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Consumption in Asia

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Abstract

This paper examines consumption patterns in Asia. The majority of Asian countries, in particular, those located in East Asia, such as China, are characterized by high GDP shares of consumption. While over the past two decades there has been a remarkable growth in consumption, and to a lesser extent of consumption per capita, the GDP share of consumption has declined by a considerable amount in Asia. The paper presents projections of the GDP consumption share. The projections are based on time series models and an econometric model that relates the GDP share of consumption to PPP GDP per capita growth. Instrumental variables estimates show that the GDP share of consumption is significantly negatively related to growth: a decrease in PPP GDP per capita growth of 1 percentage point per annum increases the GDP share of consumption by around 2 percentage points. Slower growth in Asia would thus significantly contribute to a higher GDP share of consumption in that region.

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1. Introduction

Consumption as a share of GDP has declined in Asia over the past two decades, see Figure 1. In the beginning of the 1990s, private plus public (total) consumption comprised about 73 percent of GDP. By 2010 that number was around 62 percent. The bulk of the 11 percentage points decline in the GDP share of total consumption occurred during the 2000s. During that decade the GDP share of total consumption declined in Asia by around 9 percentage points. In East Asia the GDP share of total consumption was around 70 percent throughout the 1990s; during the 2000s there was a decline in that variable of around 11 percentage points. By the end of the 2000s the GDP share of total consumption was less than 60 percent in East Asia. That is a small number by international comparison. In South Asia the GDP share of total consumption was around 73 percent in 2010. In South Asia total consumption as a share of GDP declined during the past two decades by around 15 percentage points. The current level of the GDP share of total consumption in South Asia is not unusually low by international comparison: it is of similar size as the GDP share of total consumption in Europe or the group of OECD countries excluding Japan and South Korea.

The purpose of this paper is twofold. The first contribution is to examine trends in consumption for Asia, South Asia, and East Asia, as well as for selected countries of interest such as China, India, and Japan. The trend analysis shows that, during the past two decades, there has been a downward trend in the GDP share of total consumption in Asia. This is due to a strong downward trend in the GDP share of private consumption, but not public consumption. The analysis also shows that private consumption, and to a lesser extent, private consumption per capita, are on an upward trend in Asia. This is important to keep in mind, as it suggests that living standards are improving throughout Asia.

The paper's second contribution is to estimate the effect of PPP GDP per capita growth on the consumption share. An issue with estimating this effect is that variation in the consumption share may affect GDP growth. In order to address this issue, the paper reports instrumental variables

estimates. The instrument for PPP GDP per capita growth is the growth rate of an international commodity net-export price index. This index captures variations in countries' terms of trade that are driven by variations in the international commodity prices.

Instrumental variables estimates show that GDP per capita growth has a significant negative effect on the GDP share of consumption: An increase in PPP GDP per capita growth of 1 percentage point per annum leads to a decrease in the GDP share of total consumption of around two percentage points. This is a quantitatively large effect. Other empirical studies, see, for example, Loayza et al. (2000) find that a higher GDP per capita growth rate has a significant positive effect on the saving rate as implied by the estimates reported in this paper; however the estimated effects of Loayza et al. are (in absolute size) somewhat smaller than those reported in this paper.[1]

Based on the instrumental variables estimates, the paper provides projections of changes in consumption shares during the 2010s under alternative growth scenarios. The main message of these projections is that it would require a substantial decrease in PPP GDP per capita growth in East Asia for consumption shares to increase in the region and be on par with those of other regions. For example, should growth in China decrease from an average of 10 percent per annum during the 2000s to an average of 5 percent per annum during the 2010s then the GDP share of consumption is projected to increase in that country by around 10 percentage points between those two decades.

Other factors, such as changes in demographics, in particular, aging of the population and trends in gender ratios, may affect the GDP share of consumption. Aging of the population can have an indirect effect on the saving rate through GDP growth (aging of the population implies that, ceteris paribus, there are fewer people who work and this slows down growth) and a direct effect (the conventional view is that retired people draw on savings to finance consumption). Kim and Lee (2007) examine the effect of aging in the population for 10 East Asian countries during 1981 to 2003. Based on panel vector autoregressions they find that increases in the dependency ratio lead to

1 Brueckner et al. (2016) provide a theoretical model that provides a rationale for why economic growth may have a positive effect on the saving rate.

decreases in GDP per capita growth, the saving rate, and the GDP ratio of the current account. Their findings suggest that population aging of East Asian countries will lead to increases in the GDP share of consumption in the future. As the authors acknowledge the magnitude of the effect will depend on how economies adapt to the population aging; e.g. the retirement age may be adjusted in which case the effect of aging on saving will be muted.

Chamon and Prasad (2010) find that in China during 1995-2005 young and old households have higher saving rates than mid-aged households. This casts some doubt on the hypothesis that aging of the population will lead to substantial decreases of the saving rate in China. Chamon and Prasad find limited consumption smoothing over the life cycle in their sample. The authors argue that the presence of borrowing constraints and the rise in costs of education and health care are responsible for the high saving rates of the young and old. The authors combine estimates based on household data with macro data and find only a modest role for projected changes in the age structure of the population on future household saving rates in China.

Wei and Zhang (2011) examine the relationship between household saving rates and gender imbalances in China. They note that since the late 1990s there has been a significant increase in the ratio of males to females in the marriage-age cohort. Wei and Zhang argue that people save in order to improve their prospects in the marriage market, in particular, families with sons. Wei and Zhang's estimates suggest that between 1990-2007 up to half of the increase in the household saving rate in China is accounted for by the change in the sex ratio.

Horioka and Terada-Hagiwara (2011) present projections of saving rates for twelve economies in emerging Asia. For the period 2011-2030, the authors project that saving rates in these countries will not change much on average. The authors argue that the negative effect of aging of the population on saving rates will be offset by a positive effect of higher GDP per capita. Horioka and Terada-Hagiwara's estimates show a significant negative effect of aging of the population on the saving rates. The coefficients on (the square of) GDP per capita is significantly negative

(positive). Horioka and Terada-Hagiwara also include in their model the GDP share of domestic credit to the private sector (and its square); however, the estimated coefficients on these variables are individually not significantly different from zero at the conventional significance levels. The projections in Horioka and Terada-Hagiwara (2011) do not take into account that slower growth leads to a decrease in saving rates (as shown by the instrumental variables estimates reported in this paper and Loayza et al., 2000).[2]

2. Stylized Facts

During the past two decades the decline of Asia's GDP share of total consumption is mostly due to the decline of the GDP share of private consumption. The decline of the GDP share of public consumption is relative small. This can be seen from Figures 2 and 3. The GDP share of public (government) consumption was around 18 percent in Asia in 1990; by 2010 it was only slightly below 18 percent. In South Asia the GDP share of public consumption declined by around 4 percentage points between 1990 and 2010, while in East Asia there was a modest increase of around 2 percentage points during that time period. But these changes are relatively small when compared to the changes in the GDP share of private consumption. In Asia the GDP share of private consumption decreased between 1990 and 2010 by around 10 percentage points. In East Asia the decrease during that time period was around 13 percentage points while in South Asia the GDP share of private consumption decreased by around 10 percentage points.

During the past two decades, China's GDP share of private consumption declined by over 25 percentage points. In 1990 the GDP share of private consumption in China was around 56 percent – 5 percentage points larger than in Japan, where at that time the GDP share of private consumption was around 51 percent. Japan's GDP share of private consumption increased throughout the past two decades significantly. In 2010 the GDP share of private consumption in Japan was around 58

2 The projections are based on the model of column (7) of Table 2 (Horioka and Terada-Hagiwara, 2011).

percentage points. In terms of levels one can see from Figure 2 that the private consumption share of Asia's two largest economies (Japan and China) is significantly below that of the United States where private consumption makes up around 70 percent of GDP. In 2010 China's GDP share of private consumption was around 31 percent -- 28 percentage points below that of Japan and less than half the United State's GDP share of private consumption.

In Japan there was a significant increase of the GDP share of public consumption during 1990-2010. In 1990 Japan's GDP share of public consumption was around 12 percent; by 2010 that figure had increased by 6 percentage points to 18 percent. At the beginning of the 1990s Japan's GDP share of public consumption was similar to the United States; and it was about 10 percentage points lower than in China. By 2010 Japan's GDP share of public consumption was similar to China and about 6 percentage points higher than in the United States.

An important point to note is that private consumption increased in Asia during the 1990s and the 2000s (see Figure 4). In PPP terms, nearly 6 trillion USD worth of goods were consumed by the private sector in Asia in 1990. By 2010 that figure had more than doubled, reaching about 13 trillion USD. To appreciate how large that increase is note that private consumption in the United States – the largest economy in the world -- in 1990 was around 6 trillion USD. That is, the increase in private consumption in Asia over the past two decades exceeds the private consumption of the United States in 1990. About half of the increase in private consumption in Asia materialized in East Asia. Between 1990 and 2010 private consumption increased in East Asia by around 4 trillion USD, from 4 trillion USD to 8 trillion USD. These number imply that, in just two decades, private consumption doubled in East Asia. In South Asia the rate of increase in private consumption is even larger. In 1990 private consumption in South Asia was around 1 trillion USD; by 2010 that number had tripled to 3 trillion USD.

Despite the decline in the GDP share of private consumption, there was a significant increase in private consumption in China. Private consumption in China doubled during 1990-2010,

reaching about 3 trillion USD in 2010. Private consumption in China in 2010 exceeded private consumption in Japan by nearly 1 trillion USD. But private consumption in China is still significantly below that of the United States: In 2010 private consumption in the United States was nearly 10 trillion USD.

There has been a tremendous increase in national income of Asian economies (Figure 5). Between 1990-2010 the PPP GDP of Asia increased by a factor of three. In 1990 the total national income of Asian economies was around 10 trillion USD. By 2010 it was around 30 trillion USD. The rate of growth of national income was slightly higher in South Asia than East Asia. East Asia had an average per annum growth rate of GDP of around 8 percent during 1990-2010. East Asia's PPP GDP in 1990 was around 7 trillion USD; two decades later PPP GDP was around 20 trillion USD. In South Asia per annum growth of GDP was around 8.5 percent during 1990-2010. South Asia's PPP GDP in 1990 was around 1.5 trillion USD; two decades later PPP GDP was around 5.3 trillion USD.

China's national income growth during 1990-2010 is remarkable. In 1990 PPP GDP was around 2.5 trillion USD; by 2010 more than 8 trillion USD were added. In per annum terms this implies a growth rate of PPP GDP of around 16 percent. By the mid-1990s China's PPP GDP exceeded that of Japan. In 2010 PPP GDP of China was about 7 trillion USD higher than in Japan. The gap between PPP GDP between the United States and China was around 5 trillion USD in 1990. By 2010 that gap had narrowed to about 2 trillion USD.[3]

About 1 billion people were added to Asia's population between 1990 and 2010 (Figure 6). In 1990 the population of Asia was around 3 billion. This implies a per annum population growth rate of around 1.5 percent during 1990-2010. East Asia's population grew at a rate of about 1 percent per annum while in South Asia population growth was around 2.1 percent during that period. In 2010 about 1.6 billion people lived in South Asia; in East Asia it were about 2 billion.

3 Note that in constant price USD (i.e. without the PPP adjustment) Japan's GDP exceeded that of China. This is shown in Appendix Figure 1.

China's population growth during 1990-2010 was less than 1 percent per annum. During that period the population increased in China by about 0.2 billion; from about 1.1 billion in 1990 to about 1.3 billion in 2010. China's population is about five times that of the United States. In the United States population growth during 1990-2010 was around 0.1 percent per annum. In population terms, India is Asia's second largest country. India's population in 1990 was around 0.9 billion; in 2010 it was around 1.2 billion. This implies a per annum population growth rate of around 2 percent.

Living standards, as measured by PPP private consumption per capita, have increased in Asia during 1990-2010 (Figure 7). Asia's PPP private consumption per capita was around 1900USD in 1990. Two decades later that number had increased to about 3300USD. Per annum growth of PPP private consumption per capita in Asia during 1990-2010 was about 4 percent per annum. PPP private consumption per capita growth was lower in East Asia than South Asia. In East Asia PPP private consumption per capita grew by about 3.5 percent per annum during 1990-2010. In 1990 PPP private consumption per capita in East Asia was around 2300USD; in 2010 it was around 4000USD. In South Asia PPP private consumption per capita grew at about 6 percent per annum during 1990-2010. In 1990 PPP private consumption per capita in South Asia was around 900USD; in 2010 it was around 2000USD.

In terms of levels of private consumption per capita, the largest economies of Asia are trailing far behind the United States. In Japan PPP private consumption per capita was around 18000USD in 2010. In that year PPP private consumption per capita was around 31000USD in the United States. Japan's PPP private consumption per capita grew during 1990-2010 by around 2 percent per annum. During that time period PPP private consumption per capita in the United States grew at about the same rate as Japan. This is remarkable as GDP growth in Japan was significantly less than in the United States. In China PPP private consumption per capita grew at about 4 percent per annum during 1990-2010. In 1990 PPP private consumption per capita was around 1300USD in

China; in 2010 that number was around 2400USD. Despite the decrease in the GDP share of private consumption in China, living standards increased significantly in that country during the past two decades.

3. Econometric Analysis

3.1 Trends in Consumption

This section estimates trends in consumption shares for Asia and various countries in the region that are of particular interest. The focus is on the past two decades: 1990-2010. The estimates can be thought of as trends in GDP consumption shares over the medium run. Under the assumption that these trends prevail during the 2010s, one can use these estimates to project consumption shares for 2020.

Table 1 presents estimates of a linear trend model of the GDP share of private consumption. Column (1) shows estimates for Asia; column (2) East Asia, and column (3) South Asia. One can see that the estimated trends are negative and significantly different from zero at the 1 percent significance level in all three columns. Quantitatively, the largest negative trend is in East Asia. In that region, the GDP share of private consumption declined by nearly 0.6 percentage points per annum. The linear trend model does a reasonable job in predicting the GDP share of private consumption towards the end of the sample, i.e. the 95% confidence interval of the predicted GDP share of private consumption in 2010 overlaps with the actual GDP share of private consumption in 2010.

Table 2 shows estimates of the linear trend model for the GDP share of total consumption. Similar to the previous table, one can see that the estimated coefficient on the linear trend is negative and significantly different from zero at the conventional significance levels. The region with the largest negative trend in the GDP share of total consumption is South Asia. In that region

total consumption as a share of GDP declined by over 0.7 percentage points per annum during 1990-2010. In East Asia the GDP share of total consumption declined during that period by around 0.5 percentage points per annum. The larger decline of the GDP share of total consumption in South Asia reflects a significantly larger decline in the GDP share of public consumption in the that region during 1990-2010.

Table 3 shows estimates of the linear trend model for the GDP share of total consumption for China, India, and Japan. In China and India there was a significant negative trend in the consumption share during 1990-2010: the GDP share of total consumption declined in China by around 1.5 percentage points per annum; for India, the decline is around 0.8 percentage points per annum. In Japan the GDP share of total consumption has a significant positive trend during 1990-2010: On average the GDP share of total consumption increased in Japan by around 0.7 percentage points per annum.

One can use the estimates of the linear trend model to make future projections. Of course, there is no guarantee that the trend in the GDP share of consumption will prevail in the future. (The next paragraph will elaborate on this point.) Table 4 shows projections of the GDP share of total consumption for the year 2020 that are based on the estimates of the linear trend model reported in Table 2. For Asia the linear trend model projects a GDP share of total consumption for the year 2020 of around 59 percent. This is 3 percentage points lower than the GDP share of total consumption in Asia in 2010. For East Asia the linear trend model projects a GDP share of total consumption for the year 2020 of around 57 percent; for South Asia the projection is 65 percent. The linear trend model's projection for the 2020 GDP share of total consumption is 2 percentage points below the 2010 GDP share of total consumption in East Asia, and 8 percentage points below the 2010 GDP share of total consumption in South Asia.

One reason to be somewhat sceptical of the projections based on the linear trend model is that medium-run trends in consumption shares can change. Japan is a suitable case study to

illustrate that point. Figure 8 shows a time-series graph of the GDP share of total consumption in Japan over half a century. (1960-2010 is the longest period given the availability of data from the PWT.) One can see two distinct trends: pre-1990 and post-1990. In the three decades during 1960-1990 the estimated trend in the GDP share of total consumption is negative; around 0.4 percent per annum. The three decades during 1960-1990 were characterized by high PPP GDP per capita growth, around 5 percent per annum on average. The post-1990 period was characterized by low PPP GDP per capita growth, around 1 percent per annum on average. These numbers suggest that medium-run trends in consumption shares can change, and that they may be (negatively) related to GDP growth. The next section will explore whether GDP growth has an effect on consumption shares using an econometric model.

3.2 Economic Growth and the Consumption Share

Table 5 presents instrumental variables estimates of the effect of PPP GDP per capita growth on the GDP share of total consumption. The instrument is the growth rate of an international commodity net-export price index, *ComPI Growth*. The variable is constructed as sum of the growth rates of international commodity prices multiplied with countries' lagged GDP shares of net-exports of the relevant commodity bundle (the data are from World Bank, 2016). Growth in international commodity prices affect countries' GDP growth differentially depending on whether countries are net-exporters or importers of a commodity and how large the commodity exports or imports are relative to GDP.

The instrumental variables estimates show that GDP growth has a significant negative effect on the GDP share of consumption. Column (1) of Table 5 shows estimates for the largest possible sample given available data from the Penn World Table and World Development Indicators. From column (1) one can see that the coefficient on PPP GDP per capita growth is around -2 and has a

standard error of around 0.3. The hypothesis that this coefficient is equal to zero can be rejected at the 1 percent significance level. One can interpret the estimated coefficient as a one percentage point increase in GDP growth leading a decrease in the GDP share of total consumption of around 2 percentage points. Columns (2) and (3) restrict the sample to countries in Asia and East Asia. One can see that the coefficient on GDP growth continues to be around -2. This is also the case for the sub-sample of East Asian countries that excludes China and Japan, see column (4).

The estimated effect of GDP growth on the GDP share of total consumption can be used to generate predicted differences for specific countries and time periods of interest. One comparison that is interest is between the United States and China during the 2000s. Table 6 reports the relevant numbers. China's average GDP share of total consumption during that decade was around 62 percent; for the United States that number was around 83 percent. China's average per annum growth rate of PPP GDP per capita during the 2000s was around 10 percent while for the United States that number was around 1 percent. The difference in PPP GDP per capita growth during the 2000s between China and the United States was around 9 percentage points. According to the estimates of the econometric model, the prediction is that the GDP share of total consumption in the United States should be around 18 percentage points higher than in China. From the 95% confidence interval reported in column (3) of Table 6, one can see that as an upper bound the model predicts that the difference in the GDP share of total consumption between the United States and China should is 23 percentage points; the lower bound is 13 percentage points. The actual difference between the United States and China of the GDP share of total consumption is around 21 percentage points. Differences in PPP GDP per capita growth during the 2000s thus contributed significantly to the difference in the GDP share of total consumption between these two countries.

Another interesting comparison can be made for China between the 1990s and the 2000s. In the 1990s China's GDP share of total consumption was around 74 percent; PPP GDP per capita growth was around 6 percent per annum. Between the 2000s and the 1990s the GDP share of total

consumption decreased in China by around 12 percentage points; the growth rate increased by around 4 percentage points per annum. According to the estimates shown in Table 5, the econometric model predicts that the GDP share of total consumption decreased between the 1990 and the 2000s by around 8 percentage, see Table 7. From the 95% confidence interval reported in column (3) of Table 7, one can see that as an upper bound the model predicts that the difference in China's GDP share of total consumption between the 1990s and the 2000s is as large as 10 percentage points; the lower bound is 6 percentage points. This suggests that between the 1990s and the 2000s the increase in GDP growth in China contributed significantly to the decrease in the GDP share of total consumption in that country.

Table 8 provides projections of changes in the GDP share of total consumption between the 2000s and the 2010s. The projections are made for alternative growth scenarios. Scenario 1 is based on a PPP GDP per capita growth rate of 5 percent per annum. This corresponds to the average growth rate of East Asia during the 2000s, and is about 1 (5) percentage point(s) lower than the average growth rate of South Asia (China) during that period. Under this growth scenario, the projection is that the GDP share of total consumption will increase in China by around 10 percentage points; the upper bound of the 95% confidence interval for this projection suggests that the GDP share of total consumption may increase in China by as much as 13 percentage points while the lower bound of the confidence interval suggests that the GDP share of total consumption will increase in China by, at least, 7 percentage points. In South Asia the projected change in the GDP share of total consumption is more modest: under a growth scenario of 5 percent per annum, the GDP share of total consumption is projected to increase in South Asia by around 2 percentage points; the 95% confidence for this projection gives an upper bound of a change in the GDP share of total consumption of 3 percentage points and a lower bound of 1 percentage point. Note that under Scenario 1 growth in East Asia is the same during the 2010s as during the 2000s. If one believes that 5 percent growth is a reasonable growth scenario for China during the 2010s then -- in

order for growth of 5 percent to materialize in East Asia during that decade -- the growth of other East Asian economies has to increase between the 2000s and the 2010s to compensate the slowdown in growth of the Chinese economy.

The second scenario is a PPP GDP per capita growth rate of 3 percent per annum. This corresponds roughly to the growth rate of OECD countries during the 2000s if one excludes the years of the financial crisis. Under this growth scenario, the GDP share of total consumption is projected to increase in East Asia by 4 percentage points. For South Asia the GDP share of total consumption is projected to increase by 6 percentage points. And in China – should such an unlikely growth scenario be realized – the projection is that the GDP share of total consumption increases by around 14 percentage points. The upper bound of the 95% confidence intervall for the change in the GDP share of total consumption is 18 percentage points for China, 5 percentage points for East Asia, and 8 percentage points for South Asia; the lower bound values are 10, 3, and 4 percentage points, respectively.

The third scenario is a PPP GDP per capita growth rate of around 1 percent per annum. This could be called a "doomsday" scenario: 1 percent per annum was the PPP GDP per capita growth rate of Japan during the Lost Decades. Under this growth scenario the projection is that the GDP share of total consumption will decline in East Asia by around 8 percentage points; for South Asia the decline is larger, around 10 percentage points. To be frank: for China, going from 10 percent per annum average growth during the 2000s to 1 percent per annum average growth during the 2010s is highly unlikely, but should such a scenario occur then the model predicts that China's GDP share of total consumption will decline by around 18 percentage points.

4. Conclusion

In order to stabilise the debt-to-GDP ratio, a decrease in GDP growth implies that for a given stream

of public expenditures tax revenues have to increase. If the GDP share of consumption increases, as predicted by the paper's model under a scenario of a decrease in GDP growth, then fiscal authorities may want to consider increasing taxes on consumption: When the GDP consumption share increases the base on which a consumption tax is imposed becomes larger (relative to the base on investment and exports). For the purpose of raising tax revenues, the tax mix should take into account the size of the base on which each tax is levied.

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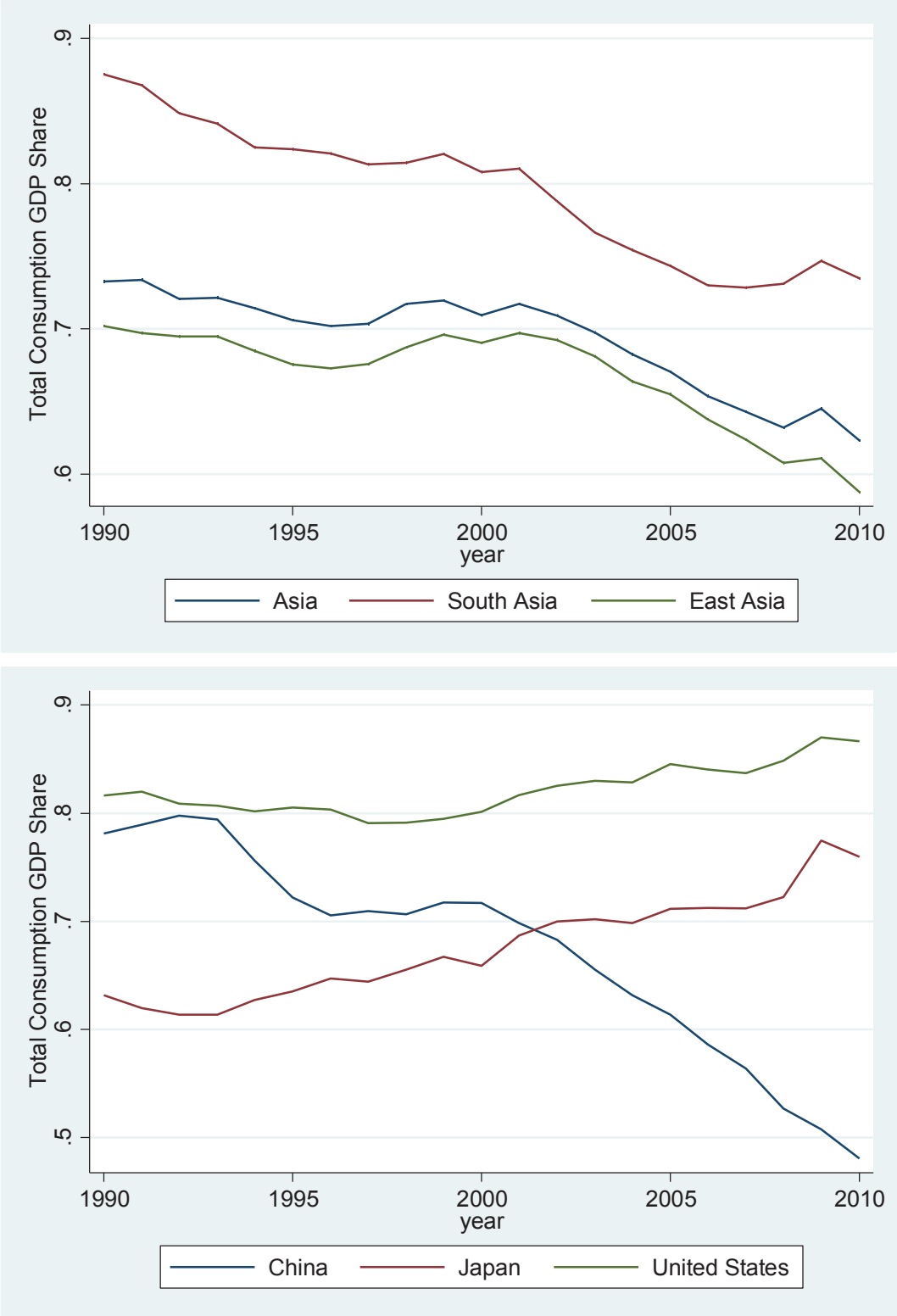
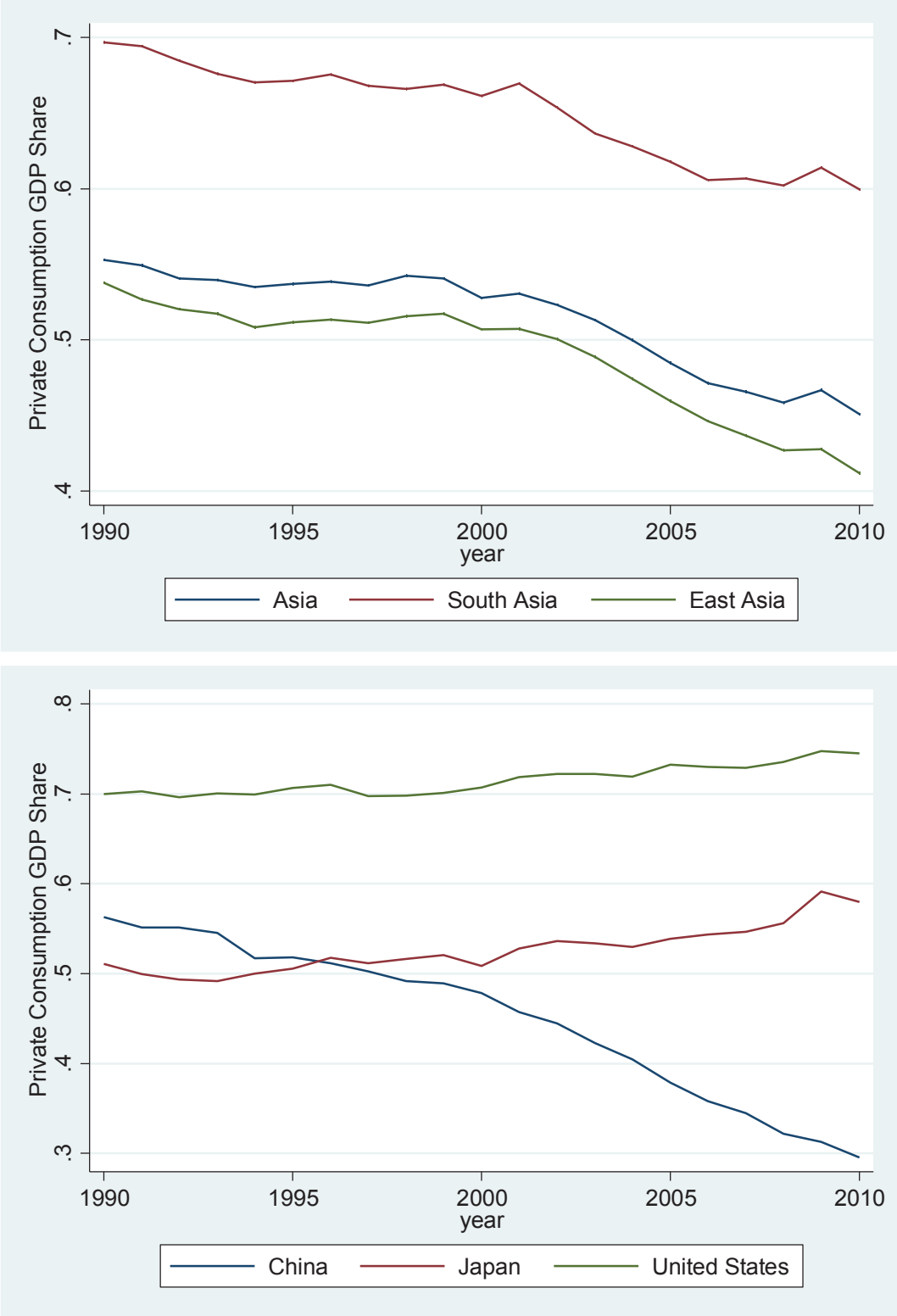
Figure 1. Total Consumption Share of GDP



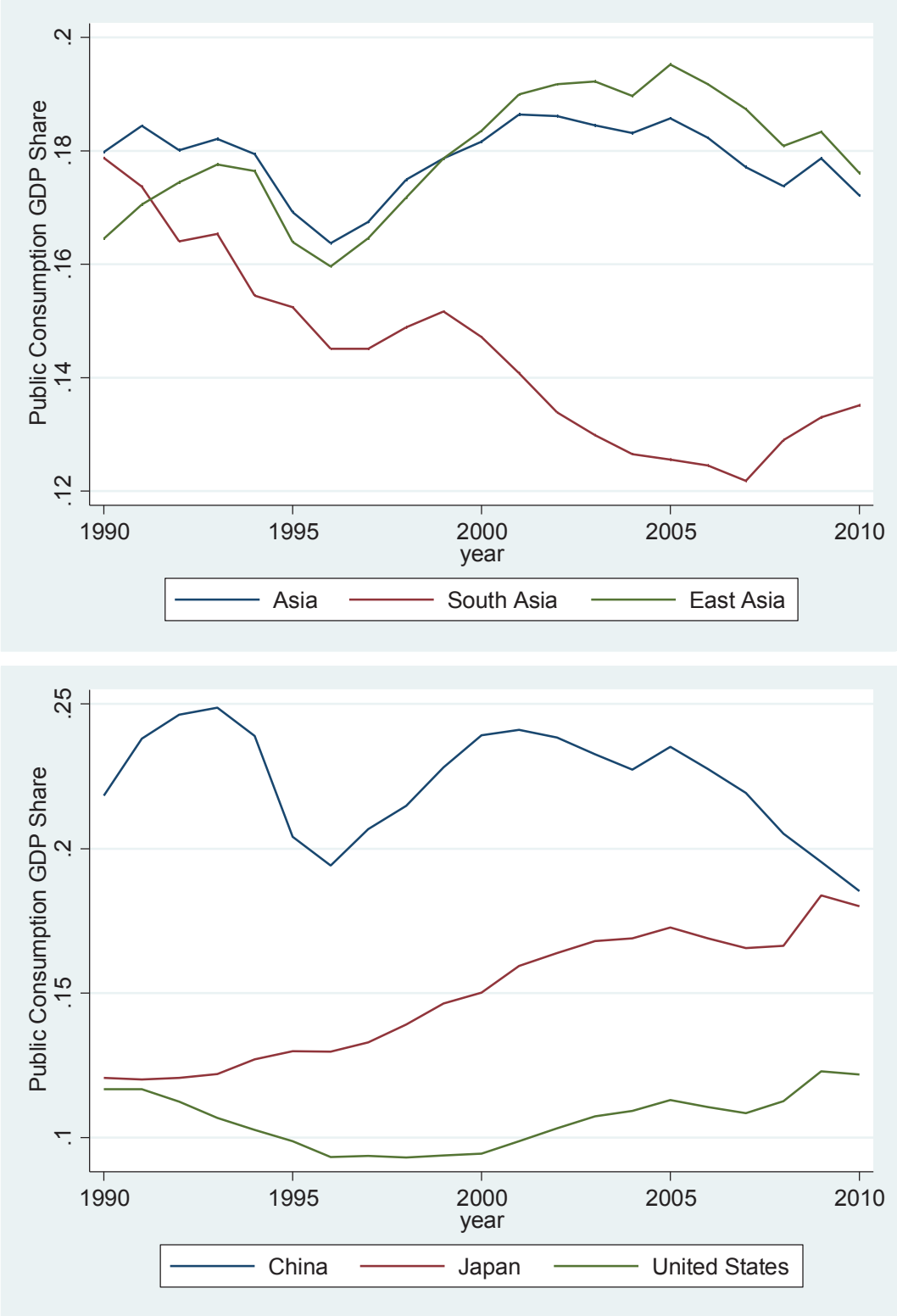
Note: The data source is the Penn World Table, Feenstra et al. (2013).

Figure 2. Private Consumption Share of GDP



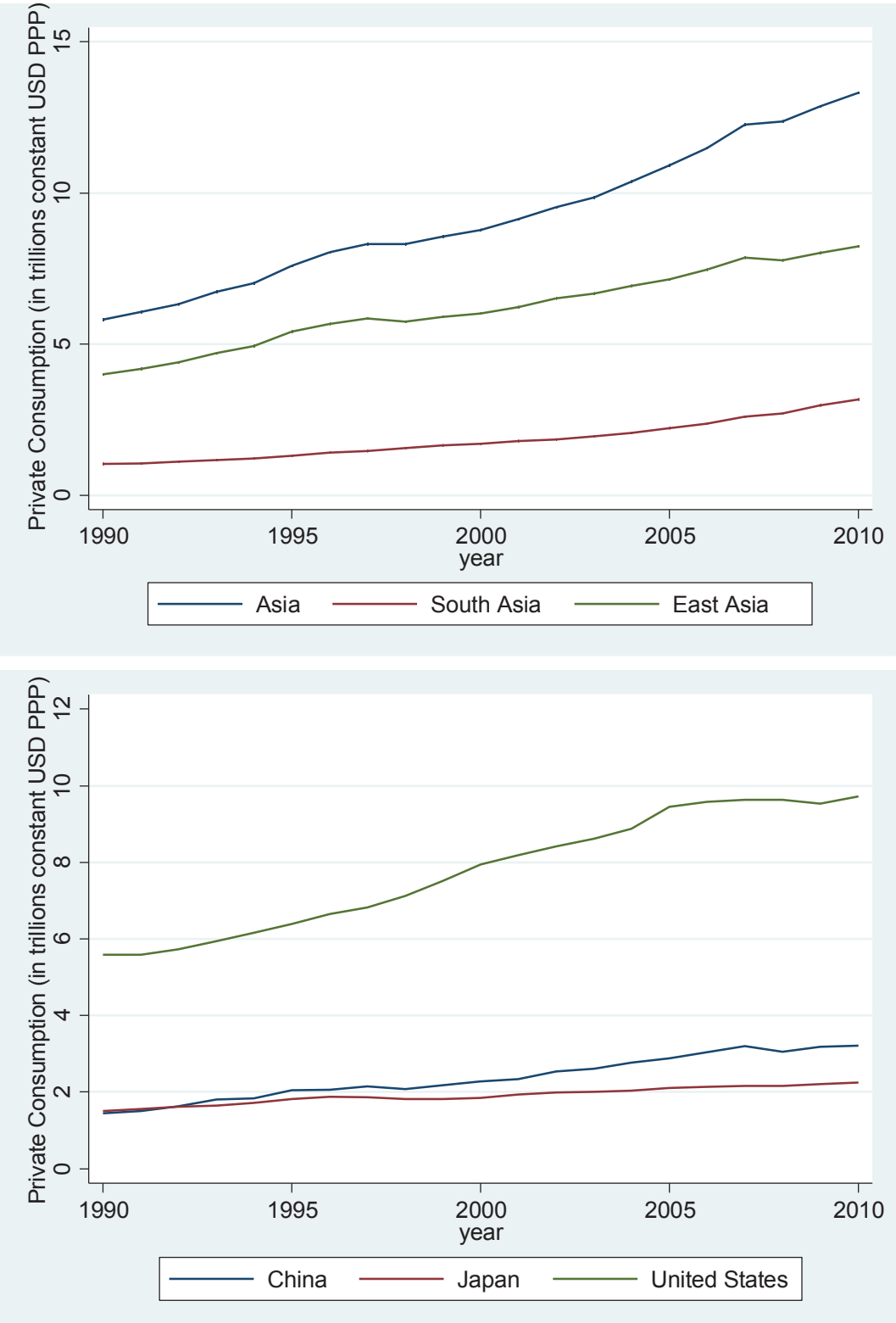
Note: The data source is the Penn World Table, Feenstra et al. (2013).

Figure 3. Public Consumption Share of GDP



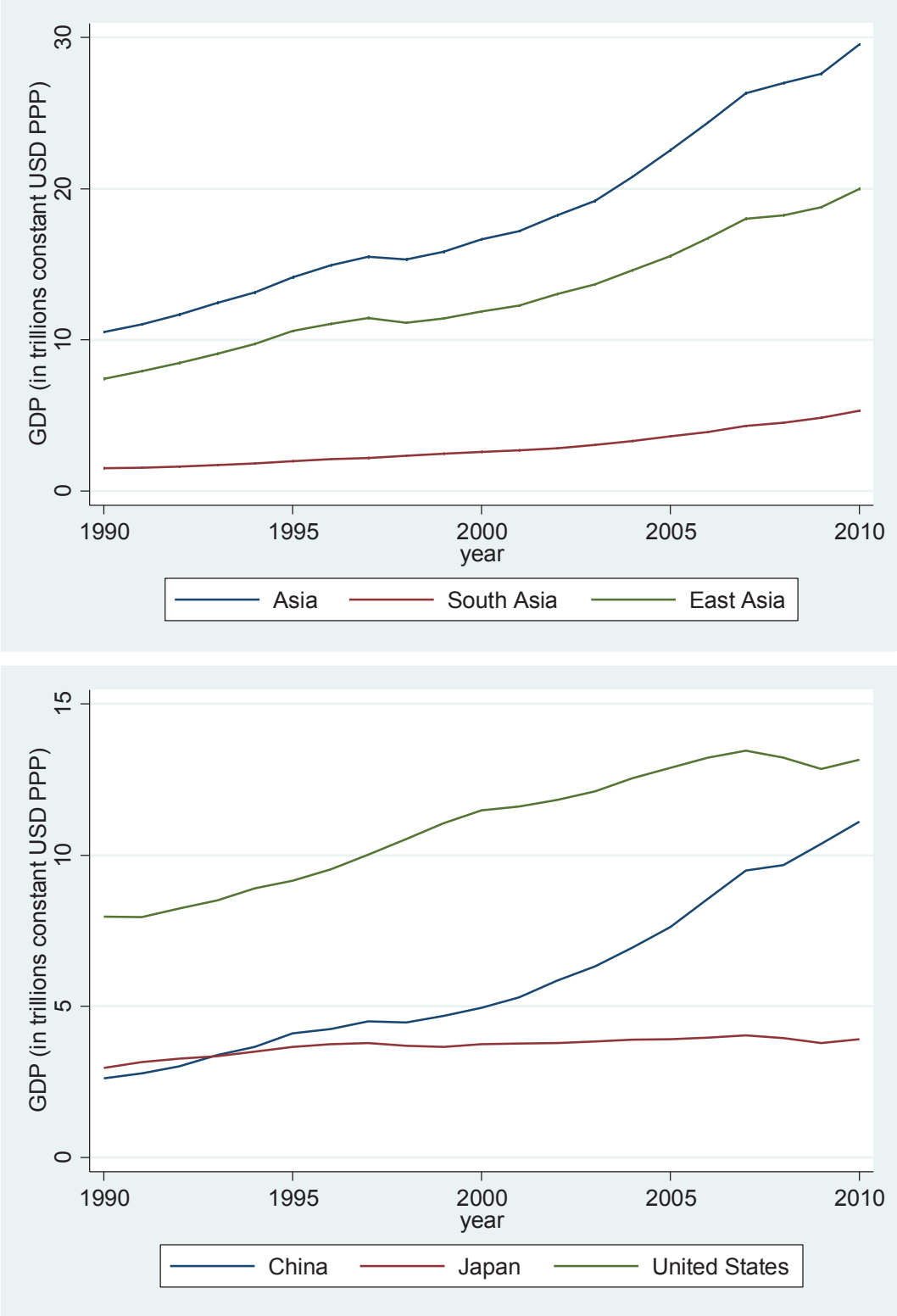
Note: The data source is the Penn World Table, Feenstra et al. (2013).

Figure 4. Private Consumption



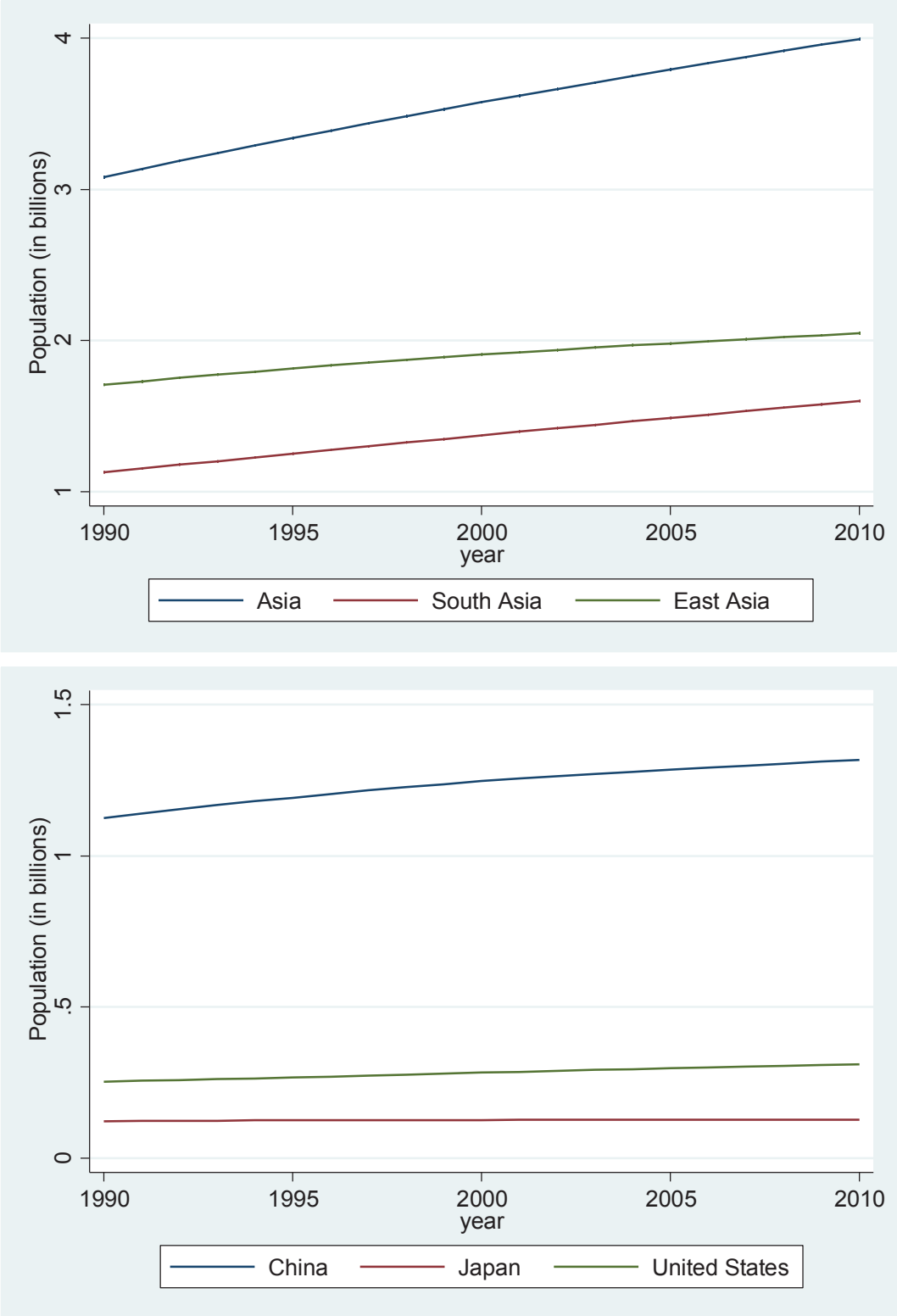
Note: The data source is the Penn World Table, Feenstra et al. (2013).

Figure 5. GDP



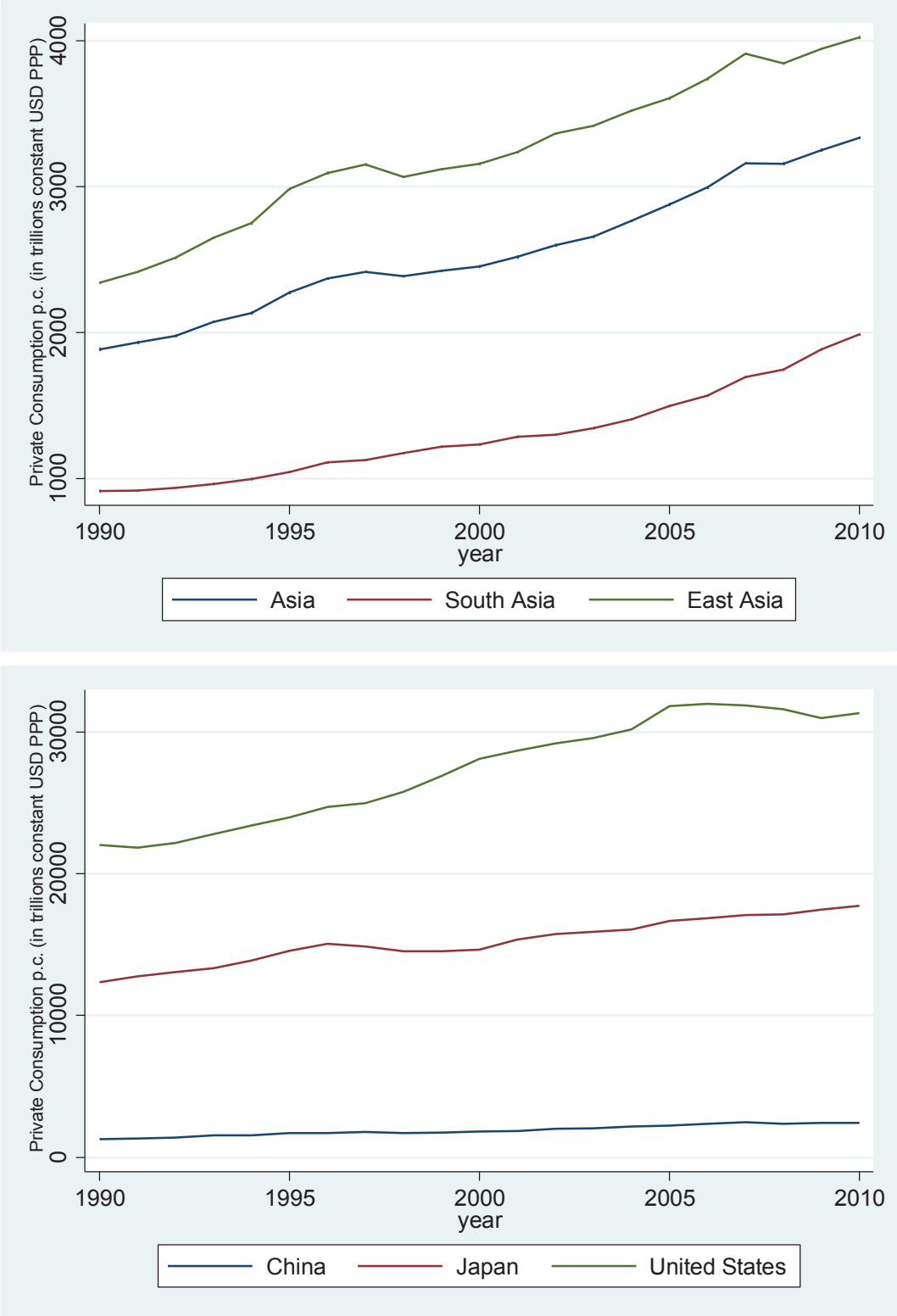
Note: The data source is the Penn World Table, Feenstra et al. (2013).

Figure 6. Population Size



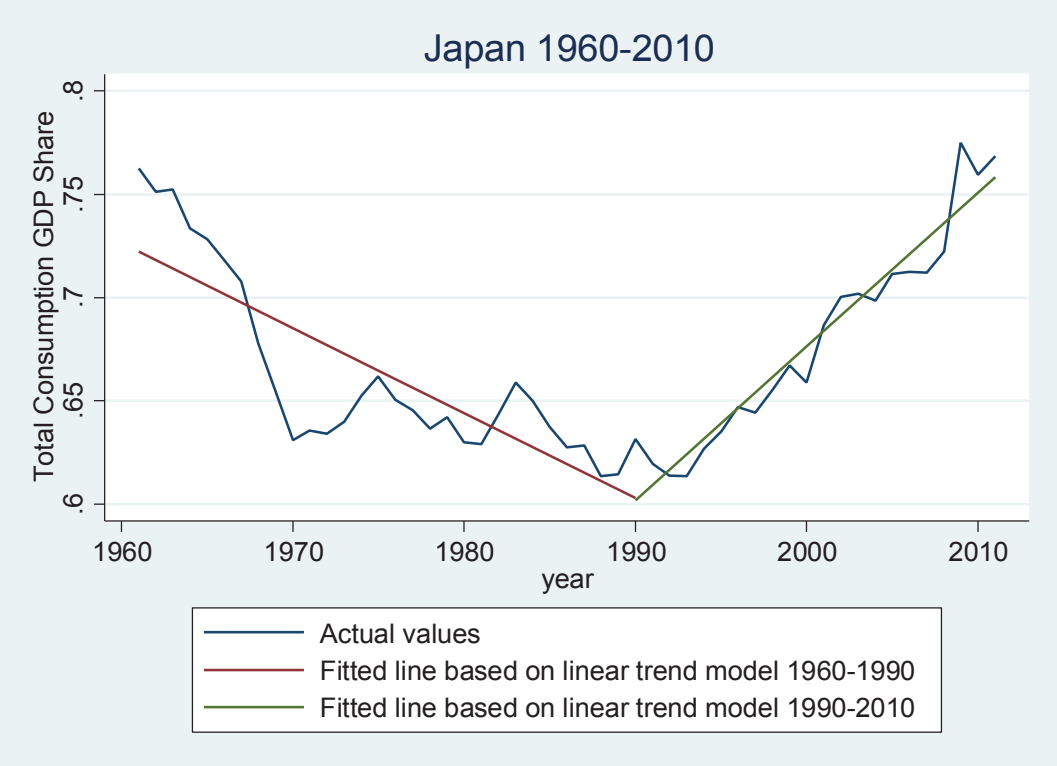
Note: The data source is the Penn World Table, Feenstra et al. (2013).

Figure 7. Private Consumption per capita



Note: The data source is the Penn World Table, Feenstra et al. (2013).

Figure 8. Trends in the Total Consumption Share of GDP in Japan over Half a Century



Note: PPP GDP per capita growth during 1960-1989 was 5 percent per annum; during 1990-2009 it was 1 percent per annum. The data source is the Penn World Table, Feenstra et al. (2013).

Table 1: Linear Trend Model (1990-2010) of Private Consumption Share

Private Consumption Share

	Asia	East Asia	South Asia
	Panel A: Estimated Model		
Coefficient (Standard Error) Intercept	0.56 (0.01)	0.55 (0.01)	0.70 (0.00)
Coefficient (Standard Error) Time Trend, per annum percent effect	-0.50 (0.04)	-0.57 (0.05)	-0.49 (0.03)
	Panel B: Predicted Consumption Share in 2010		
Predicted GDP Share of Private Consumption in 2010	0.46	0.43	0.60
95% Confidence Interval	[0.44 ; 0.48]	[0.41 ; 0.45]	[0.59 ; 0.62]
	Panel C: Actual Consumption Share in 2010		
Actual GDP Share of Private Consumption in 2010	0.45	0.41	0.60

Note: The data source is the Penn World Table, Feenstra et al. (2013).

Table 2: Linear Trend Model (1990-2010) of Total Consumption Share

	Asia	East Asia	South Asia
	Panel A: Estimated Model		
Coefficient (Standard Error) Intercept	0.74 (0.01)	0.71 (0.01)	0.87 (0.01)
Coefficient (Standard Error) Time Trend, per annum percent effect	-0.49 (0.05)	-0.45 (0.07)	-0.73 (0.04)
	Panel B: Predicted Consumption Share in 2010		
Predicted GDP Share of Total Consumption in 2010	0.64	0.62	0.72
95% Confidence Interval	[0.62 ; 0.66]	[0.59 ; 0.65]	[0.70 ; 0.74]
	Panel C: Actual Consumption Share in 2010		
Actual GDP Share of Total Consumption in 2010	0.62	0.59	0.74

Note: The data source is the Penn World Table, Feenstra et al. (2013).

Table 3: Linear Trend Model (1990-2010) of Total Consumption Share

Selected Countries in Asia

	China	India	Japan
	Panel A: Estimated Model		
Coefficient (Standard Error) Intercept	0.82 (0.01)	0.86 (0.01)	0.60 (0.01)
Coefficient (Standard Error) Time Trend, per annum percent effect	-1.48 (0.10)	-0.82 (0.05)	0.73 (0.07)
	Panel B: Predicted Consumption Share in 2010		
Predicted GDP Share of Total Consumption in 2010	0.51	0.69	0.76
95% Confidence Interval	[0.46 ; 0.56]	[0.67 ; 0.71]	[0.73 ; 0.79]
	Panel C: Actual Consumption Share in 2010		
Actual GDP Share of Total Consumption in 2010	0.48	0.71	0.76

Note: The data source is the Penn World Table, Feenstra et al. (2013).

Table 4. Linear Trend Model Projected Consumption Shares in 2020

	Asia	East Asia	South Asia
Projected GDP Share of Total Consumption in 2020	0.59	0.57	0.65
Actual GDP Share of Total Consumption in 2010	0.62	0.59	0.74
Difference Between Projection to 2020 and Actual GDP Share in 2010	-0.03	-0.02	-0.08

Note: The projections are based on the estimates of Table 2.

Table 5. Effects of GDP Growth on the Consumption Share

Dependent Variable is:	GDP Share of Total Consumption (in percent)			
	(1)	(2)	(3)	(4)
	World	Asia	East Asia	East Asia excl. China & Japan
GDP p.c. Growth (in percent)	-2.03	-2.11	-2.24	-2.34
	(0.30)	(0.40)	(0.63)	(0.61)
		First Stage ComPI Growth		
ComPI Growth	0.86	0.93	0.76	0.77
	(0.18)	(0.21)	(0.33)	(0.34)
Cragg Donald F-Stat	207	88	13	13
Observations	5463	1350	516	424
Countries	136	37	12	10

Note: The method of estimation is two-stage least squares. Standard errors (shown in parentheses) are Huber robust and clustered at the country level. The data source from GDP per capita and the consumption share is the Penn World Table, Feenstra et al. (2013). *ComPI* is an international commodity net-export price index. The index is computed as geometric average of international commodity price indices weighted with countries one-period lagged net-export GDP share of the relevant commodity basket. These data are from the World Development Indicators, World Bank (2016).

Table 6. Difference in Consumption Share and GDP Growth Between China and the United States During 2000s

	(1) Actual Difference Between China and United States	(2) Predicted Difference Between China and United States	(3) 95% Confidence Interval of Predicted Difference
Average GDP Share of Total Consumption	-21	-18	[-13 ; -23]
Average per annum PPP GDP per capita Growth	9		

Note: the value in column (2) is based on the values in column (1) of this table and the estimated coefficient on GDP growth (-2) in column (1) of Table 5, i.e. -18=9*-2.

Table 7. Difference in GDP Growth and the Consumption Share in China Between the 1990s and 2000s

	(1) Actual Difference Between 1990s and 2000s	(2) Predicted Difference Between 1990s and 2000s	(3) 95% Confidence Intervall of Predicted Difference
Average GDP Share of Total Consumption	-12	-8	[-6 ; -10]
Average per annum PPP GDP per capita Growth	4		

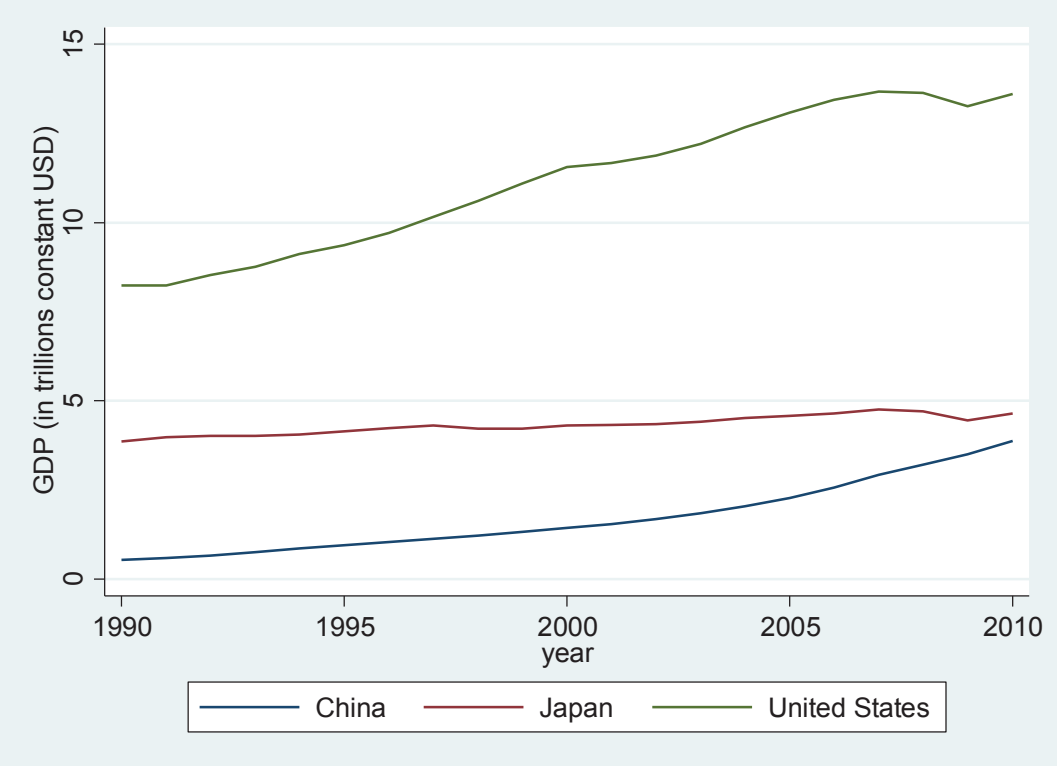
Note: the value in column (2) is based on the values in column (1) of this table and the estimated coefficient on GDP growth (-2) in column (1) of Table 5, i.e. -8=4*-2.

Table 8. Projected Changes in Total Consumption Shares Between 2000s and 2010s for Alternative Growth Scenarios

	China	East Asia	South Asia
	Scenario 1: PPP GDP per capita Growth During 2010s of 5 Percent Per Annum		
Projected Change in GDP Share of Total Consumption Between 2000s and 2010s	10	0	2
95% Confidence Interval	[7 ; 13]	[0 ; 0]	[1 ; 3]
	Scenario 2: PPP GDP per capita Growth During 2010s of 3 Percent Per Annum		
Projected Change in GDP Share of Total Consumption Between 2000s and 2010s	14	4	6
95% Confidence Interval	[10 ; 18]	[3 ; 5]	[4 ; 8]
	Scenario 3: PPP GDP per capita Growth During 2010s of 1 Percent Per Annum		
Projected Change in GDP Share of Total Consumption Between 2000s and 2010s	18	8	10
95% Confidence Interval	[13 ; 23]	[5 ; 11]	[7 ; 13]

Note: The values of the projected changes in GDP shares of total consumption shares between the 2000s and the 2010s for scenarios 1, 2, 3 are computed as the difference between PPP GDP per capita growth during the 2010s -- for the respective growth scenarios -- and a reference PPP GDP per capita growth rate, multiplied with the estimated coefficient on PPP GDP per capita growth (-2) in column (1) of Table 5. The reference per annum PPP GDP per capita growth rate is 10 percent for China, 5 percent for East Asia, and 6 percent for South Asia; these numbers are the respective average per annum growth rates during the 2000s.

Appendix Figure 1. GDP in USD



Note: The data source is the World Development Indicators, World Bank (2016).