UNITED NATIONS CONFERENCE ON TRADE AND DEVELOPMENT

DISCUSSION PAPERS

GLOBAL REBALANCING: EFFECTS ON TRADE FLOWS AND EMPLOYMENT

No. 200
September 2010

UNITED NATIONS

GLOBAL REBALANCING: EFFECTS ON TRADE FLOWS AND EMPLOYMENT

Jörg Mayer

No. 200
September 2010

Acknowledgements: An earlier draft of this paper was part of the author's input to UNCTAD's Trade and Development Report 2010. The author is grateful to Jörg Bibow, Alfredo Calcagno, CP Chandrasekhar, Heiner Flassbeck, Jayati Ghosh, Detlef Kotte, Sheila Page, Ugo Panizza, John Weeks, Adrian Wood and seminar participants at the ILO in Geneva and at Oxford University for discussion and comments on earlier drafts. Juan Pizarro provided excellent research assistance. Alicia Rapin also helped with the data. The opinions expressed are solely those of the author and do not necessarily reflect the views of UNCTAD or its Member States.

UNCTAD/OSG/DP/2010/4

The opinions expressed in this paper are those of the author and are not to be taken as the official views of the UNCTAD Secretariat or its Member States. The designations and terminology employed are also those of the author.

UNCTAD Discussion Papers are read anonymously by at least one referee, whose comments are taken into account before publication.

Comments on this paper are invited and may be addressed to the authors, c/o the Publications Assistant, Macroeconomic and Development Policies Branch (MDPB), Division on Globalization and Development Strategies (DGDS), United Nations Conference on Trade and Development (UNCTAD), Palais des Nations, CH-1211 Geneva 10, Switzerland (Telefax no: +41 (0)22 917 0274 / Telephone no: +41 (0)22 917 5896). Copies of Discussion Papers may also be obtained from this address.

UNCTAD Discussion Papers are available on the UNCTAD website at http://www.unctad.org.

JEL classification: F4, O11, J23

Contents

Page

Abstract 1

I. INTRODUCTION 1

II. CONSUMPTION SPENDING IN THE UNITED STATES AND CHINA 3

A. United States consumption spending 3

B. China's consumption spending 5

III. THE TRADE IMPACT OF CONSUMPTION SPENDING IN THE UNITED STATES AND CHINA 11

IV. THE ACCUMULATION OF GLOBAL IMBALANCES: INCOME, TRADE AND EMPLOYMENT EFFECTS IN DEVELOPING COUNTRIES 15

V. THE POTENTIAL IMPACT OF A GLOBAL REBALANCING ON TRADE FLOWS AND EMPLOYMENT IN DEVELOPING COUNTRIES 20

VI. CONCLUSIONS 28

ANNEX 1 30

ANNEX 2 34

REFERENCES 37

List of tables

1 GTAP simulation results of the impact of rebalancing in China and the United States on trade flows and factor prices, selected countries and country groups 21

2 GTAP simulation results for changes in sectoral trade balance, selected countries and country groups 23

3 GTAP simulation results for changes in sectoral employment, selected countries and country groups 25

A1 GTAP simulation results of the impact of rebalancing in China on trade flows and factor prices, selected countries and country groups 32

List of figures

1 Personal consumption in the United States, 1950–2010 4

2 Household liabilities, disposable personal income and labour compensation in the United States, 1965–2009 5

3 Household consumption in China, Japan and the Republic of Korea from start of economic take-off 6

4 Share of gross fixed capital formation in GDP in China, Japan and the Republic of Korea from start of economic take-off 7

5 Household consumption, employee compensation, corporate profits and disposable incomes of households and firms in China, 1993–2007 8

6 China's labour force by age structure, 1990–2050 10

7 Household consumption in selected countries and country groups, average for 2007–2008 12

8 Current-account balance and trade balance by end-use category in the United States, 1980–2009 13

9 Percentage of similarity in the composition of consumer good imports of selected countries with the imports of the United States, 1992–2008 14

10 Growth rates of world trade by sector, 1995–2002 and 2002–2008 16

11 Per capita output by sector, selected countries and country groups, 1995–2008 18

12 Average sectoral shares in total value added and employment, selected countries and country groups, 1995–2008 19

13 Labour intensity and GTAP simulation results for changes in world exports by industrial sector caused by rebalancing in the United States and China 24

14 Labour intensity and GTAP simulation results for changes in world exports by industrial sector caused by rebalancing in the United States, China and Germany 27

GLOBAL REBALANCING: EFFECTS ON TRADE FLOWS AND EMPLOYMENT

Jörg Mayer
United Nations Conference on Trade and Development (UNCTAD)
(joerg.mayer@unctad.org)

Abstract

Medium-terms shifts in the structure of world demand affect the sectoral composition of domestic output, trade and employment. A sustained reduction of global current-account imbalances implies a decline in the share of household consumption in aggregate demand in the United States and the opposite development in China. The net effect of these adjustments for the world economy would be deflationary and yet insufficient for the unwinding of global imbalances. It would also cause sizeable adverse employment impacts in the world economy as a whole. A multilaterally coordinated rebalancing that would also include an increase in the share of household consumption in aggregate demand of developed country surplus economies would reduce these adverse effects. Apart from the countries undertaking rebalancing, developing countries in East and South-East Asia are likely to face the greatest adjustment pressure from global rebalancing.

I. INTRODUCTION

The persistently large imbalances in the world economy – with sizeable current-account deficits in some countries, particularly the United States, and sizeable current-account surpluses in others, notably Germany, Japan, developing countries in East Asia, especially China, and a number of oil-exporting countries – contributed to the outbreak of the current economic and financial crisis and facilitated its global spread.[1] While global imbalances declined in the immediate aftermath of the crisis, they have been widening again with the ongoing recovery of the world economy. Global current-account imbalances are not necessarily undesirable. However, there is widespread agreement that the current imbalances are unsustainable.[2] Hence, a smooth and non-deflationary reduction of global imbalances is indispensable not only for ensuring that the recent global economic upturn

[1] Financial excesses were the eventual trigger of the global financial crisis. However, these excesses would most probably not have developed to the same extent if the macroeconomic environment had not been characterized by large saving-investment imbalances and asset price misalignments. These factors exerted enormous pressure in the United States and the global financial markets where the development of new complex financial instruments and regulatory failures had progressively introduced serious systemic flaws. Regarding the propagation of the financial problems that initially had been confined to the United States financial markets, only a much broader set of interrelated factors, including macroeconomic in addition to purely financial elements, could have been responsible for generating a crisis of these proportions.

[2] The recent accumulation of global imbalances has generally been judged as undesirable not only because of their size but mainly because of the unsustainability of the factors behind them, particularly the massive increase in often debt-financed household consumption in the United States.

continues but also for minimizing the risk of recurrent global economic turmoil. This paper examines the effects on trade flows and employment that global rebalancing might entail.

A correction of current-account imbalances and – their domestic mirror image – the savings-investment disequilibria will change the structure of world demand and affect the sectoral composition of domestic output, trade flows and employment. These changes are driven by: (i) the per capita income levels of those countries that make the greatest contribution to world aggregate demand growth; and (ii) the income distribution in rapidly growing economies and its attendant impact on the role of household consumption in domestic demand growth. These mechanisms are global in scope, covering developed and developing countries, but the paper focuses on the two main protagonists in this story – China and the United States.[3]

Adopting this bipolar perspective appears useful for several reasons. First, the United States and China have accounted for sizeable shares of global imbalances (the United States for about 45 per cent of deficits and China for about 25 per cent of surpluses, respectively, in 2008, i.e. the year when the sum of individual countries' absolute current-account positions reached a post-war peak of over 5 per cent of global GDP (de Mello and Padoan, 2010)). Second, the recent growth trajectories of the United States and China appear to have developed in opposite directions. Consumption as a share of GDP increased in the United States but fell in China; investment rose dramatically in China while its importance shrunk in the United States; and China's trade surplus sharply contrasted with the substantial deficit in the United States. Thus the United States current-account deficit has been associated with a low national savings rate and a continuously rising share of private consumption in GDP, while along with China's current-account surplus there has been a very high national savings rate and a very low share of household consumption in GDP. However, the external position of neither of these two countries is sustainable. Regarding the United States, unless another asset bubble occurs, there is no alternative to de-leverage debt-financed household consumption, and in China, the need to embark on a major structural transformation from investment- and export- to consumer-led growth has been officially recognized.[4]

The main questions addressed in this paper are: (i) how, in the 5-year period before the current crisis began, buoyant consumer demand in the United States and the relative slow expansion of household consumption that accompanied vigorous aggregate growth in China influenced per capita output growth, world trade and employment; and (ii) what would happen to the level and sectoral structure of world trade and employment if the shares of consumption in GDP in the United States and China went back to their historic trends. This set-up is of course simplistic because of lagged effects, path dependence and irreversibility (for example, de-leveraging bad household debt does not simply mean reversing savings ratios), but seems well-suited to indicate the direction of changes and a general idea of the magnitudes involved.

Section 2 examines the development of consumption spending in China and the United States. Section 3 looks at the trade impact of household consumption in these two countries and tries to determine which countries' consumer demand could make up for a decline in United States household consumption. It argues that China's consumer good imports are both too small and too different from that of the United States to be able to compensate the adverse effects of a sizeable decline in United States consumer spending on global consumer good imports. Developed surplus economies, notably Germany and Japan, would be better placed to do so. Section 4 examines development in sectoral per capita output growth, trade and employment during the 5-year period in the build-up to the current crisis when global imbalances were accumulating rapidly. Section 5 simulates the effects on global trade flows and sectoral employment shifts that re-balancing in the United States and China is likely to imply. It shows that the net effect of rebalancing confined to China and the United States for the world

[3] For a general discussion of the issues involved in moving from a current-account surplus to a more balanced external position, see IMF, 2010.

[4] See China's 11th Five Year Plan enacted in 2006.

economy would be deflationary and yet insufficient for the unwinding of global imbalances. Moreover, it would probably cause sizeable adverse employment impacts in the world economy as a whole. A multilaterally coordinated rebalancing that would also include an increase in the share of household consumption in aggregate demand of developed country surplus economies, especially in Germany, would reduce these adverse effects. The concluding section 6 stresses that a global rebalancing requires a multilaterally coordinated approach and raises some questions about the sustainability of the export-led development strategy in East and South-East Asia. Much of this strategy has been based on the participation in value chains in which these countries produce intermediate goods that are finalized in China for export to the United States. Global rebalancing may well reduce the production and export opportunities that these value chains have offered. As a result, developing countries in East and South-East Asia may need to follow economic rebalancing in China and reorient their development strategy towards a greater role of domestic demand as well.

II. CONSUMPTION SPENDING IN THE UNITED STATES AND CHINA

There are three main views on the causes of global imbalances and policies to correct them (for surveys see Mann, 2002 and Yu, 2007). A first international perspective emphasizes the flows and holdings of financial assets and views current-account balance as being determined by the portfolio choices of private financial investors and official reserve holders that drive international capital flows. The most popular expression of this perspective has been the “savings glut” hypothesis (Bernanke, 2005). A second international perspective focuses on flows of trade in goods and services. Exchange rates play a key role in this perspective, in particular alleged “currency manipulation” by China for maintaining an undervalued renminbi. A, third, national perspective examines national income and product accounts, focusing on savings and investment, and sees the current account as driven by national savings-investment imbalances. Contrary to the previous perspective, it sees trade flows driven mainly by relative demand factors, rather than just by relative prices. In other words, it sees international trade in goods and services as responding, in a relatively passive fashion, to domestic demand factors as reflected in national accounts. Cross-country differences in the rate of economic growth play an important role in this perspective.[5]

Each of these three perspectives provides a different basis for analysis, and one or the other perspective may be particularly useful for certain circumstances or time frames. This paper adopts the third perspective which implies that an effective rebalancing of the United States savings-investment balance cannot occur without interrupting the secular decline in its saving rate or, what is equivalent, the secular increase in its consumption rate, and that the opposite holds for surplus countries.

A. United States consumption spending

The secular decline in the United States household savings rate since the beginning of the 1980s went hand in hand with a rapid expansion of private consumption. Since the late 1990s, the share of personal consumption in GDP has considerably exceeded its average long-term trend of about 66 per cent, reaching a peak in early 2009, when it accounted for 71 per cent of GDP (figure 1).

[5] See annex 2 for further discussion of these three perspectives.

Figure 1

PERSONAL CONSUMPTION IN THE UNITED STATES, 1950–2010

(Per cent of GDP)

Source: Author's calculations, based on the United States Bureau of Economic Analysis database.
Note: The observations are based on quarterly data. Data for 2010 refer to the first quarter.

More importantly, the increase in United States household consumption was largely debt financed. Facilitated by easy consumer credit, lax lending standards, a proliferation of exotic mortgage products, the growth of a global market for securitized loans and soaring house values, burgeoning household spending created strongly growing household debt and led to a sharp decline in the United States household savings rate to almost zero.[6] The ratio of debt to personal disposable income reached an all-time high in 2007, exceeding 130 per cent. As a result, household leverage was 27 percentage points above where it would have been had it maintained its 1975–2000 trend (figure 2). This difference, which corresponds to about $2.8 trillion, indicates the potential magnitude of United States household deleveraging that could be achieved through debt reduction and increased savings.

The increase in private consumption was unsustainable because it was not supported by a similar expansion of labour compensation in the private sector. Compared to previous upswings, the economic expansion that ended with the onset of the current crisis had been characterized by a low increase in employment and by the relative stagnation of real wages. As a result, private sector labour compensation grew at an unusually sluggish pace and fell short by more than $800 billion (in real terms) relative to the trajectory of the previous four business cycles (Roach, 2009: 14). Low- and middle-income households that intended to maintain their relative standards of consumption thus turned from income- to debt-financed expenditure. While the share of consumer credit in disposable personal income oscillated around an average of about 18 per cent between the mid-1960s and the mid-1990s, it reached a peak of over 25 per cent in the 2000s due to an average annual rate of growth of consumer credit of 8 per cent between 1992 and 2006 (Barba and Pivetti, 2009: 115). Low interest rates, asset price inflation (first for equities and then for housing) and financial deregulation permitted this shift from wage to non-wage income (i.e. income from property and government transfers) and loans as the sources of purchasing power, used increasingly by low- and middle-income households. Resort to non-wage income allowed households to maintain the share of disposable personal income in GDP at around 74 per cent, despite the long-term decline in the share of labour compensation in GDP since the early 1980s (interrupted by only a brief upswing in the late 1990s) (figure 2). Efforts to maintain relative standards of consumption, despite sluggish growth in labour compensation, led many households to lower their savings or increase their debts, causing a marked fall in the household savings rate.[7]

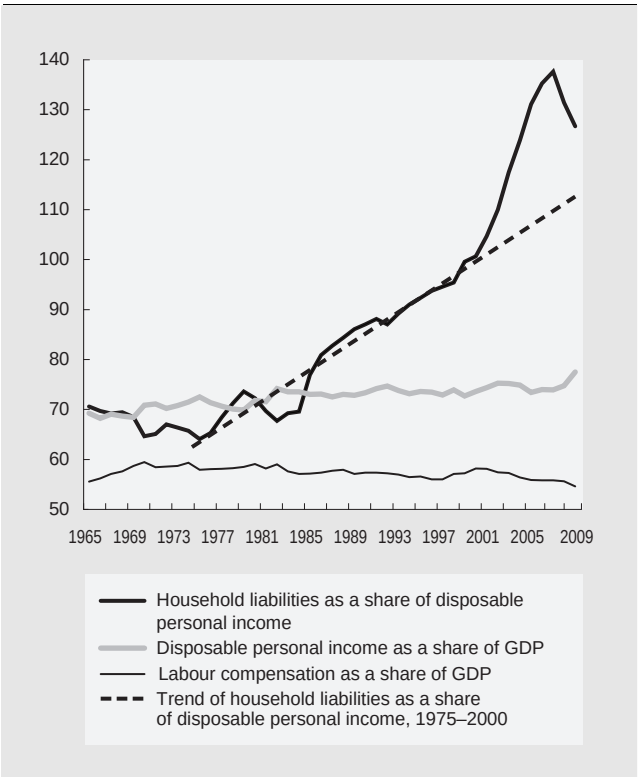
[6] Glick and Lansing (2010) show that large increases in household leverage (as measured by the ratio of debt to disposable personal income) and the housing bubble were not unique to the United States; they also occurred in other developed countries.

[7] For further discussion on the development of income inequality and the relationship between income distribution and the maintenance of relative, rather than absolute, standards of consumption in the United States, see Barba and Pivetti, 2009.

Figure 2

HOUSEHOLD LIABILITIES, DISPOSABLE PERSONAL INCOME AND LABOUR COMPENSATION IN THE UNITED STATES, 1965–2009

(Per cent)



Source: Author's calculations, based on the United States Federal Reserve, *Flow of Funds* database (tables B100, F6 and F7).
Note: Data for 2009 are preliminary.

In the final two quarters of 2008, real personal consumption expenditure fell sharply, marking a departure from the trend of a steady increase in the consumption rate since the 1980s. Thereafter, it picked up again, but this is most likely due to the one-off effects of transfers related to various government programmes such as the "cash-for-clunkers" programme, food stamps and extended unemployment benefits, as well as tax cuts. This suggests the recovery is only temporary. Indeed, there is good reason to believe that the decline in household consumption as a share of GDP has only just begun. It has fallen by only about one percentage point from its peak of 71.5 per cent and, thus, remains about five percentage points above its pre-bubble average of 66 per cent during the period 1975–2000. The decline in asset prices and the associated wealth effects for households, a sharp tightening of credit availability and a large increase in unemployment risk are widely expected to have a lasting downward impact on household spending. According to recent estimates (Lee, Rabanal and Sandri, 2010: 3), the current changes in the respective shares of household consumption and savings in total income are likely to settle at the levels of the early 1990s, which "implies a significantly lower share of private sector demand in GDP by about 3 percentage points compared to the pre-crisis (2003–2007) average".[8]

B. China's consumption spending

Private consumer spending in China is low by international standards, regardless of whether it is measured in per capita terms or as a share of GDP (McKinsey Global Institute, 2009). In 2008, per capita consumption was only $758 (in real 2000 terms), much lower than that of many other developing countries, including in Asia.

However, a low and declining share of private consumption in aggregate demand is a characteristic frequently observed in rapidly industrializing economies during their early phase of economic take-off. The industrialization experiences of Japan and the Republic of Korea indicate that the share of private consumption in GDP tends to fall during about the first 20 years after economic take-off, before turning to a slow upward trend thereafter, and that this may happen in spite of stable positive rates of growth in private consumption expenditure (figure 3). The reason for this is the key

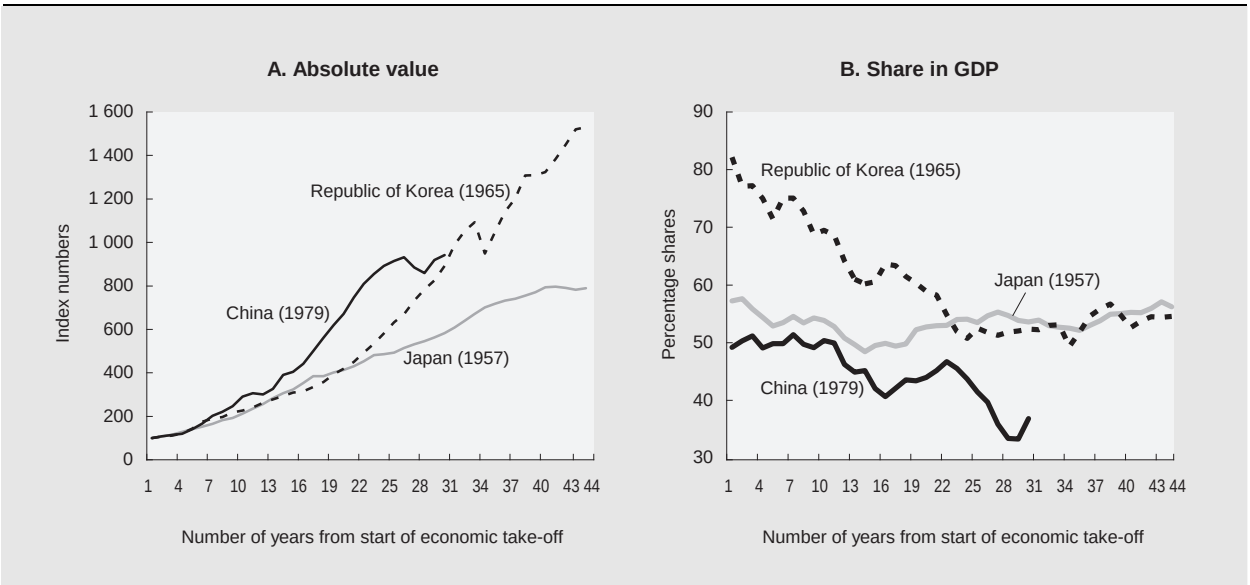
[8] Carroll and Slacalek (2009) use a different simulation model but arrive at similar conclusions. They also note that retail sales have declined particularly sharply, and considerably more than in any previous recession since the Second World War.

importance of capital accumulation for rapid industrialization and the associated high – and initially rising – share of gross fixed capital formation in GDP during economic take-off (figure 4).[9] However, contrary to the experiences in Japan and the Republic of Korea at similar stages of economic take-off, China experienced a sharp decline in private consumption and a sharp increase in investment – both measured as a share of GDP – since about the mid-2000s, which is about 25 years after the country began its economic take-off (figures 3 and 4).

Figure 3

HOUSEHOLD CONSUMPTION IN CHINA, JAPAN AND THE REPUBLIC OF KOREA FROM START OF ECONOMIC TAKE-OFF

(Index numbers on a logarithmic scale, initial year = 100, and percentage shares)



Source: Author's calculations, based on *UNCTAD Handbook of Statistics* database; World Bank, *World Development Indicators*, and *Global Development Finance* database; and Japan, Economic and Social Research Institute (ESRI), *Annual Report on National Accounts of 2010*, Part 1.1.

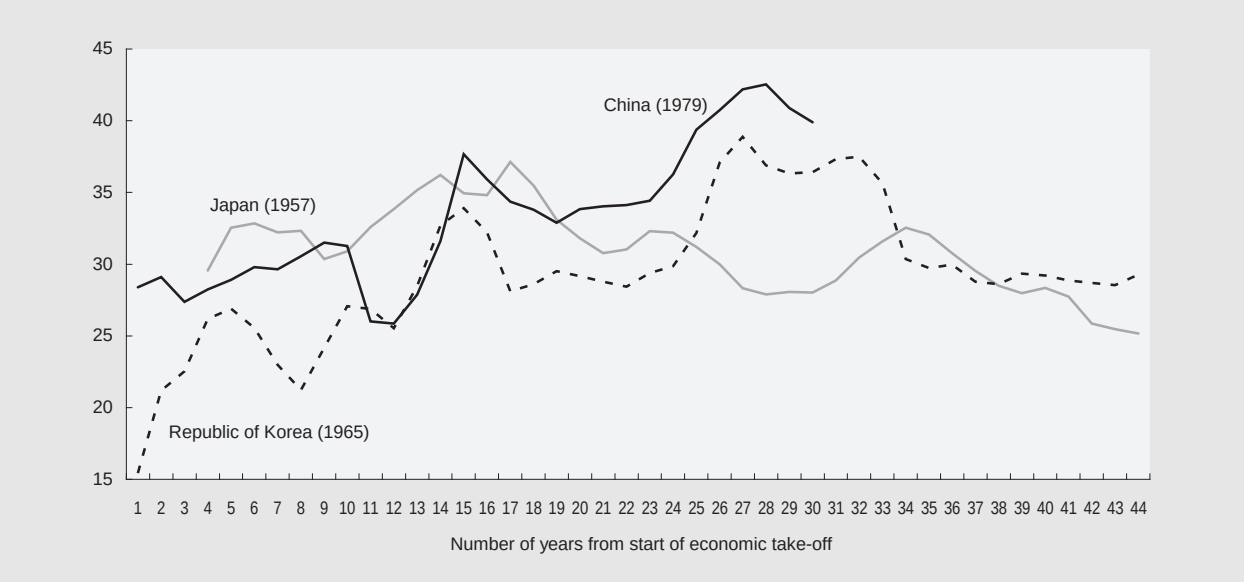
Note: The year in brackets indicates when economic take-off began. For the definition of these dates, see footnote 9.

[9] The dates used here for the beginning of economic take-off were determined through a breakpoint analysis of productivity growth series, measured by growth rates of GDP per worker, as is frequently used in the literature on catching-up and integration (Maury and Pluyaud, 2004; IMF, 2004). This analysis revealed clear starting breakpoints for Japan, the Republic of Korea and China. By contrast, the starting point could not be determined as clearly for India and, for the purpose of this analysis, was taken as 1980. These dates closely correspond to (but do not coincide with) the dates used by the IMF (2005) for growth take-off. However, the IMF-study determines the beginning of economic take-off by the start of an economy's rapid integration into international trade; it is defined by the IMF (2004) as "starting when the three-year moving average of constant-price export growth first exceeded 10 per cent".

Figure 4

SHARE OF GROSS FIXED CAPITAL FORMATION IN GDP IN CHINA, JAPAN AND THE REPUBLIC OF KOREA FROM START OF ECONOMIC TAKE-OFF

(Per cent)



Source: See figure 3.
Note: See figure 3.

In order to explain the two features observed since the mid-2000s with regard to China's private consumption expenditure – its relatively slow growth over the five-year period as a whole, and its declining share in GDP – some observers have focused on the savings behaviour of households. It is argued that households' marginal propensity to save has been high, and has increased further over the past decade because of demographic developments (such as the increase in the proportion of the working age population in total population), reforms of State-owned enterprises since the mid-1990s (which increased many households' uncertainty as to their future pension, health and education expenditures) and the limited provision of health care, education and pensions by the Government (see, for example, Modigliani and Cao, 2004; and Blanchard and Giavazzi, 2006).

These factors are undoubtedly important explanations for the increase in the savings rate of Chinese households (see, e.g., McKinsey Global Institute, 2009). But it is far less likely that they played a major role in the decline of the share of consumption in aggregate demand. Calculations based on regression analysis suggest that the 5 percentage point increase in China's household savings since the early 1990s has been responsible for only one-ninth of the 9 percentage point decline in the share of consumption in GDP that has occurred since then. The same calculations suggest that it is the decline in the share of households' disposable income in GDP that is largely responsible for the relative decline in consumer demand (Aziz and Cui, 2007).

The share of labour income in national income reached a peak in the mid-1990s and has been consistently declining since then.[10] This decline has been closely mirrored by the decline in the share of household consumption in GDP. At the same time, the share of corporate profits in national income has been increasing (figure 5). To be sure, this evidence does not suggest that labour compensation in

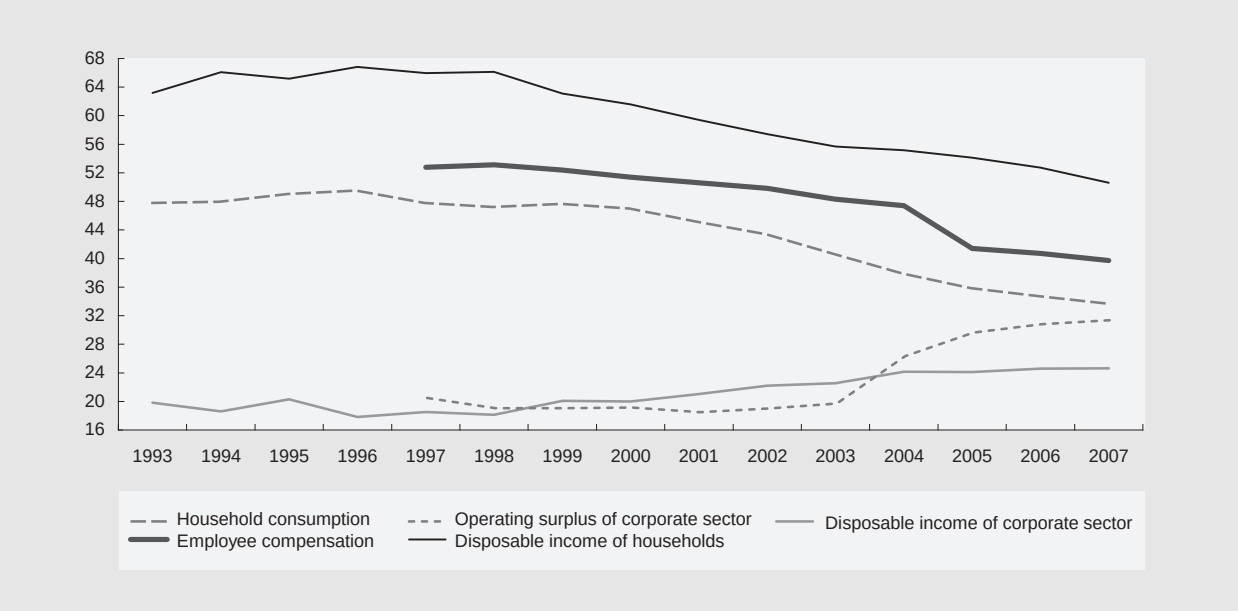
[10] For a detailed discussion of the data issues involved in these calculations, see also Aziz and Cui, 2007.

China has been falling, but only that household income and employee compensation have been growing slower than GDP.[11]

Figure 5

HOUSEHOLD CONSUMPTION, EMPLOYEE COMPENSATION, CORPORATE PROFITS AND DISPOSABLE INCOMES OF HOUSEHOLDS AND FIRMS IN CHINA, 1993–2007

(Per cent of GDP)



Source: Author's calculations, based on National Bureau of Statistics of China database; and Bai and Qian, 2009a: table 4.

At first glance, this evidence would suggest that the low and declining share of household consumption in GDP reflects an imbalance between employee compensation and corporate profits (Hung, 2009). However, this evidence is likely to be the result of a greater number of potentially overlapping factors whose relative quantitative importance is difficult to disentangle.

[11] It should be noted that analyses of wage trends in China face "the lack of systematic, consistent aggregate data that cover wages and labour compensation over a wide basis and an extended period of time" (Yang, Chen and Monarch, 2009: 5). This is probably why headlines about double-digit growth rates of wages in China (e.g., JPMorgan, 2010; EIU, 2010: 27) frequently cause confusion: they refer to the 13 per cent growth between 1998 and 2007 or to the 12 per cent rate of growth in real wages between 2003 and 2009 calculated on the basis of data for *urban* wages and salaries. The problem with these data is not only that they exclude non-urban manufacturing activities (such as in township and village enterprise (TVEs)), where wages are much lower, but also that they mainly cover the urban workforce in State-owned enterprises, where wages tend to be higher than in the private sector (Yang, Chen and Monarch, 2009: 9). Perhaps the most detailed study on labour cost developments in China (Lett and Banister, 2009: 36), which takes into account both manufacturing urban units and manufacturing TVEs, found that, between 2002 and 2006, employee compensation (including wages, social welfare contributions, housing and other benefits) in urban manufacturing units grew by an average annual rate of 12 per cent and in TVEs by 7 per cent; with two-thirds of manufacturing employees categorized as TVE workers, "total manufacturing compensation in China more closely reflects the compensation costs of TVE workers than it does urban unit compensation costs." Another study provides supportive evidence: it also indicates an average annual rate of real wage growth in urban manufacturing of about 11.4 per cent between 2002 and 2006, which significantly exceeds the increase of about 4.7 per cent for rural migrants during the period 2003–2006 (Park, Cai and Du, 2010).

While statistical issues[12] were key elements behind the one-off drop in the share of labour compensation in GDP between 2003 and 2004, structural change has probably been a key determinant of the tendency of this share to decline since the mid-1990s. A recent study decomposes the change in the aggregate share of labour compensation in GDP into changes stemming from shifts in aggregate output structure and those caused by differences in sectoral employment shares (Bai and Qian, 2009b). On the basis of this analysis, the authors argue that the main cause of the falling share of household disposable income and labour compensation in GDP since the mid-1990s has been the declining importance in total value added of agriculture and the growing importance of industry and services, with the employment share being much larger in the former than in the latter sectors. They also show that the lower share of employment in the industrial sector itself has been an amplifying factor since the mid-1990s. But other factors have probably also contributed. During the late 1990s and early 2000s, a sizeable part of the decline in the wage share in industry was most likely due to the reform of State-owned enterprises. Moreover, for the entire 15-year period, the exceptionally high investment rate, the substantial inflows of foreign direct investment and the resulting capital-intensive structure of industrial production, combined with rapid technological progress and very high rates of labour productivity in Chinese manufacturing, must have contributed significantly to the relatively slow pace of employment growth in manufacturing, and hence in total labour compensation.[13]

A further factor that might have slowed down the growth rate of total employee compensation was the continued abundant supply of very-low-cost workers – a factor that is often assumed to be a defining characteristic of the Chinese economy. One way of estimating developments regarding surplus labour is by looking at the age structure of a country's labour force.[14] While the size of China's total labour force (i.e. the population aged 15 years and older), is likely to peak only in the mid-2030s, its pre-retirement labour force (the population aged between 15 and 64 years), can be expected to peak at around 2015 (figure 6A). Perhaps more importantly, the size of the population entering the labour force defined broadly (i.e. the 15–24 year age group) reached its peak of 224 million people in 2009, and that of the population entering the labour force defined narrowly (i.e. the 15–19 year age group) reached its peak of 125 million people in 2005 (figure 6B). Taken together this evidence is indicative of an ageing labour force in China, which tends to be less mobile. Consequently, employers will need

[12] According to international practice (such as followed in the United Nations System of National Accounts) the proceeds from self-employed work are treated as operating surplus (i.e. capital income), unless the self-employed receive wages from their own enterprises or unless individuals create their own enterprises. Given the difficulty in distinguishing between capital income and labour income in the proceeds from self-employed work, China's National Statistics used to categorize both as labour income (Aziz and Cui, 2007). One rationale for this might have been that in poor countries the self-employed tend almost entirely to provide labour services. This changed in 2003–2004: since 2004, the income of self-employed individuals engaged in non-agricultural activities has been counted as capital income (Bai and Qian, 2009a). As a result, more than half of the steep decline in the share of employee compensation (the thick line shown in figure 5) for 2004 was most probably due to this change in statistical reporting (Bai and Qian, 2009b).

[13] According to standard economic theory, a high and increasing rate of investment and a growing capital intensity of production reduce the return on capital. As a result, the total income accruing to capital would decline and that accruing to labour would increase. This is the opposite of what happened in China. A possible explanation is that rapid technological progress accompanied the intensive use of capital and prevented additional investment from becoming less efficient.

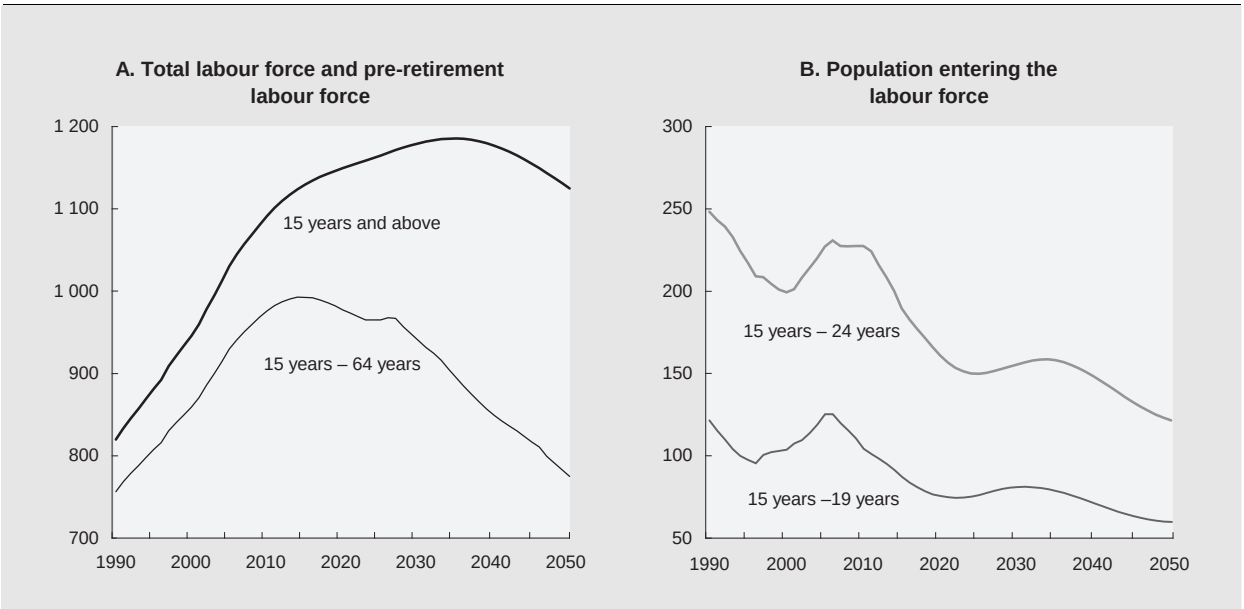
[14] One complementary measure relates to the unemployment trend. However, data available for China provide conflicting evidence of this trend: while data from the 2000 census and from the 2005 mini census point to a decline in unemployment, from 8.1 per cent to 5.2 per cent over this period of time, labour force survey data for the same period suggest that in 2002 there was a reversal of the initial decline in unemployment, but that, nonetheless, unemployment declined from 7.6 per cent in 2000 to 7 per cent in 2005 (Park, Cai and Du, 2010). Another complementary measure relates to surveys of wage rates. According to Zhang, Yang and Wang (2010), primary surveys of wage rates provide more reliable statistics than employment data and indicate an acceleration of the trend increase in real wages that had begun in 2003.

to pay a higher wage premium to get and retain workers,[15] so that real wages are likely to grow more rapidly relative to productivity than in the past. Indeed, according to media reports, minimum wages have been rising strongly in several provinces (Mitchell and Dyer, 2010). While this evidence suggests a broad tendency towards rising wages, it must be interpreted with caution. Part of it could be a reaction to more supportive agricultural policies, such as the abolition of the agricultural tax (Knight, 2007). But in any case, although not for demographic reasons, this would have increased the premium for employers to induce workers to migrate from rural to urban areas. All of these factors combined could be a powerful stimulus to domestic consumption.

Figure 6

CHINA'S LABOUR FORCE BY AGE STRUCTURE, 1990–2050

(Million)



Source: Author's calculations, based on the United States Census Bureau database.
Note: Data from 2010 are estimates.

Taken together, this evidence indicates that Chinese households' disposable income, and hence their consumption spending, is likely to increase in the near future due to demographic developments that will exert upward pressure on wages. This tendency could be reinforced through policy measures. Financial sector reform and government transfer payments could increase the non-wage elements of household incomes, while an increase in government spending on social security (including pensions, health and education) and public investment in housing could help reduce household precautionary savings.

[15] This evidence does not mean that China's total labour supply is shrinking and that the country will be facing a labour shortage any time soon. On the other hand, the radically altered age structure of the labour force means that wages are almost certain to rise faster relative to productivity growth than they have over the past 20 years.

III. THE TRADE IMPACT OF CONSUMPTION SPENDING IN THE UNITED STATES AND CHINA

Buoyant consumer demand in the United States was the main driver of global economic growth for many years in the run-up to the current global economic crisis. A return of United States household savings to about 4 per cent of disposable income – the average of the mid-1990s (i.e. before those households went on a spending spree) – would translate into a fall in household consumption of about 3 per cent of United States GDP. Given that before the crisis United States household consumption accounted for about 16 per cent of global demand and that a sizeable part of United States consumption consists of imports, this would imply both a reduction in world demand and a decline in other countries' export opportunities. From 2000 to 2007, United States imports grew from an amount equal to 15 per cent of United States GDP to 17 per cent, boosting aggregate demand in the rest of the world by $937 billion, in nominal terms. Moreover, given global production sharing, United States consumer spending boosts global economic activities also in many indirect ways, e.g. business investment in countries such as Germany and Japan to produce machinery for export to China and its use there for the manufacture of exports to the United States. In short, the future path of United States consumption spending has macroeconomic implications not only for economic recovery in the United States but also for global growth.[16]

The question arises as to which countries' consumer demand could make up for the decline in United States consumer demand. This raises at least three issues: (i) the importance of the absolute level of United States household consumption at the global level; (ii) the composition of United States imports of consumer goods; and (iii) the import content of United States household consumption. The first two of these issues are discussed in the remainder of this section, while the latter one is addressed in the following section.

Regarding the first question, United States consumer demand is by far the largest in the world in absolute terms (figure 7). It should be noted that figure 7 gives a somewhat biased impression because the underlying data relate to the period when highly leveraged, unsustainable debt-financed consumer spending played a sizeable role in the United States. This is in strong contrast to China where household debt to GDP is roughly 20 per cent (i.e. relatively low because, for example, the vast majority of cars is sold for cash), compared to about 100 per cent in the United States (Lardy, 2009: 6). This means that in the United States consumer demand is likely to shrink, not just grow slower, while in China it is likely to grow rapidly. Hence, the contribution of China to global consumption in the future is likely to be significantly larger than extrapolations of the data represented in the graph may indicate.

What would be the impact of a reduction in United States consumer demand on the country's current-account balance? The deterioration in the United States current account balance up to 2006 and its recent improvement have been largely driven by changes in the trade account.[17] Indeed, merchandise trade is by far the most important component of the United States current account. With a deficit of about $800 billion, which corresponds to 6 per cent of GDP, the trade deficit has been responsible for an average of about 110 per cent of the current-account deficit in the past five years.[18]

---

[16] The adverse demand effect on the rest of the world would also occur if household consumption was replaced by government consumption. This is because much of government consumption relates to public sector service activities which have a low import content.

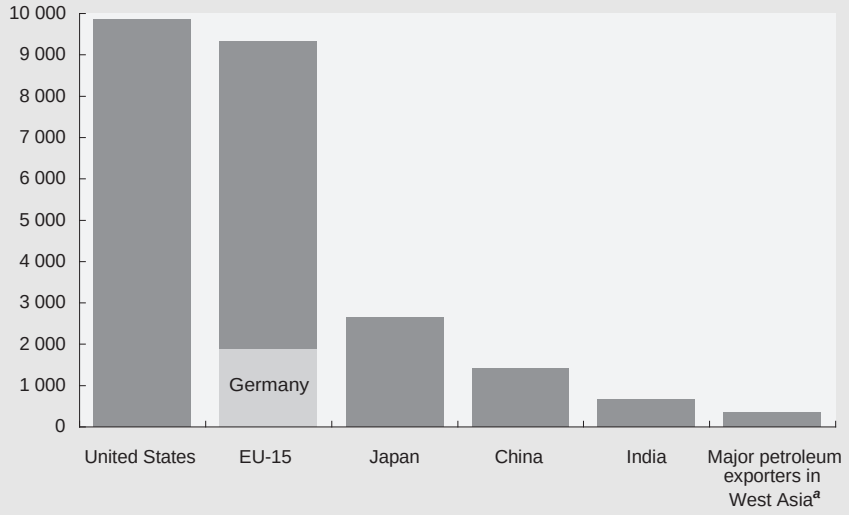
[17] The current account is the sum of the trade balance, the balance on labour income, the balance on international investment income and unilateral transfers (foreign aid and remittances).

[18] While the balance on unilateral current transfers is slightly negative, the balance on income and on trade in services is positive, so that the trade deficit exceeds the size of the current-account deficit as a whole (numbers in text calculated from the Bureau of Economic Analysis Aggregate Income and International Transactions databases).

Figure 7

HOUSEHOLD CONSUMPTION IN SELECTED COUNTRIES AND COUNTRY GROUPS, AVERAGE FOR 2007–2008

(Billions of dollars)



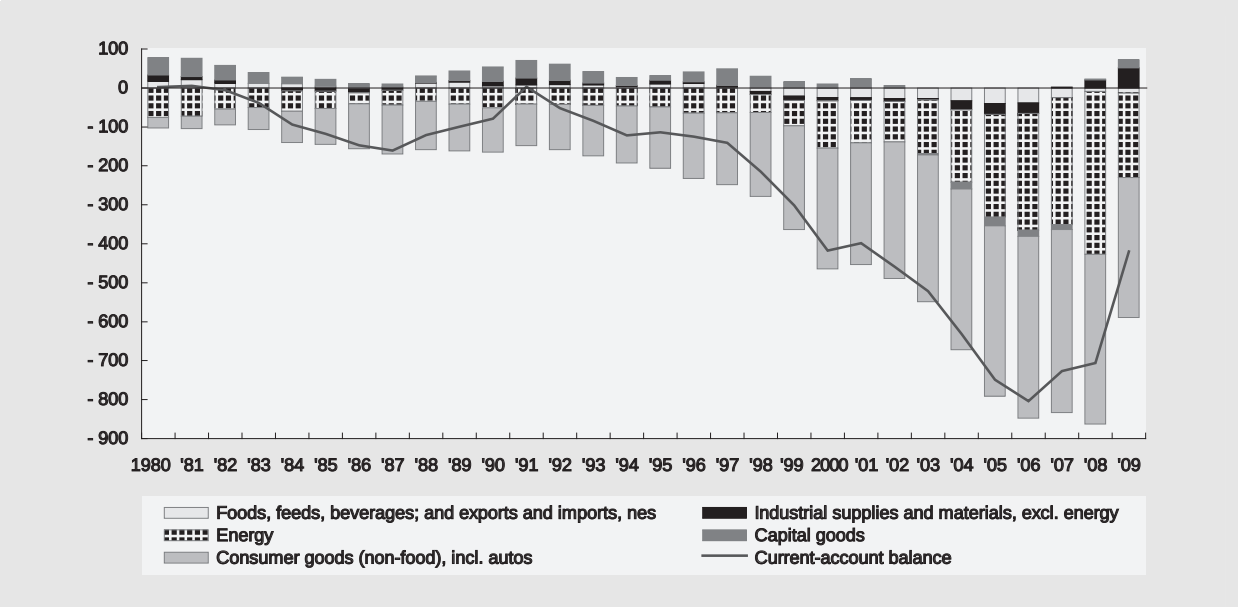
Source: Author's calculations, based on *UNCTAD Handbook of Statistics* database.
a Bahrain, Iraq, Kuwait, Oman, Qatar, Saudi Arabia, Syrian Arab Republic and United Arab Emirates.

However, these aggregate data mask important features that are of particular importance for the link between household consumption and current-account imbalances. While capital goods and industrial supplies and materials (excluding energy) are the largest categories on both sides of the United States trade account, a disaggregation of the United States trade deficit by main end-use categories shows that consumer goods, including automotive products, accounted for over 85 per cent of the increase in the non-energy trade deficit between 1997 and 2008 (figure 8). A loss in competitiveness may partly explain the worsening balance of trade in consumer goods. But the rapidly expanding household consumption has most likely been the major cause of the large and widening deficit in the consumption categories of United States trade, and thus in its current account.

Figure 8

CURRENT-ACCOUNT BALANCE AND TRADE BALANCE BY END-USE CATEGORY IN THE UNITED STATES, 1980–2009

(Billions of dollars)



Source: Author's calculations, based on the United States Bureau of Economic Analysis database.
Note: nes = not elsewhere specified.

It is unlikely that the sharp decline in United States imports of consumer goods could be compensated by an increase in consumer spending and associated imports of consumer goods by China or any other developing country. Given that China's consumption was only about one eighth of United States consumption and that its GDP at current exchange rates is only one third that of the United States, there is little reason to believe that household consumption in China could supplant United States household consumption as a driver of global growth any time soon.[19] In order for Chinese consumption to compensate for the decline of United States consumption back towards its average long-term trend, the share of consumer spending in GDP in China would need to increase by about 10–15 percentage points (depending on the difference in the two countries' rate of GDP-growth) – an unlikely occurrence in the foreseeable future.[20] Domestic demand could also expand in other relatively large and rapidly growing developing countries, notably Brazil and India. However, compared to the United States economy, the economies of these countries are still small, making it unlikely that they could compensate fully for the decline in United States consumption. Rather, household consumption in developed countries in the European Union, particularly Germany, as well as Japan, would be better placed to achieve this.

Perhaps even more importantly, the composition of United States imports of consumer goods differs greatly from that in many other countries. An import similarity index based on 428 different consumer goods indicates that China's basket of imported consumer goods overlaps that of the United States by

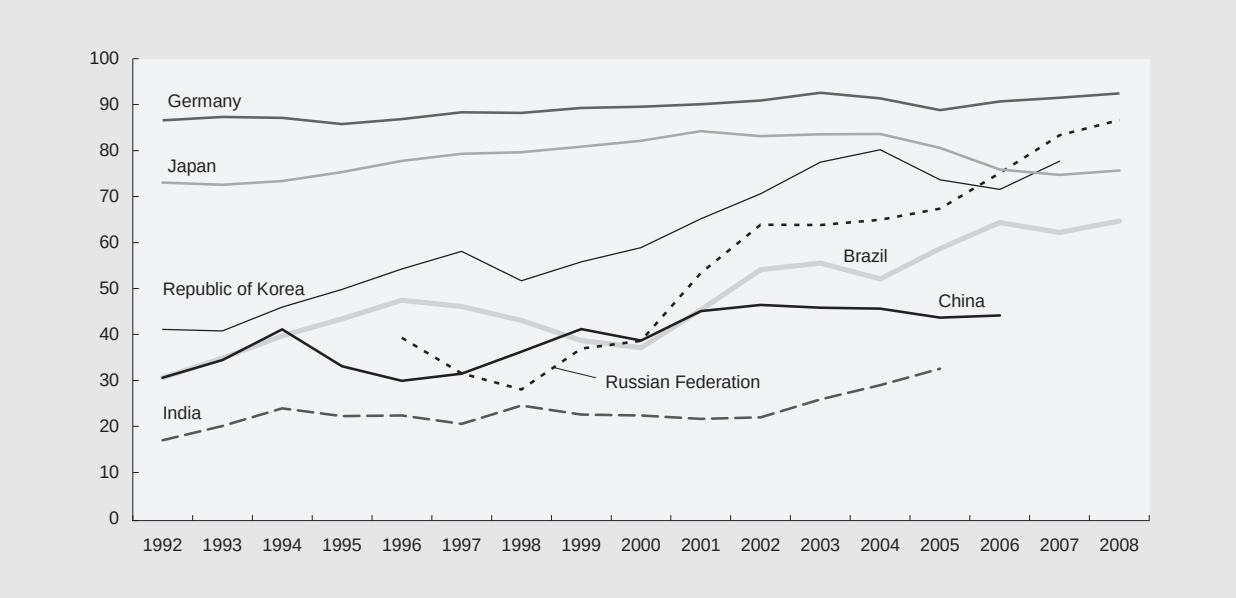
[19] What is more, the import content of domestic consumption in China is significantly smaller than in the United States (see section 4 below).

[20] According to the Bank for International Settlements (2007: 56) "final consumption goods constitute only 4 per cent of China's total imports and calculations suggest that the elasticity of demand for its ordinary imports (i.e. those not used for processing in the export sector) with respect to domestic spending is insignificant."

only about 45 per cent (figure 9).[21] This index also indicates that the composition of imports of consumer goods by major developed countries with current-account surpluses, namely Germany and Japan, is very similar to that of the United States. Combined with the evidence on the size of household consumption shown in figure 7, this shows that these two developed countries would be in a better position than China to compensate for the decline in United States consumer goods imports.

Figure 9

PERCENTAGE OF SIMILARITY IN THE COMPOSITION OF CONSUMER GOOD IMPORTS OF SELECTED COUNTRIES WITH THE IMPORTS OF THE UNITED STATES, 1992–2008



Source: Author's calculations, based on United Nations, *UN COMTRADE* database.

[21] For this analysis, consumer goods are identified on the basis of the United Nations Classification by Broad Economic Categories (BEC), codes 61, 62 and 63, which cover durable, semi-durable and non-durable consumer goods, respectively (United Nations, 1971). Using concordance tables, these codes were translated into 428 products at the 5-digit level of the Standard International Trade Classification, Revision 3. The import similarity index between two economies $j_{1,2}$ is: $100\sum_i s(i,j_1)s(i,j_2)/(\sqrt{\sum_i s(i,j_1)^2}\sqrt{\sum_i s(i,j_2)^2})$ where $s(i,j)$ is the share of good i in the imports of country j.

IV. THE ACCUMULATION OF GLOBAL IMBALANCES: INCOME, TRADE AND EMPLOYMENT EFFECTS IN DEVELOPING COUNTRIES

The previous sections addressed issues in relation to consumption spending in China and the United States. However, it is clear that developments in consumption spending in these two countries affect the global economy as a whole. One reason for this is the large size of these two economies. More important in the current context is the continued large difference in their levels of per capita income combined with the fact that the level and structure of world trade is influenced by the relative importance of rich and poor countries in global economic growth.[22] As long as per capita income growth in rich countries drive the rate of global economic growth, their demand pattern will have a key effect for global trade patterns: given their already high levels of industrialization and per capita income, their demand preferences will, in addition to often non-tradeable services, tend to emphasize manufactured consumer goods, rather than industrial raw materials, energy and food products that will feature more prominently in the demand patterns of rapidly industrializing poorer countries. But if rapidly industrializing developing countries assume an increasingly more important role in global demand growth, their demand pattern, and its relatively greater emphasis on industrial raw materials, energy and food products, will play a greater role in global demand growth.

Whether per capita income growth is driven by investment, consumption or exports will also affect global trade flows. There are sizeable differences in the import intensity of different components of demand. Numerical evidence from developed countries indicates that import intensities vary over time and that, in most countries, the import intensity of exports exceeds that in consumption which, in turn, exceeds that in investment (see, e.g., Kranendonk and Verbruggen, 2008). The large import intensity of exports is due to the internationalisation of production through global value chains. The import intensity of household consumption is relatively low because of the importance of non-tradeable services in consumer spending. The level of the import intensity of investment very much depends on the maturity of the domestic capital-goods industry, as well as on the importance of foreign-direct investment in gross capital formation. Though there is no readily available numerical evidence, the import intensity of private consumption most likely exceeds that of government consumption, since public servant wages are an important part of the latter. Similarly, the import intensity of private investment is likely to exceed that of public investment, since the latter includes a lot of services.

While these differences in the relative importance of import intensities across different elements of aggregate demand are likely to apply in most countries, there are important differences across countries for specific elements. Evidence for developed countries indicates that the import intensity of consumption in the United States is significantly lower than that in countries of the Euro-area, and that the import intensity of United States exports is also very low. For the period 2003–2007, the import intensity of United States consumption was only slightly more than half that of Germany, while the import intensity of United States exports was less than one third of that of Germany (see, e.g., Kranendonk and Verbruggen, 2008). Assuming a given level of total aggregate demand, this implies that demand rebalancing from exports to consumption in Germany combined with demand rebalancing from consumption to exports in the United States would cause a decline in the imports of these two countries combined.

Similar numerical evidence is not available for developing countries. However, estimates indicate that the import intensity of China's consumption is only about 8 per cent, i.e. about half that in the United States (Akyüz, 2010). The same study estimates that the import intensity of China's exports is significantly higher than that of developed countries, but that it is even higher in the other developing

[22] Differences in comparative advantage among developed countries, as well as among developing countries, play of course also a role for the composition of global demand. As far as developed countries are concerned, rapid economic growth in, for example, Japan will imply global imports of industrial raw materials, energy and food products to grow more rapidly than similar growth rates in countries with a richer natural-resource endowment, such as the United States.

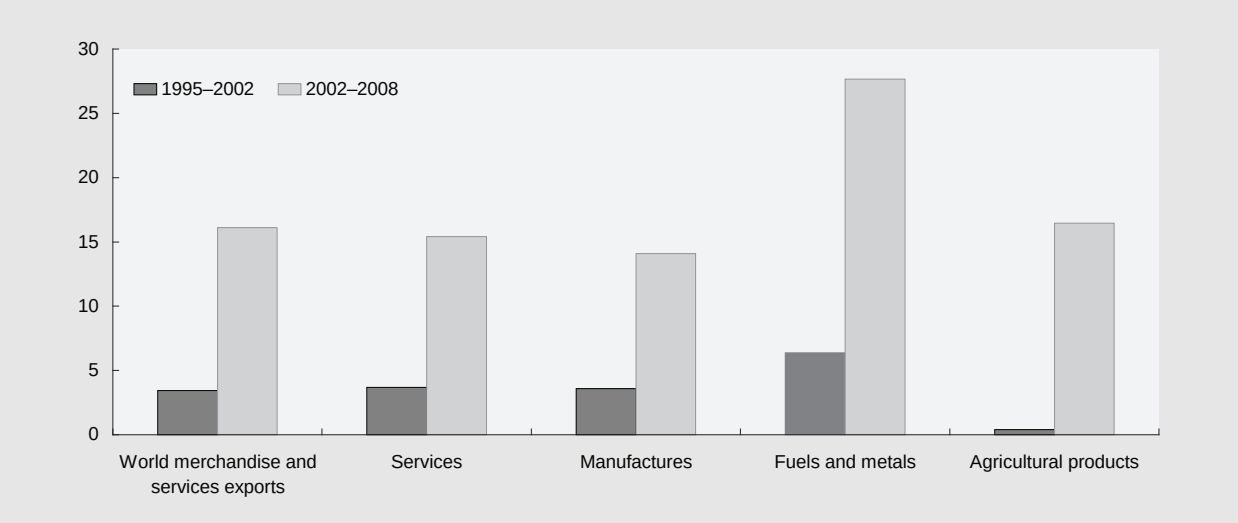
countries participating in the East and South-East Asian production networks, such as Malaysia and Thailand.

Differences in the import intensity of different elements of aggregate demand imply that changes in the composition of a country's aggregate demand will cause significant shifts in its imports. They also imply that these changes in imports occur even if the level of national aggregate demand itself does not change. On the other hand, these changes are reinforced by differences in the growth rates of the different components in global aggregate demand. For example, in the lead-up to the current crisis, global output growth was characterized by a relatively high import intensity, based on the combination of three factors: (i) rapid growth in the United States based on consumption, rather than exports; (ii) the export-oriented development strategy that many countries in East and South-East Asia have been following over the past two or three decades, which was embedded in global production sharing and an associated high import content of these countries' exports; and (iii) the ensuing rapid industrialization in Asian developing economies, especially China, which was one of the factors that supported rapidly growing demand and booming prices for primary commodities between 2002 and 2008. The resulting boost to the exports of commodity-exporting countries is reflected in the fact that, over the period 2002–2008, world exports of agricultural products and especially of mineral and fuels grew more rapidly than total world exports of goods and services (figure 10). These developments strongly mitigated, and temporarily reversed, the usually bleak demand prospects for primary commodity production.

Figure 10

GROWTH RATES OF WORLD TRADE BY SECTOR, 1995–2002 AND 2002–2008

(Per cent)



Source: Author's calculations, based on *UNCTAD Handbook of Statistics* database.

These level and compositional effects of global demand have price implications. For example, a tendency towards a greater importance of manufactured consumer goods in global demand, driven by rapid growth in industrialized economies, may result in a downward shift in the terms of trade for primary-commodity exporters, while a tendency towards a greater importance of industrial raw materials, energy and food products, driven by rapid growth in relatively less-industrialized countries, may reverse this downward shift, at least temporarily. These price effects will, in turn, guide investment decisions and lead to changes in the sectoral focus of investment, productivity, output and employment growth.

The remainder of this section examines which sectors have driven per capita output growth and employment generation in developing and transition economies during the period prior to the current crisis. Four economic sectors are identified: agriculture (which also includes hunting, forestry and fishing), mining (which also includes utilities), manufacturing and services.[23] Two sub-periods are distinguished: (i) from 1995 to 2002, when developed countries, notably the United States, were the dominant drivers of global demand, while several emerging-market economies experienced slow growth; and (ii) between 2002 and 2008, when economic growth accelerated in a number of emerging-market economies, in particular the large and populated "BRIC" countries (i.e. Brazil, the Russian Federation, India and China) that joined the United States as major drivers of global demand, which boosted the demand for primary commodities. The distinction of these two sub-periods forms the background for projections, in the following section, with regard to an emerging situation in which the importance for global growth of United States consumer demand will tend to decline sharply, while the role of the BRIC countries for global growth and global demand patterns is likely to remain growing.

In the vast majority of developing and transition economies that have experienced rapid per capita output growth, this has been associated with above-average growth of output in manufactures and/or services (figure 11), particularly in China and India. In countries where aggregate growth rates have been negative or low, so have been the growth rates of manufactured output. During the first sub-period, in most regions per capita output growth was slow, without a clear sectoral pattern.

When overall output growth accelerated after 2002, growth rates in the manufacturing and services sectors exceeded those in agricultural and mining sectors – a somewhat surprising development in a context of rapidly rising primary commodity prices in global markets. Several factors could explain this feature. First, it could indicate that policymakers managed well the inflow of windfall profits resulting from the commodity price boom. Using these revenues for diversifying their economies such that supplementary income obtained from primary activities could generate demand for the entire domestic economy, policymakers may have avoided the adverse impact on non-resource sectors that previously had often been associated with natural-resource booms.

A, second, complementary explanation may be that rapidly expanding household consumption in the United States provided sufficiently high external demand for many developing countries such that, on aggregate, developing and transition economies enjoyed buoyant external demand across all four economic sectors.[24] This could further explain, for example, the increase in the growth rates of manufactured output between the first and the second sub-period in those countries that export manufactures to the United States either directly (such as South America, Central America and the Caribbean, as well as South Asia excluding India), or more indirectly as part of the vertically integrated production chain that spans across South-East and East Asia and whose hub in most instances is China (figure 11). To the extent that this is the case, a decline in United States household consumption, and the potentially associated decline in United States imports of manufactured goods, is likely to have serious adverse implications for the manufacturing sectors in a wide range of developing countries. This issue is addressed in more detail in the following section.

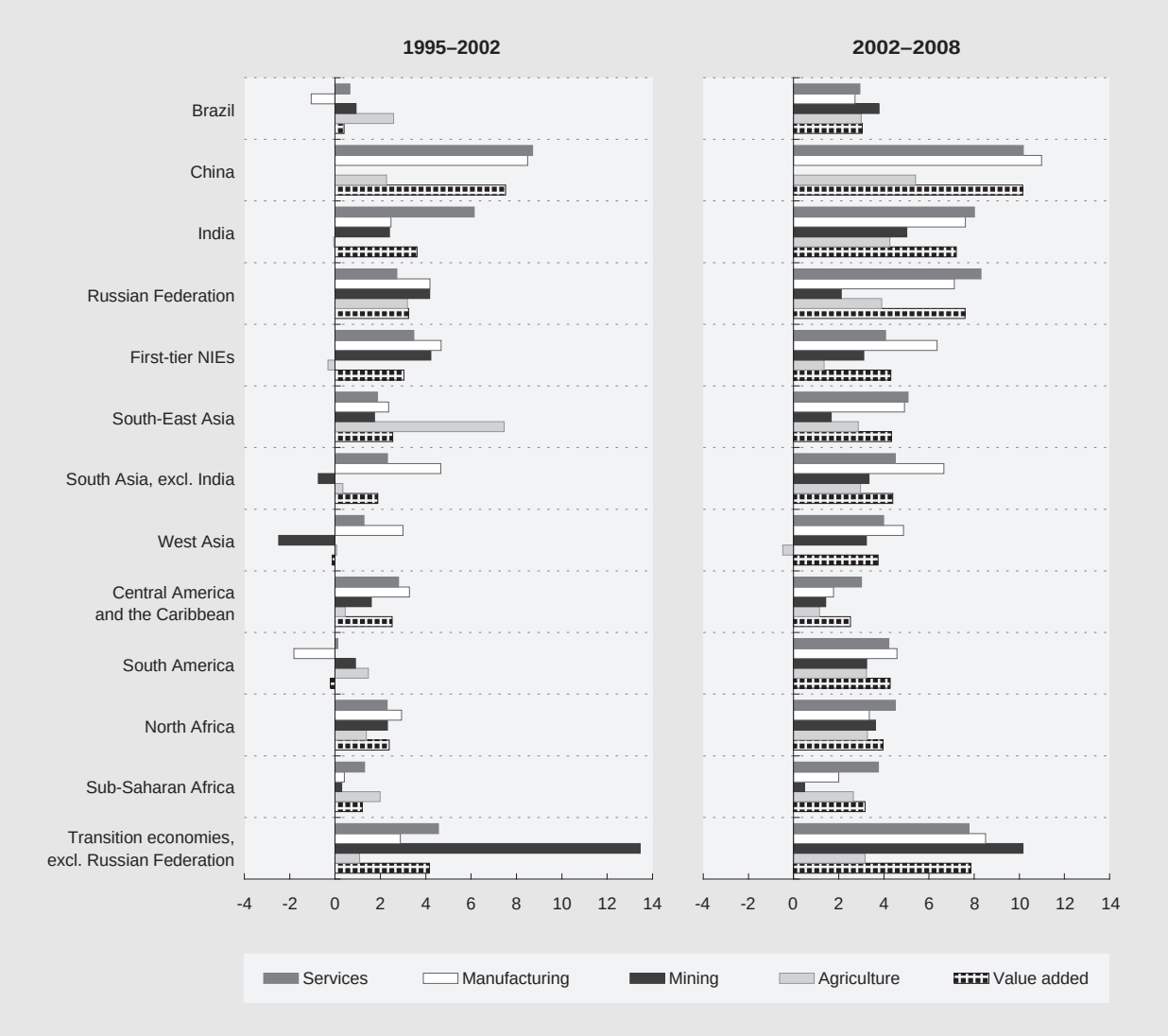
[23] Construction is not included in this analysis because developments in the real estate sector are often affected by financial factors unrelated to productivity and employment, which would blur the analysis.

[24] Rapid growth of the services sector was probably also due to strong expansion of retailing and other consumption related services and, thus, more a reaction than a cause of the rapid expansion of aggregate output.

Figure 11

PER CAPITA OUTPUT BY SECTOR, SELECTED COUNTRIES AND COUNTRY GROUPS, 1995–2008

(Average annual growth rates)



Source: Author's calculations, based on *UNCTAD Handbook of Statistics* database; and UNECE, *Economic Statistics* database for the Russian Federation in 2002.

Note: South-East Asia excludes Singapore. West Asia comprises: Jordan, Kuwait, Qatar, Saudi Arabia and the United Arab Emirates. North Africa excludes Sudan. First-tier newly industrializing economies (NIEs) are: Hong Kong (China), the Republic of Korea, Singapore and Taiwan Province of China. For China, mining is included in manufacturing due to the lack of disaggregated output data for mining.

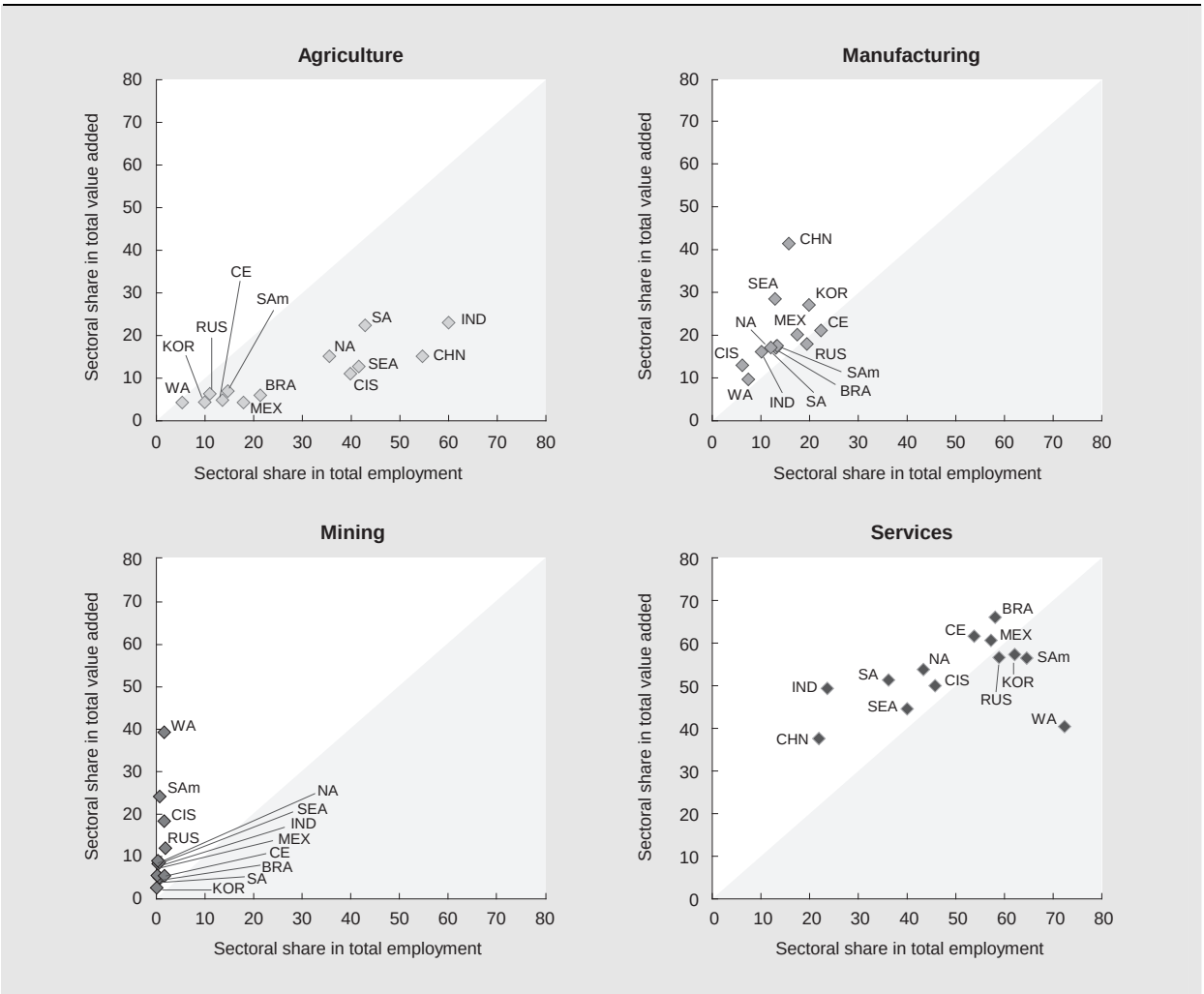
While figure 11 indicate percentages changes over the past 15 years, the absolute number of jobs that these four sectors have provided depends on their relative weight in each economy. Agriculture accounts for a significant share of total employment in several regions, particularly in Asia, North Africa and the CIS countries, a share that is much larger than its relative contribution to total value added (figure 12).[25] This contrasts with manufacturing, where the contribution to total GDP is generally higher than that to total employment, showing that labour productivity in manufacturing is above the average for these economies. With regard to the mining sector, it appears that whatever it may contribute to GDP, its direct contribution to employment is marginal. The services sector

[25] Due to data limitations, sub-Saharan Africa is not included in figure 12.

accounts for the largest share of employment in many regions, with labour productivity close to the economies' average labour productivity. Taken together, this evidence indicates that the employment impact of global rebalancing will most likely be closely related to the sectoral effects that rebalancing will entail. The next session focuses on this issue.

Figure 12

AVERAGE SECTORAL SHARES IN TOTAL VALUE ADDED AND EMPLOYMENT, SELECTED COUNTRIES AND COUNTRY GROUPS, 1995–2008



Source: See figure 11.

Note: For mining in China see note to figure 11.
BRA: Brazil; CHN: China; IND: India; MEX: Mexico; KOR: Republic of Korea; RUS: Russian Federation; SEA (South-East Asia): Indonesia, Malaysia, the Philippines and Thailand; SA (South Asia): Pakistan and Sri Lanka; WA (West Asia): Qatar and Saudi Arabia; SAm (South America): Argentina, the Bolivarian Republic of Venezuela, Chile, Colombia, Ecuador and Peru; NA (North Africa): Egypt and Morocco; CE (Central Europe): Czech Republic, Hungary and Poland; CIS (Commonwealth of Independent States): Azerbaijan, Georgia, Kazakhstan and Kyrgyzstan. Time periods vary: 1995–2007: China, Republic of Korea, South Asia and North Africa; 1995–2006: India; 1998–2007: CIS.

V. THE POTENTIAL IMPACT OF A GLOBAL REBALANCING ON TRADE FLOWS AND EMPLOYMENT IN DEVELOPING COUNTRIES

This section focuses on the implications of global rebalancing for trade flows and employment. These implications are inferred from a simulation of the impact of reduced consumer spending in the United States and increased consumer spending in China (both measured as a share in GDP) on changes in sectoral trade flows and employment. Annex 1 to this paper provides details on how this simulation was carried out, and presents some additional results. The results from the simulation may be considered as reflecting the medium-term effects (i.e. spanning a period of 5–10 years) of rebalancing confined to China and the United States. However, it should be borne in mind that the results of the simulation are only partial; they are not intended to describe the overall impact of a global rebalancing. In addition, they should be interpreted with considerable caution since they do not take into account a number of factors, such as difficulties in moving labour across sectors, subsidies and problems of market access. Nevertheless, simulations are useful for identifying the countries and sectors that are vulnerable to global rebalancing and for forming an idea of the order of magnitudes involved.

The simulation is based on the assumptions that adjustment in the United States would lead to a slowdown in the rate of GDP growth there,[26] and that in both China and the United States the share of household consumption in GDP would be restored to historic levels. Taking account of differences in the size of GDP in China and the United States, the latter assumption implies that the increase in China's consumption would compensate about half of the decline in United States consumption. To anticipate the main result: the simulation indicates that this would remove much of the demand stimulus, which, prior to the outbreak of the current crisis, the United States was providing to the world economy, and that this would not be compensated by a stimulus of similar size from increased consumption in China.

The results of the simulation are presented in terms of changes relative to 2008. With respect to global imbalances as a whole, the results indicate that the assumed adjustments in China and the United States would cause substantial changes in these two countries' trade accounts: for China, the trade surplus as a share of GDP would decline by more than eight percentage points, so that only a fairly small surplus position would remain, while for the United States, the trade balance as a share of GDP would improve by more than five percentage points and move the trade account into a slight surplus (columns 2 and 3 in table 1). However, important trade imbalances would persist in other countries: for example, trade surpluses would decline only a little in Germany and in the countries in the group comprising West Asia and North Africa. In spite of sizeable reductions, the trade surplus would also remain high in a number of developing countries in East and South-East Asia, such as Malaysia, the Philippines, Thailand, and the countries comprising the group of other countries in East and South-East Asia. These results are likely to be due to the fact, discussed in the two preceding sections, that the absolute value of China's household consumer spending is much smaller than that of United States households, its import content is smaller, and the composition of China's imports of consumer goods differs greatly from that of the United States. The net effect of the two adjustments taken together would be deflationary for the world economy, while they would not be sufficient to unwind the global imbalances.

[26] This assumption is consistent with the simulations by the United Nations (2010) which indicate that the ratio of the United States current-account deficit to GDP would increase, rather than shrink, over the coming five years if the United States economy were to grow at a rate similar to that prior to the current crisis. It is also in line with earlier experiences of rebalancing in countries with an external deficit that is typically associated with a slowdown in output growth, as noted by the IMF (2010). A main finding of this latter study is that policy-induced reversals of external surpluses are not typically associated with lower growth, which is in line with the assumptions made here with regard to China. However, to the extent that exporting allows for dynamic external benefits (e.g., through learning-by-doing effects) that are not present in output production for the domestic market, rebalancing from exports to domestic consumer demand may imply a slowdown in output growth.

Table 1

GTAP SIMULATION RESULTS OF THE IMPACT OF REBALANCING IN CHINA AND THE UNITED STATES ON TRADE FLOWS AND FACTOR PRICES, SELECTED COUNTRIES AND COUNTRY GROUPS

	Change in trade balance	*Share of trade balance in GDP*	*Change in export volume*	*Change in import volume*	*Change in terms of trade*[a]	*Appre-ciation*[b]	*Change in wages*[c]	
							Unskilled labour	*Skilled labour*
	(Percent-age points)	*(Per cent)*						
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
China	-8.2	1.8	-17.6	3.7	2.9	7.1	6.6	8.8
United States	5.2	0.6	41.9	-15.4	-7.2	-8.2	-8.1	-8.5
China, Hong Kong SAR	-1.4	14.9	-1.2	0.6	-0.1	2.3	2.3	2.2
China, Taiwan Province of	-1.0	14.3	-0.6	1.4	0.3	2.1	2.1	2.0
Indonesia	-1.1	0.8	-2.8	1.0	0.3	2.7	2.7	2.7
Malaysia	-1.6	42.4	-0.5	1.3	0.3	2.3	2.1	1.9
Philippines	-1.3	3.6	-1.4	0.8	-0.1	2.1	2.1	2.0
Republic of Korea	-1.6	1.5	-3.4	1.5	0.8	2.9	3.1	2.9
Singapore	-1.7	-2.6	-0.3	1.3	0.5	2.7	2.7	2.7
Thailand	-3.7	5.8	-3.7	1.9	0.4	2.9	2.9	2.9
Rest of East and South East Asia	-1.6	2.0	-2.2	0.1	-0.1	2.1	2.0	1.7
India	-1.2	-7.7	-6.6	2.7	1.1	3.6	3.8	3.8
South Asia, excl. India	-1.2	-17.1	-6.7	1.7	0.8	3.3	3.2	3.3
West Asia and North Africa	-1.5	13.8	-1.7	2.6	0.7	2.8	2.9	2.6
Sub-Saharan Africa	-1.7	1.2	-2.5	3.1	0.7	3.1	3.2	3.3
Argentina and Brazil	-1.8	0.8	-7.7	5.2	2.1	4.1	4.0	4.1
Mexico	-2.1	-2.1	-6.0	4.9	3.3	3.2	3.3	3.4
Rest of developing America	-1.6	-1.8	-3.8	3.4	1.5	2.7	2.8	2.9
Canada	-1.7	-2.7	-2.9	5.7	3.1	2.3	2.4	2.4
Germany	-1.9	3.8	-3.8	2.3	0.6	3.2	3.1	3.1
Rest of EU-25 and EFTA[d]	-1.6	-3.5	-3.6	2.0	0.7	3.2	3.2	3.2
Australia and New Zealand	-1.5	-1.8	-5.5	3.8	1.5	3.6	3.7	3.6
Japan	-2.0	-1.0	-12.7	5.7	2.3	4.3	4.3	4.4
CIS, excl. the Republic of Moldova	-0.8	6.6	-1.2	1.4	0.4	2.9	3.0	2.8
Rest of the world	-1.8	-9.6	-2.3	1.7	0.3	2.9	2.9	2.6

Source: Author's calculations.

Note: All changes are relative to 2008.

a An improvement in the terms of trade indicates that the price of exports increased more (or fell less) than the price for imports.

b An appreciation indicates an increase in the price for primary factors, which may be likened to an appreciation of the real exchange rate.

c The definition of skilled and unskilled labour and the wage ratio between skilled and unskilled labour is explained in footnote 36.

d EFTA - European Free Trade Association.

Looking at developments in exports and imports separately (columns 4 and 5 in table 1), the results indicate that for the United States a sharp decline in imports would be accompanied by an even sharper increase in exports. Apart from China, whose trade balance would deteriorate mainly because of its own adjustment efforts, the greatest decline would occur for Thailand, followed by Mexico, Japan (which would experience the strongest percentage decline in exports), Germany and Singapore. In most countries, particularly developing countries in Asia (notably China, India and Thailand), the deterioration in the trade balance would be caused mainly by a decline in exports rather than by an increase in imports, as indicated by the difference in the growth rates reported in columns four and five of the table. The strong increase in United States exports (a large proportion of which consist of machinery and electronic equipment, as well as services) and the strong decline in its imports would be facilitated by the sharp depreciation of the dollar (column 7 in table 1).[27] Additional results (not shown here) indicate that the bulk of the increase in United States exports would be directed to developed countries, namely Japan and members of the European Union, while the bulk of the decline in United States imports would particularly affect the members of the European Union, as well as China and Japan.

Turning to changes in the sectoral structure of trade, the percentage changes in the trade balance of the United States would be largest for machinery and equipment and electronic equipment (table 2). This improvement would be mirrored by a sizeable deterioration in the trade balance for these sectors in all Asian economies included in the table, as well as Mexico and Germany. The strong improvement in the United States trade balance for chemicals (which includes pharmaceuticals – the single most important item in United States consumer goods imports) would be mirrored by a substantial deterioration in the trade balance for these products in Germany and Singapore. The strong improvement in the United States trade balance for motor vehicles and other transport equipment would be mirrored by a sizeable deterioration in the trade balance for these products in Argentina, Brazil, Mexico, Germany, Japan, the Republic of Korea, and Singapore (though most of these effects for Singapore are likely to be due to trans-shipment, as witnessed by the strong deterioration in Singapore's trade balance for commercial services and trade and transport).

To determine how the changes in sectoral trade balances would affect employment, it is useful to relate these changes to sectoral differences in labour intensity.[28] Concentrating on the changes in world exports of industrial products (shown in the last column of table 2) suggests that the simulated adjustments in the economies of China and the United States would lead to sizeable adverse employment impacts in the world economy as a whole. This is indicated by the fact that world exports

[27] The set-up of the GTAP-model implies that external imbalances caused by an exogenous shock are removed and the external balance is restored by changes in the prices of primary factors, downwards to spur exports and reduce imports, or upwards to reduce exports and increase imports. The relationship between the price of primary factors across different countries may be likened to an exchange rate. Real and nominal exchange-rate changes coincide because GTAP, as most other computable general equilibrium models, deals with real variables, with no money involved.

[28] This analysis is based on the methodology proposed by Rajan and Subramanian (2006), who measure the labour intensity of a sector by the unweighted average across countries of the share of wages and salaries in value added for specific industrial sectors. The averages used here refer to the period 1995–2005 and cover all countries for which data are available in the Industrial Statistics database CD-ROM, 2009 of the United Nations Industrial Development Organization (UNIDO). The mapping of industrial sectors at the three-digit level of the International Standard Industrial Classification (ISIC) Revision 3 into the sectors used for the GTAP-simulations is based on the concordance table made available on the GTAP-website (https://www.gtap.agecon.purdue.edu/databases/contribute/concordinfo.asp). The data-points shown in figure 13 are unweighted averages based on a total of 10,210 country-sector observations, of which 5,227 refer to developed, 4,573 to developing and 410 to transition economies, respectively. The distribution of the data-points along the horizontal axis in figure 13 changes only marginally if the period is limited to 2000–2005 or if averages are calculated only for developed or developing countries. The sample period ends in 2005 because no comprehensive data are available for more recent years.

would decline in the majority of industrial sectors (figure 13). Perhaps more importantly, the largest declines would occur in the most labour-intensive industrial sectors.[29]

Table 2

GTAP SIMULATION RESULTS FOR CHANGES IN SECTORAL TRADE BALANCE, SELECTED COUNTRIES AND COUNTRY GROUPS

(Per cent of GDP in base year 2008)

	China	*United States*	*Argentina and Brazil*	*CIS*[a]	*Germany*	*Japan*	*Malaysia*	*Mexico*	*Republic of Korea*	*Singapore*	*Thailand*	*Sub-Saharan Africa*	***Memo item:*** *Change in world exports relative to base year*
Grains and crops	-0.22	0.07	-0.06	-0.01	-0.01	-0.01	0.00	-0.10	-0.02	0.00	0.06	-0.09	1.46
Forestry and fishing	-0.02	0.00	0.00	0.01	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	1.03
Mining	-0.08	0.05	-0.01	-0.01	-0.01	-0.02	0.02	0.04	0.00	-0.09	-0.14	-0.08	-0.18
Livestock and meat products	-0.13	0.05	-0.07	-0.02	0.00	0.00	0.01	-0.08	-0.01	0.00	-0.01	-0.01	0.34
Processed food	-0.24	0.14	-0.11	-0.01	-0.02	-0.02	0.16	-0.19	-0.01	0.00	-0.16	-0.05	-0.93
Textiles	-0.51	0.10	-0.03	0.00	-0.01	-0.01	0.05	-0.14	-0.02	0.05	-0.01	-0.02	-1.85
Wearing apparel	-0.40	0.11	-0.01	0.00	0.00	0.00	-0.07	-0.11	-0.02	-0.02	-0.17	-0.06	-4.95
Leather products	-0.42	0.05	-0.03	0.01	0.00	0.00	-0.01	0.02	0.01	0.01	0.01	0.00	-4.30
Wood products	-0.31	0.11	-0.08	0.00	-0.02	-0.02	0.02	-0.13	-0.01	-0.01	-0.09	-0.01	-3.41
Paper products and publishing	-0.11	0.11	-0.06	-0.01	-0.03	-0.02	-0.01	-0.08	-0.04	-0.04	-0.03	-0.02	0.09
Petroleum and coal products	-0.02	0.01	-0.01	-0.01	0.00	0.01	0.00	0.00	0.01	0.07	0.00	-0.01	-0.29
Chemicals, rubber, plastic prod.	-0.62	0.68	-0.21	-0.13	-0.34	-0.23	-0.33	-0.28	-0.22	-0.42	-0.37	-0.14	-0.72
Mineral products, nes	-0.09	0.05	-0.04	0.00	-0.01	-0.01	0.03	-0.04	-0.01	-0.01	-0.03	-0.01	0.35
Ferrous metals	-0.11	0.04	-0.06	0.02	0.00	-0.02	0.03	-0.02	0.01	0.01	-0.07	-0.04	0.46
Metals, nes	-0.08	0.07	-0.05	-0.09	-0.02	-0.01	0.02	-0.06	0.00	-0.01	0.02	-0.12	0.27
Metal products	-0.33	0.12	-0.04	0.00	-0.03	-0.03	0.00	-0.11	-0.02	-0.02	-0.08	-0.03	-0.52
Motor vehicles and parts	-0.20	0.40	-0.15	-0.02	-0.18	-0.32	0.00	-0.41	-0.26	-0.04	-0.11	-0.11	-1.23
Transport equipment, nes	-0.25	0.37	-0.20	-0.10	-0.17	-0.10	-0.24	-0.03	-0.20	-0.67	-0.15	-0.15	4.18
Electronic equipment	-1.38	0.68	-0.13	-0.02	-0.18	-0.49	-0.77	-0.36	-0.33	-0.23	-0.72	-0.10	0.04
Machinery and equipment, nes	-2.05	1.40	-0.45	-0.17	-0.66	-0.64	-0.54	-0.71	-0.38	-0.45	-1.10	-0.37	1.85
Manufactures, nes	-0.58	0.20	-0.02	-0.01	-0.02	-0.03	0.01	-0.02	-0.02	0.01	-0.22	-0.04	-3.87
Utilities and construction	-0.02	0.03	-0.02	-0.03	-0.01	-0.02	-0.01	0.00	0.00	-0.01	-0.01	-0.02	4.27
Trade and transport	-0.47	0.34	-0.07	-0.11	-0.08	-0.09	-0.10	-0.11	-0.09	-0.15	-0.32	-0.15	-0.21
Commercial services	-0.15	0.51	-0.12	-0.10	-0.13	-0.11	-0.11	-0.10	-0.22	-0.47	-0.19	-0.17	1.10
Other services	-0.17	0.29	-0.08	-0.10	-0.10	-0.07	-0.16	-0.13	-0.13	-0.14	-0.14	-0.16	3.85

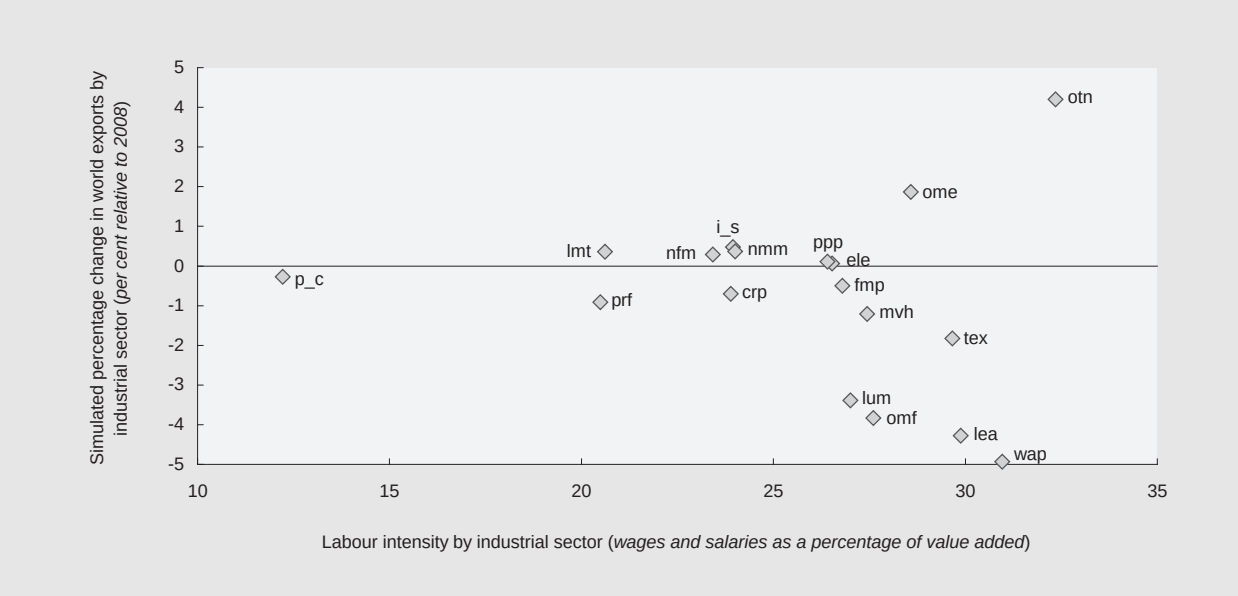
Source: Author's calculations.
Note: Trade balance refers to volumes. Percentage shares of trade volumes and values in GDP in the base year are identical, as prices are assumed to equal one.
nes = not elsewhere specified.
a Excluding the Republic of Moldova.

[29] There are two exceptions to this: (i) the category "machinery and equipment not elsewhere classified" includes, for example, machinery, domestic appliances, optical instruments, watches and clocks; (ii) the category "transport equipment not elsewhere classified" includes railway vehicles, aircraft and associated equipment, and ships and boats.

Figure 13

LABOUR INTENSITY AND GTAP SIMULATION RESULTS FOR CHANGES IN WORLD EXPORTS BY INDUSTRIAL SECTOR CAUSED BY REBALANCING IN THE UNITED STATES AND CHINA

(Per cent)



Source: Author's calculations, based on GTAP simulations; and UNIDO, *Industrial Statistics* database, CD-ROM 2009.
Note: Labour intensity is measured as the unweighted world average of the share of wages and salaries in sectoral value added during the period 1995–2005.

crp	=	Chemicals, rubber and plastic products	nmm	=	Non-metallic mineral products
ele	=	Electronic equipment	ome	=	Machinery and equipment not elsewhere classified
fmp	=	Metal products	omf	=	Manufactures not elsewhere classified
i_s	=	Ferrous metals	otn	=	Transport equipment not elsewhere classified
lea	=	Leather products	p_c	=	Petroleum and coal products
lmt	=	Livestock and meat products	ppp	=	Paper products, publishing
lum	=	Wood products	prf	=	Processed food
mvh	=	Motor vehicles and parts	tex	=	Textiles
nfm	=	Metals not elsewhere classified	wap	=	Wearing apparel

The decline in world exports of labour-intensive industrial goods will have different implications for different countries, depending on their sectoral production and trade structure. The simulation results for changes in sectoral employment suggest that in China employment would decline in most industrial sectors (but substantially increase in agriculture, utilities and services) (table 3). By contrast, in the United States, employment would increase in most industrial sectors, as well as in agriculture, but decline in all sectors in utilities and services. The United States is also the only country shown in the table (except Singapore) which would experience an increase in employment in the two labour-intensive sectors for which the estimations indicate an increase in world exports (see figure 13): "machinery and equipment not elsewhere classified" and "transport equipment not elsewhere classified". This contrasts with the results for most countries, especially those in Asia, for which the simulations indicate that adverse employment effects are likely to be concentrated in the most labour-intensive sectors. For example, among the countries shown in table 3, Japan, Malaysia, the Republic of Korea, and Thailand may experience a reduction (or only a very slight increase) in employment in labour-intensive sectors such as apparel, transport equipment, textiles, and machinery and equipment (which includes domestic appliances). However, these results should not be taken as quantitatively precise predictions. In particular, it should be noted that the evidence shown in figure 13 is limited to industrial sectors. Many of the countries that experience declining employment in (labour-intensive) industrial sectors record increasing employment in primary and services sectors, as shown in the two bottom panels of table 3. While data limitations do not allow making an assessment of the labour intensity of these sectors, the evidence shown in figure 12 above indicates that, in most countries,

agricultural and services activities are considerably more labour intensive than manufacturing. Thus, it is difficult to assess the impact of global rebalancing on total employment. In spite of these limitations the reported results taken together provide useful qualitative information that indicates broad directions of the possible employment effects of a global rebalancing resulting from adjustments only in China and the United States.

Table 3

GTAP SIMULATION RESULTS FOR CHANGES IN SECTORAL EMPLOYMENT, SELECTED COUNTRIES AND COUNTRY GROUPS

(Per cent)

	China	*United States*	*Argentina and Brazil*	*CIS*[a]	*Germany*	*Japan*	*Malaysia*	*Mexico*	*Republic of Korea*	*Singapore*	*Thailand*	*Sub-Saharan Africa*
Industrial goods												
Petroleum and coal products	1.1	-2.7	-0.4	-0.1	-0.3	0.2	0.1	0.6	-0.8	0.7	0.5	0.5
Processed food	4.8	-3.7	-0.9	0.0	0.2	-0.1	1.8	3.5	-0.2	0.6	-0.9	-0.2
Livestock and meat products	7.2	-1.3	-2.1	-0.3	0.3	-1.6	0.9	0.9	-1.2	0.2	-0.4	0.3
Metals, nes	-11.7	30.4	-6.7	-2.4	-2.7	-4.1	1.1	-1.8	-1.7	1.0	-3.0	-4.4
Chemicals, rubber, plastic products	-7.4	14.7	-4.3	-2.8	-3.3	-4.9	-2.0	1.7	-3.0	-1.9	-3.7	-1.6
Ferrous metals	-5.7	21.2	-4.1	0.3	-0.7	-2.8	2.6	3.6	0.1	4.7	1.0	0.3
Non-metallic mineral products, nes	-0.6	7.8	1.2	1.0	1.8	1.6	3.0	3.0	2.3	3.8	4.1	2.2
Paper products and publishing	-3.1	3.3	-2.8	-0.6	-0.8	-0.9	-0.7	1.8	-1.9	-1.2	-1.8	-0.4
Electronic equipment	-11.4	27.2	-1.8	0.1	-0.8	-4.7	0.1	-4.1	-1.6	0.5	-2.1	1.1
Metal products	-7.4	12.2	-2.5	0.2	0.4	0.6	1.5	-2.4	0.2	1.3	0.0	1.8
Wood products	-11.7	4.9	-4.5	0.4	1.2	2.0	0.6	-6.6	0.7	1.6	-3.5	0.5
Motor vehicles and parts	-2.3	4.1	-0.6	0.9	-0.3	-5.4	1.1	0.4	-2.1	4.0	4.0	1.5
Manufactures, nes	-9.5	17.3	0.8	-0.5	0.6	0.3	0.0	-1.0	-0.7	3.0	-3.2	-0.5
Machinery and equipment, nes	-10.3	21.3	-5.2	-0.2	-2.3	-5.7	-2.2	-3.0	-1.7	1.3	-4.0	-0.8
Textiles	-8.6	13.7	-2.2	0.2	0.3	-1.7	1.5	-4.1	-1.2	3.5	-1.3	-0.2
Leather products	-12.9	29.6	-3.8	2.9	1.4	-0.4	-3.1	5.4	1.4	2.6	1.0	2.2
Wearing apparel	-4.4	4.2	0.1	0.5	1.0	0.7	-6.3	-3.5	-1.4	-4.7	-2.6	-1.9
Transport equipment, nes	-7.1	22.4	-10.3	-7.7	-8.3	-10.4	-12.5	-0.8	-8.8	-6.7	-9.9	-8.7
Memo items:												
Agriculture and mining												
Grains and crops	3.6	7.7	-1.6	-0.1	-0.5	-1.3	-0.1	-0.3	-0.5	-0.2	-0.9	-0.6
Forestry and fishing	3.9	3.7	-1.4	0.7	0.3	-0.1	1.1	0.3	0.4	0.3	-0.6	0.5
Mining	-2.3	6.8	-1.3	0.0	0.3	-0.6	0.5	3.0	1.0	1.8	1.4	-0.3
Utilities and services												
Utilities and construction	3.3	-2.4	5.8	1.3	5.4	5.7	4.2	1.5	3.8	4.4	8.8	5.2
Trade and transport	1.6	-1.5	0.3	-0.2	-0.6	0.4	-0.2	-0.8	-0.5	-0.1	0.3	0.1
Commercial services	1.6	-0.6	-0.2	-0.5	0.4	0.2	-0.5	-0.6	-0.3	-0.9	-0.8	-0.3
Other services	8.6	-5.7	0.4	-0.3	0.3	-0.2	-0.7	0.2	-0.4	0.0	-0.1	-0.1

Source: Author's calculations, based on GTAP simulations; and UNIDO, *Industrial Statistics* database, CD-ROM 2009.

Note: The data in the table refer to percentage changes in the demand for unskilled labour relative to 2008. The percentage changes in the demand for skilled labour are very similar, and thus are not shown. Industrial goods are listed by increasing labour intensity, measured as the unweighted world average of the share of wages and salaries in sectoral value added during the period 1995–2005.

nes = not elsewhere specified.

a Excluding the Republic of Moldova.

The adverse effects of global rebalancing for trade flows and employment generation in industrial sectors reported above would be mitigated if other surplus economies, particularly Germany, were also rebalancing. Ongoing stagnation of private consumption in Europe and the tendency to embark on perhaps premature fiscal consolidation programmes strongly reduces the probability of such a scenario to occur. Nevertheless, it may be useful to examine the trade and employment effects that would result if in Germany the share of consumption in GDP increased by 10 percentage points and reached the historic level in the United States of about 66 per cent. This increase in Germany's consumption would compensate the second half of the decline in United States consumption, i.e. the part of that decline which would be left uncompensated by the increase in China's consumption.[30] Contrary to the bilateral rebalancing scenario examined above, it may also be assumed that such a multilateral rebalancing would not reduce the rate of GDP growth in the United States.[31]

On these assumptions, Germany's trade balance would deteriorate by more than 10 percentage points of GDP to reach a deficit of about 5 per cent of GDP.[32] This outcome is unlikely to be acceptable for Germany's policymakers.[33] Nonetheless, this scenario helps to illustrate the effects of global rebalancing that occurs in a multilaterally coordinated way and involves both the major deficit country, i.e. the United States, and major surplus countries, i.e. China and Germany. In this setting, adjustment in Germany could be sizeably reduced, and the adjustment burden made more acceptable, if other developed country surplus economies, such as Japan, also contributed to global rebalancing in such a way that the decline in United States consumer demand would be fully compensated by an increase in consumer demand in the surplus countries.

To highlight the differences between bilateral and multilateral rebalancing, it is useful to compare the impact on trade flows and employment generation of such a multilateral rebalancing scenario, which are shown in figure 14, with those resulting from rebalancing confined to China and the United States, which was discussed above (figure 13). Multilaterally coordinated rebalancing would lead to a smaller decline in world exports of industrial goods (as indicated by the fact that the data points in the bottom half of figure 14 are closer to the horizontal axis than those in figure 13) and the most adversely affected industrial sectors would not regard the traditional labour-intensive export sectors of developing countries, such as apparel, leather and textiles. This means that a multilaterally coordinated rebalancing would sizeably reduce the adverse effects on export opportunities and employment creation in the industrial sectors of developing countries.

---

[30] Given that Germany's GDP is about one fourth that of the United States, this 10 percentage point increase in Germany's share of consumption in GDP is about half of what would be required to compensate for the 5 percentage decline in the United States' share of consumption on GDP, assuming no change in the level of GDP in either country. Regarding China, see footnote 38 below.

[31] In any case, the effects of this assumption are small compared to those caused by changes in the shares of consumption in GDP. The estimation results that support this finding are available from the author on request.

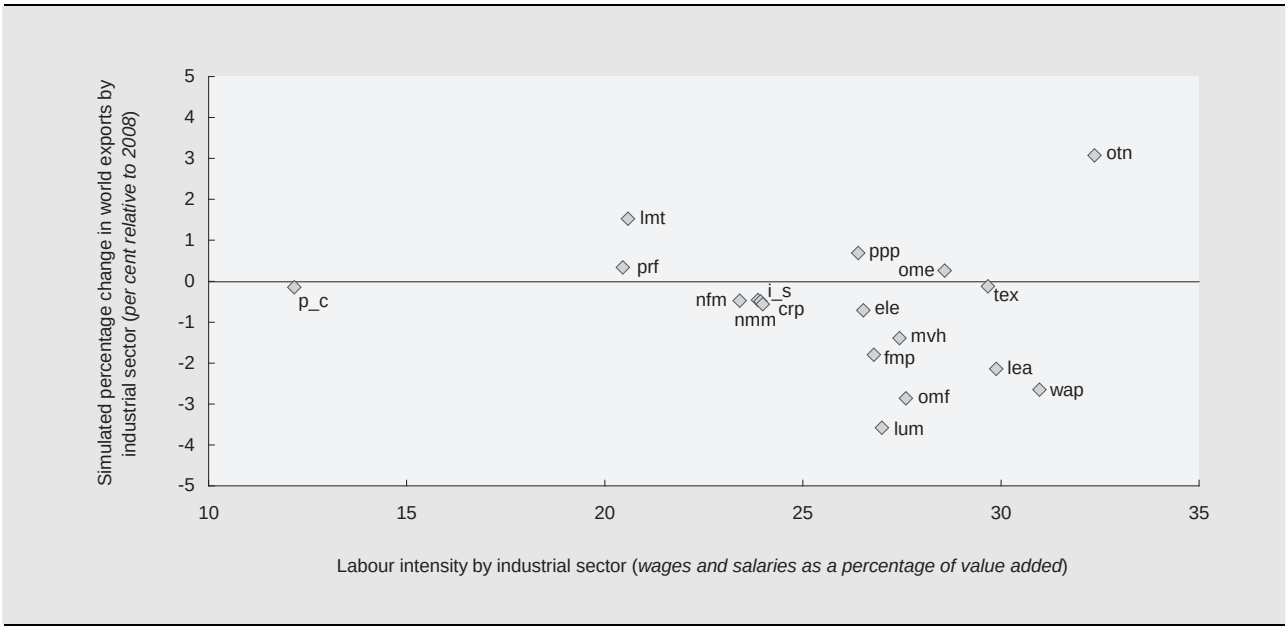
[32] Overall, this scenario implies that countries' trade balances deteriorate by about 0.7 percentage points of GDP less than in the scenario that confines rebalancing to China and the United States. This smaller decline is the combined effect of smaller increases in imports (about 1/3 of the total effect) and smaller reductions in exports (about 1/3 of the total effect).

[33] This shift also implies that the prices of primary factors in Germany would increase by about 7 percentage points more than in the group "Rest of EU-25 and EFTA". Given that this group includes all those countries that in addition to Germany form the Euro-area, there is limited scope for exchange rate changes to bring about this adjustment. Hence, wages would need to increase significantly faster in Germany than in the other countries of the Euro-area.

Figure 14

LABOUR INTENSITY AND GTAP SIMULATION RESULTS FOR CHANGES IN WORLD EXPORTS BY INDUSTRIAL SECTOR CAUSED BY REBALANCING IN THE UNITED STATES, CHINA AND GERMANY

(Per cent)



Source: See figure 13.
Note: See figure 13.

However, in spite of the assumed full compensation of the decline in United States consumption by an opposite development in China and Germany, world exports of industrial goods would decline (as indicated by the fact that the majority of data points in figure 14 are below the horizontal axis). Indeed, as indicated above, the absolute level of consumer spending is only one element that determines consumer good imports. Another one is the similarity of consumer good imports across countries. While the basket of consumer good imports in Germany is fairly similar to that of the United States, this is not the case for China (figure 9). The perhaps most important element in this context regards differences in the import intensity of consumption and exports in different countries. As indicated above, in China the import intensity of exports is much larger than that of consumption, as well as much larger than that of United States exports. Hence, a rebalancing from exports to consumption in China and from consumption to exports in the United States would cause an overall decline in imports. The result of rebalancing in the United States and Germany would go in the same direction. The import intensity of consumption in the United States is about one half that in Germany, while the same proportion is about one third for exports, as already mentioned. This means that the combined effect of a shift from exports to consumption in Germany and a shift from consumption to exports in the United States would also be an overall reduction in imports.

VI. CONCLUSIONS

Cross-country differences in the rate of economic growth, as well as differences in the contribution of domestic consumption and exports to these growth rates, have played a key role in the accumulation of substantial current-account imbalances in the world economy. Such differences will also be of crucial importance for the reduction in global imbalances.

Much of the debate on the causes of global imbalances, as well as on policies to be adopted for their reduction, has emphasized a bilateral perspective, focusing on China and the United States. One reason for this may have been that in these two countries important economic aggregates have developed in opposite directions: household consumption of a share in GDP increased in the United States but decreased in China, and trade accounts recorded sizeable deficits in the United States but surpluses in China.

These developments, combined with the unprecedented boom of primary commodity prices between 2002 and mid-2008, were of an overall expansionary nature. They contributed to sustained output growth in the world economy for several years in the lead-up to the current crisis. Equally important, the favourable external economic environment in the years before 2008 allowed output growth in developing countries to be relatively balanced in terms of sectoral contributions. In many of these countries, output growth in agriculture, extractive industries and services recorded rates almost as high as manufactured output.

A reduction in global imbalances will have sizeable effects for the path of economic development in many developing countries. Simulations indicate that the net effect of a return to historic averages of the share of household spending in GDP in China and the United States for the world economy would be deflationary. This implies a deterioration of the external economic environment for developing countries. At the same time, adjustments limited to China and the United States would be insufficient for the unwinding of global imbalances. Adjustment will be necessary also in some other countries, particularly those with large external surpluses. The evolution of the current-account surpluses of the Russian Federation, Saudi Arabia and other oil exporters has been determined largely by oil-price developments; besides, the size of these countries' domestic demand is not large enough to influence global trade flows and employment creation. The import potential of other, relatively large, developing countries (such as Brazil, India, Indonesia and South Africa) is also relatively small, even when combined. And, in any case, in none of these countries has the current account been in surplus in recent years. Germany and Japan have been the two large developed countries that have recorded large, and more long-lasting, current-account surpluses. The large size of these two economies, the similarity between their basket of imported consumer goods and that of the United States, and the fact that domestic demand has grown notoriously slowly in these economies, would place them well for supporting the reduction in global imbalances. However, ongoing stagnation of private consumption in Europe, exacerbated by the tendency to embark on perhaps premature fiscal consolidation programmes, make it unlikely that any sizeable contribution in that direction will come from the European surplus economies. Nevertheless, simulations indicate that multilaterally coordinated rebalancing would reduce the adverse impact on trade flows and employment generation in industrial sectors.

With regard to China's increasingly important role as an engine of global growth, there is a risk that a shift from an investment- and export-led growth path to a more consumption-led growth path might imply sizeable adverse effects on the country's rate of economic growth and employment creation. It might even imply an experience of prolonged economic stagnation, such as that of Japan during the 1990s. Indeed, the current debate on global rebalancing and the associated trade- and currency-related tensions between the United States and China often takes up arguments that in many respects are reminiscent of similar tensions between the United States and Japan in the 1980s. These arguments point to the alleged undervaluation of the exchange rate; inflated asset prices, which are feared to eventually cause sharp declines in equity and real estate markets; overinvestment and excessive bank lending, which may result in non-performing loans and disruptions of the financial system (The

Economist, 2010). After the appreciation of the Yen following the Plaza agreement in 1985, Japan suffered deflation, stagnation, bank insolvency and excessive public deficits and debt that resulted in severe unemployment and detracted foreign investment.

However, in spite of very rapid income growth over the past three decades, China today remains much poorer than Japan was in the 1980s and probably still has tremendous scope for internal development and a much higher long-term growth potential. This remaining greater room for catch-up growth, combined with its strong fiscal and external positions, would make it easier to recover even if China were to experience asset-price deflation and the ensuing economic problems that Japan has been experiencing over the past two decades. There are also indications that points to a gradual slow-down in the growth of China's pool of surplus labour. This could cause real wage relative to productivity to increase faster than in the past, with attendant positive effects on household consumption and economic growth.

As long as China's robust growth trajectory remains in tact and investment in the country's large infrastructure projects are pursued, its raw material imports are likely to remain strong as well. This will support direct exports to China, as well as put a floor under prices of primary commodities, especially energy and metals. Thus, countries for which buoyant exports of primary commodities were supporting rapid economic growth prior to the crisis are likely to experience only marginal adverse effects from global rebalancing.

By contrast, developing countries in East and South-East Asia are likely to experience the greatest pressure for economic adjustment. An important pillar of their development strategies over the past two or three decades has been participating in global value chains that produce goods for consumption in developed-country markets, mainly the United States. Participation in these value chains by developing countries in East and South-East Asia has increasingly implied producing intermediate products for exports to China where they would be finished and shipped to the United States. Rebalancing in China will severely reduce the role of China as the world's workshop of globally consumed goods, and rebalancing in the United States will severely reduce global demand for goods produced in such global value chains. Evidence for 2008 and 2009 in fact indicate that buyer-led global value chains, which are most prominent in consumer-good sectors, have undergone substantial consolidation. More importantly, in an overall shrinking market, this consolidation has implied an increase in China's share in United States markets and a substantial loss in market share for East and South-East Asian producers, such as Cambodia, Malaysia and Thailand (Milberg and Winkler, 2010).

It is unlikely that East and South-East Asian developing countries will be able to replace the United States by other destination markets. The markets of other developing countries remain much smaller, and Chinese producers probably can satisfy the large Chinese markets through domestic production. European markets, which would be placed best to compensate falling imports from declining household consumption in the United States, are serviced by other global value chains that extent to Eastern Europe. Hence, developing countries in East and South-East Asia may need to follow economic rebalancing in China and reorient their development strategy towards a greater role of domestic demand as well. Successful policymaking in the aftermath of the Asian crisis in 1997 has shown that these economies can manage sizeable adjustments. But it is less clear whether this would allow them to maintain robust growth. Some of these economies are relatively small. And it has been widely recognized that exporting manufactures may provide dynamic development benefits that are difficult to attain through other activities (see, e.g. Korinek and Serven, 2010). Hence, global rebalancing may well require a general rethinking of development strategies.

ANNEX 1

TECHNICAL NOTE ON THE SIMULATION OF THE TRADE AND EMPLOYMENT EFFECTS OF GLOBAL REBALANCING

The simulation employs the standard model of the Global Trade Analysis Project (GTAP) – a computable general equilibrium model of the global economy which emphasizes the role of intersectoral factor mobility in determining sectoral output supply, and which assumes output to be produced with constant returns to scale.[34] The model also assumes product differentiation between imported and domestic goods, and among imports from different regions. This assumption allows for two-way trade in each product category, depending on the ease of substitution between products from different regions. The model's demand system allows for differential price and income responsiveness across countries. It also includes differences in import intensities across spending by economic agents (firms, households and governments) and across countries.[35] An assumed 'global' bank mediates world savings and investment. In addition to five production factors (land, capital, unskilled and skilled labour,[36] and natural resources), the GTAP database covers 113 countries (or regions) and 57 product sectors, which for this simulation have been aggregated to 25 regions and 25 sectors (see tables 1 and 2).

The simulation assumes:[37] (i) a 5 percentage point decline in United States consumption as a share of GDP (i.e. equivalent to the difference in 2008 between the actual share and the long-term average share as shown in figure 2 above); and (ii) a 7 percentage point increase in China's household consumption as a share of GDP (i.e. equivalent to the decline between 2005 and 2008 as shown in figure 3 above).[38] In technical terms, conducting simulations based on these assumptions requires, for both the United States and China: (i) the variable 'private consumption expenditure (*yp*)' to become exogenous and the 'private consumption distribution parameter (*dppriv*)' to become endogenous; and (ii) the 'savings distribution parameter (*dpsave*)' to become exogenous and the 'average distribution parameter shift (*dpav*)' to become endogenous. These two modifications ensure that any change in the share of income used for private consumption will be reflected entirely in changes in the share of savings in income.

---

[34] For documentation of the model, see Hertel (1997), and for the GTAP-7 database, see Narayanan and Walmsley, 2008.

[35] Broadly in line with what is discussed in section 4, the model's demand system implies, for example, that the import intensity of government spending is lowest, followed by that of households, and then by that of firms, for which the import intensity is particularly large in countries with a high share of exports in GDP, such as those in East and South-East Asia. The model's demand system also implies that the import intensity of consumption spending in the United States is two to three times larger than that in China, yet only about half to one third that in the member states of the European Union.

[36] In the GTAP-model, the split between skilled and unskilled labour is based on occupational data. Skilled labour refers to professional workers (managers and administrators, professionals and para-professionals), while unskilled labour refers to production workers (tradespersons, clerks, salespersons and personal service workers, plant and machine operators and drivers, labourers and related workers, and farm workers). The relationship between the wages of skilled and unskilled workers in the GTAP-model is determined on the basis of an econometric estimation, as explained in Dimaranan and Narayanan, 2008.

[37] Similar assumptions underlie the simulation exercise in Zhang, Zhang and Han (2010) who, however, use a different simulation model and focus on financial linkages rather than trade linkages which this chapter emphasizes.

[38] Given that China's GDP is about one third that of the United States, this 7 percentage point increase in China's share of consumption in GDP is about half of what would be required to compensate for the 5 percentage decline in the United States' share of consumption on GDP, assuming no change in the level of GDP in either country.

The simulation further assumes: (iii) a reduction in the United States' potential output by 1 percentage point relative to 2008 (i.e. the starting point of the simulation). This reduction is implemented by assuming a respective decline in output-augmenting technological change. The motivation for this assumption is that the decline in household consumption leads to a reduction in aggregate domestic demand in the United States. In the short term, this adverse demand impact may be limited by expansionary government spending which, however, in the medium term is unsustainable for fiscal reasons. Hence, over the medium term, the decline in household spending cannot be compensated in a sustainable manner by an increase in another element of aggregate demand. This slowdown in United States domestic demand, in turn, has spillover effects on other economies, since a greater emphasis on consumption-led growth relative to export-led growth in China and a shift in the opposite direction in the United States would reduce aggregate imports of these countries from the rest of the world. In other words, global rebalancing confined to adjustment in the United States and China would remove the demand stimulus that, prior to the outbreak of the current crisis, the United States was providing to the world economy without replacing it with a stimulus of similar size from increased consumption in China, as already mentioned in the main text.

The GTAP model's most updated database refers to 2004. Given that both global current-account imbalances and the share in GDP of consumption in China and the United States have changed significantly since 2004, the ratios of trade balances to income were updated to 2008 (i.e. roughly the onset of the current global economic and financial crisis). More precisely, each region's current-account balance as a share of income was updated on the basis of the respective growth rates between 2004 and 2008, calculated from the IMF's *World Economic Outlook* database. This was done by treating the change in the ratio of the trade balance on goods and services to regional income (*dtbalr*) as an exogenous variable, and the slack variable that represents the risk premium on investment (*cgdslack*) as an endogenous variable. These modifications cause investment to adjust such that it compensates for the assumed changes in the trade balance, thus ensuring that the savings-investment balance equals the trade balance. Given that the sum of all regions' trade balances must be zero, so that *dtbalr* cannot be treated as exogenous for all regions, the trade balances of two groups (West Asia and North Africa and Rest of the World) were left to be determined endogenously. This methodology may be considered broadly equivalent to simulating a shock to real exchange rates. The simulation uses this updated database as the baseline scenario (i.e. the benchmark against which the impact of the assumed changes is measured). To test the robustness of the results obtained in this way, the simulation was run also on the original 2004 database with adjustment in United States consumption assumed to be equivalent to 4 percentage points and that in China's consumption equivalent to 5 percentage points. While the changes resulting from this alternative simulation are quantitatively smaller, partly because the underlying current-account imbalances in 2004 were smaller than in 2008, they are qualitatively identical.

Simulations were undertaken for a scenario that assumes adjustments in the United States and China occur at the same time (the results of which are reported in the main text), as well as with a scenario that assumes adjustments occur separately in China and the United States. Doing so gives some indications as to the importance of adjustment in either of these two countries for global rebalancing. The results for the scenario in which adjustment is confined to China (table A1) indicate that the assumed increase in the share of China's consumption in GDP would have a minor impact on trade flows for individual countries, except for China itself. They also indicate that the countries in East and South-East Asia taken together would benefit the most. This latter finding is probably due to the fact that these countries and China are part of the same international production networks, so that the simulated adjustments, helped by an appreciation of the renminbi by about 5 per cent, would imply a relocation of the exit point of these networks from China to other developing countries in the region. This finding also mirrors the results generally obtained from GTAP models that simulate an increase in China's exports, where adverse effects are usually concentrated in the other Asian developing countries (UNCTAD, 2002: chapter V).

Table A1

GTAP SIMULATION RESULTS OF THE IMPACT OF REBALANCING IN CHINA ON TRADE FLOWS AND FACTOR PRICES, SELECTED COUNTRIES AND COUNTRY GROUPS

	Change in trade balance	*Share of trade balance in GDP*	*Change in export volume*	*Change in import volume*	*Change in terms of trade*[a]	*Appre-ciation*[b]	*Change in wages*[c]	
							Unskilled labour	*Skilled labour*
	(Percent-age points)	*(Per cent)*						
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
China	-6.7	3.4	-14.6	2.9	2.8	4.8	4.3	6.4
China, Hong Kong SAR	0.2	16.5	0.1	-0.3	-0.1	0.4	0.5	0.4
China, Taiwan Province of	0.2	15.5	0.1	-0.2	0.0	0.2	0.2	0.1
Indonesia	0.2	2.2	0.5	-0.2	-0.1	0.2	0.2	0.1
Malaysia	0.3	44.3	0.0	-0.3	-0.1	0.1	0.0	-0.1
Philippines	0.3	5.3	0.3	-0.3	-0.1	0.0	0.0	-0.1
Republic of Korea	0.3	3.5	0.6	-0.3	-0.2	-0.1	-0.2	-0.2
Singapore	0.3	-0.6	0.1	-0.2	-0.1	-0.2	-0.2	-0.2
Thailand	0.7	10.3	0.6	-0.5	0.0	0.0	0.0	-0.1
Rest of East and South East Asia	0.4	4.0	0.4	-0.4	-0.2	0.1	0.0	-0.2
India	0.2	-6.3	1.1	-0.3	-0.1	0.0	0.0	-0.1
South Asia, excl. India	0.2	-15.6	0.9	-0.4	0.0	0.0	0.0	-0.1
West Asia and North Africa	0.2	15.6	0.3	-0.3	-0.1	-0.1	0.0	-0.1
Sub-Saharan Africa	0.3	3.3	0.4	-0.6	-0.2	-0.1	-0.1	-0.2
Argentina and Brazil	0.3	2.8	1.3	-0.5	-0.1	-0.2	-0.2	-0.3
Mexico	0.2	0.2	0.7	-0.1	0.0	-0.1	-0.1	-0.2
Rest of developing America	0.3	0.1	0.6	-0.4	-0.1	-0.1	-0.1	-0.2
Canada	0.2	-0.8	0.6	-0.2	-0.1	-0.1	-0.2	-0.2
United States	0.2	-4.4	1.4	-1.2	-0.4	-0.3	-0.3	-0.3
Germany	0.3	6.0	0.6	-0.5	-0.2	-0.2	-0.2	-0.2
Rest of EU-25 and EFTA	0.3	-1.6	0.6	-0.4	-0.1	-0.2	-0.2	-0.2
Australia and New Zealand	0.3	-0.1	0.9	-0.6	-0.2	-0.1	-0.1	-0.1
Japan	0.4	1.4	2.0	-1.7	-0.7	-0.4	-0.4	-0.4
CIS, excl. the Republic of Moldova	0.1	7.5	0.3	-0.2	-0.1	-0.1	-0.1	-0.1
Rest of the world	0.3	-7.5	0.5	-0.2	0.0	-0.1	-0.1	-0.2

Source: Author's calculations.

Note: All changes are relative to 2008.

a An improvement in the terms of trade indicates that the price of exports increased more (or fell less) than the price for imports.

b An appreciation indicates an increase in the price for primary factors, which may be likened to an appreciation of the real exchange rate.

c For the definition of skilled and unskilled labour and the wage ratio between skilled and unskilled labour, see footnote 36.

Given the relatively small overall impact of adjustment when confined to China, it is no surprise that the results for the scenario in which adjustment is confined to the United States (not shown) are similar to those for the scenario that assumes simultaneous adjustments in China and the United States, shown in table 1. The only major difference is that the impact on China's trade balance in the scenario where adjustment is confined to the United States is much smaller than in the scenario in which adjustment occurs in both countries at the same time. The fact that the impact on China also is significantly smaller than for the vast majority of the other regions shown in table 1 suggests that the United States trade deficit is indeed multilateral in nature, rather than the result of bilateral trade flows between the United States and China. In terms of employment, these results suggest that rebalancing China's growth trajectory will do little for other developing countries in terms of compensating for adverse effects stemming from adjustment in the United States. This is because China imports mainly intermediate goods (including parts and components), and primary commodities (primarily energy products and metals), which are not very employment intensive.

ANNEX 2

ALTERNATIVE VIEWS ON THE CAUSES OF GLOBAL IMBALANCES AND THEIR REMEDIES

The causes of global imbalances and policies to correct them have been the subject of numerous studies (for surveys see Mann, 2002, and Yu, 2007). Alternative views differ in how they look at the following accounting identity:

$$CA = X - M + NFI = S^N - I = \Delta NFA,$$

where *CA* is the current-account balance, *X* and *M* are exports and imports of goods and services, *NFI* is the balance on income (net foreign incomes from abroad), S^N is national saving, *I* is national investment, and ΔNFA are changes in net foreign assets. The identity states that a country is running a current-account surplus when the sum of its trade balance (*X-M*) and its net foreign incomes (*NFI*) is positive. This implies an excess of national savings over national investment and an accumulation of net foreign assets.

Three different perspectives on the current account may be distinguished on the basis of the above identity (Mann, 2002): (i) an international perspective which emphasizes the flows and holdings of financial assets and considers the current-account balance as being determined by the portfolio choices of private financial investors and official reserve holders that drive international capital flows; (ii) an international perspective which focuses on flows of trade in goods and services; and (iii) a national perspective which examines national income and product accounts, focusing on savings and investment, and sees the current account as driven by national savings-investment imbalances. Each of these three perspectives provides different lenses for an analysis of the accounting identity where one or the other perspective may be particularly useful under certain circumstances or time frames.

Over the past few years, the most popular expression of the first perspective has been the 'savings glut' hypothesis (Bernanke, 2005). In this view, global imbalances are caused by savings decisions. More precisely, they result from a combination of demographics (i.e. the problem of aging populations in developed countries), rapid economic growth, high oil prices, and financial development which encourage savings outside the United States (mainly in East Asia, particularly Japan and China; oil-exporting countries, mainly those in West Asia, but also Nigeria, the Russian Federation, and Venezuela; and some other countries, especially Germany). These savings flow to the United States because of the great diversity of financial assets and instruments available on its financial markets, the role of the dollar as an international currency, and the fact that United States financial assets represent "claims on a robust, innovative economy offering good returns, liquidity security and relative stability" (Cooper, 2008: 246). From this perspective, the large inflows of credit into the United States sparked a consumption boom and subsequent large current-account deficits.

The second perspective emphasizes trade flow dynamics driven by United States and other countries' income growth and changes in relative prices. Exchange rates play a key role in this perspective. The most important strand of this viewpoint sees the origin of global imbalances in the misalignment of real exchange rates, particularly between the dollar and East Asian currencies, resulting mainly from alleged "currency manipulation" by China for maintaining an undervalued renminbi. This view implies that the cause of the United States trade deficit is its bilateral deficit with China. However, there is little evidence for this contention, because prior to the current crisis the United States trade deficit had been increasing with every major region of the world. It may, therefore be described as a multilateral rather than a bilateral (United States versus China) phenomenon. Moreover, the strong divergence of per capita income levels between the two countries implies that the United States is no longer producing the goods that it imports from China. As a result, if it reduced imports from China, it

would probably have to replace these by imports from other, possibly higher cost sources, which would thus lead to an even higher trade deficit in the United States.

Another strand within this perspective points to shortcomings in global economic governance. The absence of a global exchange-rate system, combined with widespread liberalization of capital flows, enabled developing countries to maintain their exchange rates at competitive levels in order to pre-empt speculative attacks on their currencies. The resulting interventions on foreign-exchange markets resulted in the accumulation of vast foreign-exchange reserves, which were invested mainly in dollar-denominated Treasury bills and which provided self-insurance against potential adverse effects from a sudden stop or reversal of capital inflows. To the extent that this self-insurance strategy is adopted by countries that are also pursuing an export-oriented development strategy, such as many countries in Asia, it will result in trade surpluses (Dooley, Folkerts-Landau and Garber, 2004; Aizenman, 2007). These outcomes may appear to stem from developing countries' development strategies, but in reality they are more likely due to shortcomings in global economic governance.

The third perspective highlights patterns of domestic savings and investment as reflected in countries' trade and current-account balances. Contrary to the previous perspective, it sees trade flows as being driven mainly by relative demand factors, rather than just by relative prices. In other words, it sees international trade in goods and services as responding, in a comparatively passive fashion, to domestic demand factors as reflected in national accounts. Cross-country differences in the rate of economic growth play an important role in this perspective. The link between domestic demand factors and international trade can be further examined considering that the above identity requires the *ex-post* equality of the savings-investment balance of the United States – or any other individual country – and the rest of the world (ROW), expressed as follows:

$$S_{US}^{N} - I_{US} = I_{ROW} - S_{ROW}^{N}$$

This indicates that an excess of investment over savings in the United States (i.e. a current-account deficit in the United States) must *ex post* be equal to the excess of savings over investment in the rest of the world (i.e. a current-account surplus of the rest of the world). National savings are the sum of government and private savings, where the latter can be further disaggregated in household and corporate savings (i.e. retained profits).

A focus on the left-hand side of the equation designates a decline in national savings of the United States as the major cause of global imbalances.[39] Given that global imbalances have been perceived as a major issue only since about 2002 and that this date coincides with the beginning of the expansionary fiscal stance of the United States Government, the debate on global imbalances has sometimes centred on "twin deficits" – the simultaneous occurrence of fiscal and current-account deficits (Roubini and Setser, 2005).[40]

However, evidence of a statistically significant, long-term, positive co-movement of the budget and the current-account balances in the United States is tenuous (Cooper, 2008). Moreover, there is wide agreement that this relationship is weak in absolute terms. As noted by Bagnai (2009: 510), several studies (e.g. Chinn and Ito, 2007) indicate that a reduction of the fiscal deficit by one percentage point

[39] A focus on the right-hand sight would be similar to the "savings-glut" hypothesis, which suggests that buoyant foreign demand for United States financial assets forces that country to live beyond its means.

[40] This year also marks the beginning of the depreciation of the dollar against most other major currencies, which, from the perspective of the "savings glut" hypothesis may be seen as a lower willingness of private and official holders of dollar-denominated assets to continue financing the United States current-account deficits. The associated risk that a diversification away from dollar-denominated assets occurring in a disorderly manner and causing a sharp dollar depreciation is what prompted concerns about the sustainability of global imbalances.

of GDP leads to an improvement in the current account balance of only about one third of a percentage point of GDP. Accordingly, even if the United States had drawn down its fiscal deficit of about 3 per cent of GDP to zero prior to the current crisis, its current-account deficit of about 5.5 per cent of GDP would have shrunk by a mere 1 percentage point of GDP (other things being equal). In other words, an effective rebalancing of the United States savings-investment balance cannot occur without considerable involvement of the private sector in terms of interrupting the secular decline in its saving rate or, what is equivalent, interrupting the secular increase in its consumption rate. The opposite would hold for surplus countries.

REFERENCES

Aizenman J (2007). Large hoarding of international reserves and the emerging global economic architecture. Working Paper No. 13277, National Bureau of Economic Research. Cambridge, MA, July.

Akyüz Y (2010). Export dependence and sustainability of growth in China and the East Asian production network. Research Paper No. 27, South Centre, Geneva.

Aziz J and Cui L (2007). Explaining China's low consumption: the neglected role of household income. Working Paper No. 07/181, International Monetary Fund. Washington, DC, July.

Bagnai A (2009). The role of China in global external imbalances: some further evidence. *China Economic Review*, 20(3): 508–526.

Bai C and Qian Z (2009a). Who is the predator, who the prey? An analysis of changes in the state of China's national income distribution. *Social Sciences in China*, 30(4): 179–205.

Bai C and Qian Z (2009b). Changes in factor income distribution in China: Facts, reasons, and policy responses. Presentation made at the Stanford Center for International Development's China Mirror Conference 2009, Tsinghua University, 13 April. Available at http://scid.stanford.edu/system/files/shared/Factor_Income_Share_English.pdf.

Bank for International Settlement (BIS) (2007). *Annual Report 2007*. Basel.

Barba A and Pivetti M (2009). Rising household debt: its causes and macroeconomic implications – a long-period analysis. *Cambridge Journal of Economics*, 33(1): 113–137.

Bernanke B (2005). The global saving glut and the US current account deficit. Speech delivered for the Sandridge Lecture, Virginia Association of Economists, Richmond, VA, 10 March.

Blanchard O and Giavazzi F (2006). Rebalancing growth in China: A three-handed approach. *China and World Economy*, 14(4): 1–20.

Carroll CD and Slacalek J (2009). The American consumer: reforming, or just resting? Working Paper No. 2009/12. Frankfurt Center for Financial Studies, Frankfurt University, June.

Chinn MD and Ito H (2007). Current account balances, financial development and institutions: Assaying the world "savings glut". *Journal of International Money and Finance*, 26(4): 546–569.

Cooper R (2008). Understanding global imbalances. In: Little JS, ed. *Global Imbalances and the Evolving World Economy*. Boston, MA, Federal Reserve Bank of Boston.

De Mello L and Padoan PC (2010). Are global imbalances sustainable? Post-crisis scenarios. Economic Department Working Paper No. 795. Organisation for Economic Co-operation and Development, Paris.

Dimaranan BV and Narayanan BG (2008). Skilled and Unskilled Labor Data. In: Center For Global Trade Analysis, ed. *GTAP 7 Data Base Documentation*. West Lafayett, IN, Purdue University. Available at https://www.gtap.agecon.purdue.edu/resources/download/4183.pdf.

Dooley MP, Folkerts-Landau D and Garber P (2004). The revived Bretton Woods System: the effects of periphery intervention and reserve management on interest rates and exchange rates in center countries. Working Paper No. 10332, National Bureau of Economic Research. Cambridge, MA.

EIU (Economist Intelligence Unit) (2010). *Country Forecast*: *China*. London, April.

Glick R and Lansing KJ (2010). Global household leverage, house prices, and consumption. *Economic Letter* 2010-01, Federal Reserve Bank of San Francisco, 11 January.

Hertel TW (ed.) (1997). *Global Trade Analysis: Modeling and Applications*. Cambridge, Cambridge University Press.

Hung HF (2009). America's head servant? New Left Review, 60: 5–25, November-December.

IMF (2004). The global implications of the U.S. fiscal deficit and of China's growth. *World Economic Outlook*, chapter 2, April.

IMF (2005): Globalization and external imbalances. *World Economic Outlook*, chapter 3, April.

IMF (2010). Getting the balance right: Transitioning out of sustained current account surpluses. *World Economic Outlook*, chapter 4, April.

JPMorgan (2010). China: Rising wages not expected to trigger spike in CPI. Economic Research Note, Global Data Watch, 5 March.

Knight J (2007). China, South Africa and the Lewis model. Research Paper No. 2007/82, United Nations University, World Institute for Development Economics Research, Helsinki.

Korinek A and Serven L (2010). Undervaluation through foreign reserve accumulation. Static losses, dynamic gains. Working Paper No. 5250, World Bank, Washington, DC, March.

Kranendonk H and Verbruggen J (2008). Decomposition of GDP-growth in some European countries and the United States. CPB Memorandum 203. Netherlands Bureau for Economic Policy Analysis.

Lardy N (2009). Statement at the Hearing before the U.S.-China Economic and Security Review Commission on China's Role in the Origins of and Response to the Global Recession, Washington, DC, 17 February.

Lee J, Rabanal P and Sandri D (2010). U.S. consumption after the 2008 crisis. IMF Staff Position Note SPN/10/01. International Monetary Fund, Washington, DC.

Lett E and Banister J (2009). China's manufacturing employment and compensation costs: 2002–06. *Monthly Labor Review*: 30–38, April.

Mann C (2002). Perspectives on the U.S. current account deficit and sustainability. *Journal of Economic Perspectives*, 16(3): 131–152.

Maury T and Pluyaud B (2004). Breaks in per capita productivity trends in a number of industrial countries. Working Paper No 111, Banque de France, Paris.

McKinsey Global Institute (2009). If you've got it, spend it: Unleashing the Chinese consumer. Seoul, McKinsey & Company, August.

Milberg W and Winkler D (2010). Trade crisis and recovery. Working Paper No. 5294. World Bank, Washington, DC, May.

Mitchell T and Dyer G (2010). Inflation surge spurs fears of Chinese wage increases. *Financial Times*, 8 February.

Modigliani F and Cao S (2004). Chinese saving puzzle and the life-cycle hypothesis. *Journal of Economic Literature*, 42(2): 145–170.

Narayanan B and Walmsley TL (eds.) (2008). *Global Trade, Assistance, and Production: The GTAP 7 Data Base*. West Lafayett, IN, Center for Global Trade Analysis, Purdue University. Available at https://www.gtap.agecon.purdue.edu/databases/v7/v7_doco.asp.

Park A, Cai F and Du Y (2010). Can China meet her employment challenges? In: Oi JC, Rozelle S and Zhou X, eds. *Growing Pains: Tensions and Opportunity in China's Transformation*. Stanford, Walter H Shorenstein Asia-pacific Research Center Books.

Rajan R and Subramanian A (2006). What undermines aid's impact on growth? Working Paper No. 11657, National Bureau of Economic Research, Cambridge, MA, September.

Roach S (2009). Statement at the Hearing on China's Role in the Origins of and Response to the Global Recession before the U.S.-China Economic and Security Review Commission, Washington, DC, 17 February.

Roubini N and Setser B (2005). The sustainability of the US external imbalances. *CESifo Forum*, 1/2005: 8–15.

The Economist (2010). China's misunderstood economy, 14 January.

United Nations (1971). Classification by Broad Economic Categories. Statistical Papers, Series M, No. 53. Sales No. E.71.XVII.12. New York, NY.

United Nations (2010). *World Economic Situation and Prospects 2010*. Update as of mid-2010. New York, NY. Available at http://www.un.org/esa/policy/wess/wesp2010files/wesp10update.pdf.

UNCTAD (various issues). *Trade and Development Report*. United Nations publications, New York and Geneva.

Yang DT, Chen V and Monarch R (2009). Rising wages: Has China lost its global labor advantage? Economics Program Working Paper No 09-03, The Conference Board, New York, NY.

Yu Y (2007). Global imbalances and China. *Australian Economic Review*, 40(1): 3–23.

Zhang W, Zhang Z and Han G (2010). How does the US credit crisis affect the Asia-Pacific economies? Analysis based on a general equilibrium model. *Journal of Asian Economics*, 21 (3): 280–292.

UNCTAD DISCUSSION PAPERS

No.	*Date*	*Author(s)*	*Title*
199	June 2010	Ugo Panizza Federico Sturzenegger Jeromin Zettelmeyer	International government debt
198	April 2010	Lee C. Buchheit G. Mitu Gulati	Responsible sovereign lending and borrowing
197	March 2010	Christopher L. Gilbert	Speculative influences on commodity futures prices 2006–2008
196	November 2009	Michael Herrmann	Food security and agricultural development in times of high commodity prices
195	October 2009	Jörg Mayer	The growing interdependence between financial and commodity markets
194	June 2009	Andrew Cornford	Statistics for international trade in banking services: Requirements, availability and prospects
193	January 2009	Sebastian Dullien	Central banking, financial institutions and credit creation in developing countries
192	November 2008	Enrique Cosio-Pascal	The emerging of a multilateral forum for debt restructuring: The Paris Club
191	October 2008	Jörg Mayer	Policy space: What, for what, and where?
190	October 2008	Martin Knoll	Budget support: A reformed approach or old wine in new skins?
189	September 2008	Martina Metzger	Regional cooperation and integration in sub-Saharan Africa
188	March 2008	Ugo Panizza	Domestic and external public debt in developing countries
187	February 2008	Michael Geiger	Instruments of monetary policy in China and their effectiveness: 1994–2006
186	January 2008	Marwan Elkhoury	Credit rating agencies and their potential impact on developing countries
185	July 2007	Robert Howse	The concept of odious debt in public international law
184	May 2007	André Nassif	National innovation system and macroeconomic policies: Brazil and India in comparative perspective
183	April 2007	Irfan ul Haque	Rethinking industrial policy
182	October 2006	Robert Rowthorn	The renaissance of China and India: implications for the advanced economies
181	October 2005	Michael Sakbani	A re-examination of the architecture of the international economic system in a global setting: Issues and proposals
180	October 2005	Jörg Mayer and Pilar Fajarnes	Tripling Africa's Primary Exports: What? How? Where?
179	April 2005	S.M. Shafaeddin	Trade liberalization and economic reform in developing countries: structural change or de-industrialization?

No.	*Date*	*Author(s)*	*Title*
178	April 2005	Andrew Cornford	Basel II: The revised framework of June 2004
177	April 2005	Benu Schneider	Do global standards and codes prevent financial crises? Some proposals on modifying the standards-based approach
176	December 2004	Jörg Mayer	Not totally naked: textiles and clothing trade in a quota free environment
175	August 2004	S.M. Shafaeddin	Who is the master? Who is the servant? Market or Government?
174	August 2004	Jörg Mayer	Industrialization in developing countries: some evidence from a new economic geography perspective
173	June 2004	Irfan ul Haque	Globalization, neoliberalism and labour
172	June 2004	Andrew J. Cornford	The WTO negotiations on financial services: current issues and future directions
171	May 2004	Andrew J. Cornford	Variable geometry for the WTO: concepts and precedents
170	May 2004	Robert Rowthorn and Ken Coutts	De-industrialization and the balance of payments in advanced economies
169	April 2004	Shigehisa Kasahara	The flying geese paradigm: a critical study of its application to East Asian regional development
168	February 2004	Alberto Gabriele	Policy alternatives in reforming power utilities in developing countries: a critical survey
167	January 2004	Richard Kozul-Wright and Paul Rayment	Globalization reloaded: an UNCTAD Perspective
166	February 2003	Jörg Mayer	The fallacy of composition: a review of the literature
165	November 2002	Yuefen Li	China's accession to WTO: exaggerated fears?
164	November 2002	Lucas Assuncao and ZhongXiang Zhang	Domestic climate change policies and the WTO
163	November 2002	A.S. Bhalla and S. Qiu	China's WTO accession. Its impact on Chinese employment
162	July 2002	Peter Nolan and Jin Zhang	The challenge of globalization for large Chinese firms
161	June 2002	Zheng Zhihai and Zhao Yumin	China's terms of trade in manufactures, 1993–2000
160	June 2002	S.M. Shafaeddin	The impact of China's accession to WTO on exports of developing countries
159	May 2002	Jörg Mayer, Arunas Butkevicius and Ali Kadri	Dynamic products in world exports
158	April 2002	Yılmaz Akyüz and Korkut Boratav	The making of the Turkish financial crisis
157	September 2001	Heiner Flassbeck	The exchange rate: Economic policy tool or market price?

No.	*Date*	*Author(s)*	*Title*
156	August 2001	Andrew J. Cornford	The Basel Committee's proposals for revised capital standards: Mark 2 and the state of play
155	August 2001	Alberto Gabriele	Science and technology policies, industrial reform and technical progress in China: Can socialist property rights be compatible with technological catching up?
154	June 2001	Jörg Mayer	Technology diffusion, human capital and economic growth in developing countries
153	December 2000	Mehdi Shafaeddin	Free trade or fair trade? Fallacies surrounding the theories of trade liberalization and protection and contradictions in international trade rules
152	December 2000	Dilip K. Das	Asian crisis: distilling critical lessons
151	October 2000	Bernard Shull	Financial modernization legislation in the United States – Background and implications
150	August 2000	Jörg Mayer	Globalization, technology transfer and skill accumulation in low-income countries
149	July 2000	Mehdi Shafaeddin	What did Frederick List actually say? Some clarifications on the infant industry argument
148	April 2000	Yılmaz Akyüz	The debate on the international financial architecture: Reforming the reformers
146	February 2000	Manuel R. Agosin and Ricardo Mayer	Foreign investment in developing countries: Does it crowd in domestic investment?
145	January 2000	B. Andersen, Z. Kozul-Wright and R. Kozul-Wright	Copyrights, competition and development: The case of the music industry

Copies of *UNCTAD Discussion Papers* may be obtained from the Publications Assistant, Macroeconomic and Development Policies Branch (MDPB), Division on Globalization and Development Strategies (DGDS), United Nations Conference on Trade and Development (UNCTAD), Palais des Nations, CH-1211 Geneva 10, Switzerland (Fax no: +41 (0)22 917 0274/Tel. no: +41 (0)22 917 5896). Discussion Papers are accessible on the website at http://www.unctad.org.