese sovereignty because it may arouse domestic discontent and possible opposition. Accepting U.S. terms under duress also creates moral hazard and encourages similar behaviour in the future.
- ◆ Moreover, the Chinese side is also concerned about the possibility of imposition of last-minute additional conditions by the U.S. as in the Trump-Kim summit in Hanoi. In addition, if even Kim Jong-Un can refuse to accept last-minute U.S. conditions, it is most unlikely that President XI Jinping will be willing or able to accept them.

Concluding Remarks

- ◆ A fundamental problem is that while economic globalisation enhances the welfare of every country in the aggregate, it has also created “winners” and “losers” in every country. The exporters and importers and their employees and suppliers are the winners. The investors and workers in the domestic industries being replaced by imports are the losers.
- ◆ The market, on its own, does not compensate the losers. That is why there has been so much anger in the U.S., the U.K. and in Europe. It is up to each government to compensate the losers by taxing directly and indirectly the winners. This has not been done in most countries.
- ◆ China, however, has done so through its programmes for the eradication of poverty. It has lifted 740 million people out of poverty. By 2020, poverty in China, as measured by 2010 standards, will have been totally eradicated.

Concluding Remarks

- ◆ In the long run, if China and the U.S. cooperate and work together, many global problems such as prevention of climate change, denuclearisation, and the economic development of Africa, can be solved.
- ◆ China and the U.S. can both collaborate and compete in finding cures for diseases such as cancer and Alzheimer's disease, and every country in the world will benefit from it.
- ◆ The U.S. can invite China to participate in the exploration of Mars and share in the cost, which has been estimated to be hundreds of billions of U.S. dollars.
- ◆ If the two countries compete in a friendly way, much innovation is possible, as in the competition to build the fastest super-computer. The two countries should aim to become **competitive partners!**