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Abstract

The large imbalances in the current account positions of the US and the Asian economies are seen by most scholars as the main threat to an orderly development of the global economy. While the opinions on the most likely evolution of these imbalances and on their sustainability do differ across observers, ranging from catastrophic to rather optimistic views, almost all agree that some adjustment will have to take place in the next future, and that this adjustment will involve, among other things, a rebalancing of saving and demand across the globe. As an outcome of this process, China shall increasingly supplement the US in the role of engine of global economic growth.

Using a global macroeconometric model, we examine the impact on this adjustment process of a number of shocks originated in the Chinese economy, including an expansionary fiscal shock, a revaluation of the renminbi, and an expansion of internal demand following an acceleration in the process of rural-urban migration. The analysis focuses on two related points: how will these shocks affect the medium-run evolution of transpacific imbalances, and how will they impact on global economic growth. The simulations allow us to track the impact of these shocks on the different poles of the world economy, and to assess their relative contribution to the task of reducing global imbalances without interrupting global economic growth.

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CHINA AND GLOBAL EXTERNAL IMBALANCES: SOME FURTHER EVIDENCE

1. Introduction

At the end of the 20th century the US current account-to-GDP ratio registered a deficit of -3.2 GDP points, which was large with respect to the surplus position reached in 1991, but not unprecedented in historical terms (the post-WW2 historical low had been reached in 1987 at -3.4 GDP points). At the same time, China experienced a surplus position equal to 2 GDP points, which was about a half the historical high of 4.05 GDP points reached in 1997 in the aftermath of the Asian crisis. At that time global imbalances were no matter of concern.

Five years later, in 2004, the US and Chinese current account-to-GDP ratio were at -5.6 (and falling) and 4 (and rising), respectively. These figures, and especially the first one, raised eventually the attention of the scholars and policy makers at large. The latest figures available are at -6.5 (and stable; see IMF, 2007) and 9.5 (and rising; see OECD, 2007) respectively.¹ Under such circumstances, the global current account imbalances are naturally becoming one of the most debated issues in applied international macroeconomics, and the role of China in their development is addressed by a growing body of literature.

As it happens, the opinions expressed in the literature on both the causes of these imbalances, and the possible remedies, differ widely, ranging from gloomy forecasts of impending financial crises in the US, to rosy scenarios where the imbalances can last for decades before closing softly, with mutual benefits for all the parties involved. The scholars endorsing the pessimistic view are further divided on who should be held responsible of the current state of affairs, and therefore on who should bear the burden of the adjustment: is there too little saving in the US (in particular, as the argument usually runs, too little public saving), or too little consumption abroad (in particular, too little private consumption)? Shall the US government consume less, or the Chinese citizens consume more? Is the USD overvalued, or the CNY undervalued? Each of these competing views has conflicting implications for the orderly development of the global economy.

In any event, the opinions seem to converge presently on two points, namely that the global imbalances have a transpacific dimension, and therefore that the current situation will eventually call for a global rebalancing of saving and demand across the United States and the Pacific rim countries, in particular China and Japan. The opinions differ on whether this rebalancing is urgently needed and requires active policies, or, on the contrary, can be differed and will happen spontaneously (as endorsed by the optimistic view).

This paper contributes to the debate by measuring the actual relevance of some policy measures and exogenous shocks that are frequently mentioned as having a role to play in this adjustment process. This assessment is carried out using by simulating the impact on global current account imbalances and economic growth of an expansionary fiscal shock in China, of a revaluation of the CNY, and of an acceleration of the

¹ Remark that these percentages are calculated out of GDPs very different in size.

urbanisation process of Chinese rural population. The simulations are performed with a medium-size world macroeconomic model that considers China as a part of the global economy, that allows us to shed some light on the role that China can actually play, if any, in the global imbalances adjustment process.

The existing empirical literature, while providing evidence on similar scenarios, leaves some scope for further investigation. For instance, Inada (2000) simulates the impact on the Chinese economy of two kind of expansionary fiscal shocks using the ICSEAD model of the Chinese economy; however, he presents only unlinked simulations that do not measure the impact of these domestic shocks on the world economy. Déés (2001) links a macroeconomic model of China to the NiGEM world econometric model and simulates the impact of a 20% nominal *devaluation* of the CNY on US, EU and Japan competitiveness and export volumes; however, his study does not consider any kind of fiscal shock. By the way, the “sign” of the shock (devaluation, rather than a revaluation) is rather telling: it recalls us that six years ago (i.e., four years after the Asian crisis) the economists and the public at large were worried about a possible *overvaluation*, rather than undervaluation, of the CNY/USD exchange rate (Chou and Shi, 1998). As Yu (2007) points out, the undervaluation of the yuan was not mentioned before late 2002, i.e., seven years after the current account deficit had emerged as a structural phenomenon in China. BMI (2005) utilized the Oxford Economic Forecasting world model to study the impact of a 10% nominal *revaluation* of the CNY; however, this study focuses only on exchange rate policy and does not provide any indication about the effects of fiscal policy. The more complete study in this respect is that of Lee *et al.* (2006), who consider a wide range of scenarios, including a decline in East Asian investment rate, an appreciation of East Asian currencies, an US expansionary fiscal shock, and an Asian fiscal stimulus. However, their experiments, carried out using the G-CUBED dynamic intertemporal equilibrium model, are designed as to study coordinated policy measures among the East Asian countries. While this approach is certainly interesting, as East Asian policy coordination is widely seen as a (difficult) prerequisite for an effective management of the global imbalances, it prevents at the same time a definite assessment of the contribution of China, which in turn is seen as a leading actor in this adjustment process. Another interesting contribution comes from Zhang and Fung (2006), who focus on the consequences on the world economy of a real effective appreciation of the renminbi, using GTAP, a static computational general equilibrium model of the global economy. However, while in a static CGE model, with exogenous inflation, real and nominal appreciation do obviously coincide, this is unlikely to occur in the real world, where a nominal appreciation is likely to impact in the behaviour of domestic prices, thereby reducing the size of the real appreciation. This pattern is evident in all the studies mentioned above, in which the real effects of a nominal appreciation do generally vanish after the first year. Therefore, the analysis of Zhang and Fung (2006) on the welfare consequences of a real appreciation, while providing useful insights on the issue, does not solve the problem on how such a persistent competitiveness shock could be engineered.

Besides taking a different look at similar scenarios by focussing specifically on China (which may prove not completely devoid of interest), and removing some limitations of the previous studies, our paper investigates also some scenarios that to our knowledge were not yet investigated, despite being crucial in some explanations of the origins and remedies of the global imbalances. In particular, the structure of our model allows us to evaluate the impact of the migration from rural to urban China, which is

central to the “revived Bretton Woods” explanation of global imbalances (Dooley *et al.*, 2003; see Section 2.2 below).

The paper falls in five sections. After this introduction, Section 2 reviews briefly the main strands of the debate on global imbalances, focussing in particular on those studies that stress the role of China, in order to put in perspective the design of the simulations and to stress their bearings on the current debate; Section 3 presents the model that will be utilized in the simulation experiments; the results of the experiments are discussed in Section 4, and Section 5 concludes.

2. China and global imbalances

The purpose of this section is not to provide a complete survey of the literature concerning China and global imbalances. Such a task would require a separate study (see Yu, 2007). Rather, we aim at outlining the main streams of this rapidly growing literature, in order to put in perspective the simulation experiments carried out in this paper. A good start for such a task is the well known national accounting identity:

$$CA = X - M + NFI = S^N - I = \Delta NFA \quad (1)$$

where CA is the current account balance, X and M are exports and imports of goods and services, NFI is the balance on incomes (net foreign incomes from abroad), S^N is national saving, I is national investment, and NFA are the net foreign assets. The identity (1) states that a country is running a current account surplus whenever the sum of its trade balance to NFI is positive, in which case national saving exceeds national investment, and the residents of the country are accumulating net claims against non resident. Equation (1) lies at the heart of Mann (2002) analysis, according to which the current account can be looked at from three different perspectives:

- 1) a domestic one, based on the equilibrium between the flows of national saving and investment (the “saving-investment approach”);
- 2) an international one, based on the trade flows (the “balance of payments” or “elasticity approach”);
- 3) an international one, based on the flows and stock of financial assets (the “global portfolio” approach).

Although the separation between these three approaches is rather artificial in nature, nevertheless this simple framework helps in surveying the contributions to the debate on the causes and remedies of the global imbalances.

2.1 Global imbalances and the saving-investment approach

In a two country world it must always be true *ex post* that

$$S_1^N - I_1 = I_2 - S_2^N \quad (2)$$

i.e., if country 1 invests more than it saves ($S_1^N - I_1 < 0$), the excess expenditure must be financed by country 2 ($I_2 - S_2^N < 0$). Let country 1 be the US and country 2 China (or, more correctly, the East Asian economies): the saving-investment explanations of global imbalances have from time to time focussed on the left- or the right-hand side of equation 2.

Those who focus on the left-hand side attribute the current pattern of global imbalance to deficient US saving, i.e., to an excess of private and/or public consumption in the US.² In this respect the debate on global imbalances is related to that

² Remember that $S^N = Y^N - C - G$, where Y^N is GNP (i.e., GDP plus NFI), C is private consumption and G public consumption.

on the “twin deficits” in the US. In fact, while the decline in US private saving rate is a “secular” phenomenon that started at the beginning of the Eighties, global imbalances were perceived as a major issue only after 2002, as pointed out in the introduction. Therefore, some authors trace them back to the recent expansionary fiscal stance of the US administration (see Roubini and Setser, 2004, 2005). After some doubt at the beginning of the century (see Bagnai, 2006), there is now enough evidence of a significant long-run twin deficit relation in the US. However, although statistically significant, this relation is not strong in absolute terms: estimates obtained with different methodologies confirm that one GDP point of fiscal contraction determines an improvement of about 1/3 of GDP point in the current account balance.³ This means that even drawing to zero the US government deficit (which would be a remarkable shock for the world economy, equal to about 0.8 world GDP points) would reduce the current account imbalance by less than one US GDP point (other things being equal). This evidence, as well as a casual inspection of Figure 1, confirms that an effective rebalancing of US net saving cannot occur without implicating also the private sector, by interrupting the secular decline in its saving rate.⁴ Consumption from the US, however, is also an engine of global growth. Therefore, if we are to renounce to its contribution, something must replace it, the most obvious candidate being consumption from the surplus countries (China, Japan...). A central issue is therefore whether and when China can supplement the US as an engine of global growth.

This brings us to the “right-hand side” explanations of the global imbalances patterns. According to Bernanke (2005), the cause of the imbalances lies in the “global saving glut” determined (among other things) by increasing saving ratios and sharply declining investment ratios in most Asian economies in the aftermath of the Asian crisis (see Figure 2). While the “deficient US saving” view raises the issue of whether the rest of the world will prove willing to keep financing the US domestic sectors deficits, the “excessive world saving” view does obviously not raise the same problem, at least insofar as the Asian financial market will not develop enough to become a sure haven for this excess of financial resources, thus reducing the need for precautionary saving in Asian countries. Under this perspective, therefore, there are no problems of current account sustainability in the US, and the rebalancing of the global imbalances is a long term process. In any case, if one endorses the view that the US deficits is originated by the demand of US securities by the other countries, that actually “forces” the US to “live beyond its means”, any active rebalancing policy, if needed, should come from the East Asian countries. In particular, since China, after a moderate decline in the Nineties, is now experiencing again very high rates of investment (see Figure 2), it is argued that

³ This result is extremely robust across methodological approaches. For instance, Salvatore (2006) obtains a long-run budget deficit multiplier of 0.33 in a partial adjustment equation where current account balance depends on its first lag, on budget balance and on the rate of economic growth; Bagnai (2006) obtains a long-run budget deficit coefficient of 0.31 in a cointegrating relation between the current account, budget deficit and investment; Chinn and Ito (2005) obtain a somewhat smaller coefficient (0.21) in a panel regression that merges all the industrial countries and takes into account “financial development” proxies; Bartolini and Lahiri (2006) obtain a 0.30 coefficient in a panel regression that controls for population growth, using cyclically adjusted data on 18 OECD countries; simulations performed with the global model utilized in this study confirm that in the US a fiscal cut equal to 1 GDP point determine an improvement of the current account balance equal to 0.3 GDP points.

⁴ Remark that the pattern of the US current account from 1992 onwards is strictly correlated to that of US private, rather than public, saving. This implies that the increase in public saving from 1992 to 2001 has been matched by an equal increase in private investment. As a matter of fact, from 1992 to 2001 private investment has grown from 12 to 17 GDP points (OECD, 2007).

the rebalancing should take place mostly on the saving side. To this end, it is suggested that the Chinese government should expand public consumption expenditure, for instance by financing programmes of school and healthcare vouchers, as proposed by Chow (2007). Moreover, it can be argued that in some areas of China there is still need for important infrastructures, and therefore public investment should probably not decline in the foreseeable future. The outcomes of a more expansionary fiscal stance are analyzed in our first simulation experiment (see Section 4.2 below).

Some features of the “global saving glut” hypothesis do not square with the pattern of Chinese data. For instance, in China the investment ratio starts to decline from 1994 onwards (i.e., four years before what happens in most East Asian economies), and its decline is steady and relatively mild (see Figure 2). At the same time, current account surplus emerges as a chronic phenomenon in China starting in 1994 (as apparent in Figure 3), while the economies hit by the Asian crisis experienced a current account reversal four years later. Rather than to the Asian crisis, Woo (2006) traces back the origin of the Chinese structural surplus to the implementation of stricter controls on the state owned banks (SOBs), decided by Vice Premier Zhu Rongji in 2003, in order to stop the inflationary “liquidity tango” between SOBs and state owned enterprises (SOEs). As a consequence of this hardening of the “soft budget constraint”, an increasing flow of investment-motivated saving has started leaking abroad, thus generating a current account surplus, because of an inadequate intermediation, that was unable to channel these financial resources to the private sector enterprises. The solution of the imbalances requires from the side of China a coordinated policy package, among which a pre-eminent role is given to the reform of the financial system. Expansionary fiscal policy, in particular import-intensive public investment (Woo, 2007), has a role to play, to the extent that it helps in absorbing the excess saving. An increase in public consumption may also prove a sensible strategy, but only to the extent that it does not crowd out investment, as this would slow the transition process of the Chinese economy, by hindering the absorption of the huge excess supply of labour and the upgrading of the firms technological level, thereby favouring the persistence of the structural imbalances.

2.2 *Global imbalances and the elasticity approach*

Another strand of literature focuses on the trade flows dynamics and puts the blame of the current state of affairs on the export-led policies pursued by the Asian countries. It is argued that in the aftermath of the Asian crisis these countries have adopted an undervalued exchange rate in order to foster their growth. In other words, according to this view, the transpacific imbalances are explained mostly by real exchange rate misalignment. This argument leads to two opposite policy prescriptions.

The most popular one among the public at large is that in order to restore a sustainable pattern of global current account China should revalue (see Bergsten, 2007; Pisani-Ferry, 2007). According to this view, a revaluation of the renminbi would benefit both the US, by healing its current account deficit, and China, as it would imply a shift from external to domestic demand, thus favouring a more balanced pattern of growth. In the absence of a revaluation, China would keep following a growth pattern unbalanced towards the tradables sector, with adverse consequences on its long-run growth prospect, and in the US there would be protectionist pressures that would undermine the process of globalization. Given the wide relevance of this argument, our second

simulation addresses the impact of a revaluation of the renminbi on the global economy (see Section 4.3 below).

A different prescription is expressed by Dooley *et al.* (2003), according to which the current state of affairs does not require policy interventions of any kind. Dooley *et al.* (2003) agree that the global imbalances are actually determined by the export-led policies pursued by China: by adopting these policies, China is fostering the development of a productive traded goods sector that will absorb the surplus labour force coming from its rural areas. This export-led development process is beneficial to China, as it enables it to gradually improve the standard of living of its citizens; moreover, by accumulating a large stock of USD denominated official reserve, the People's Bank of China (PBC) insures itself against the risk of currency crises. At the same time, it is also beneficial to the US, that finds by the PBC cheap financing for its consumption-led growth pattern. This "Sino-American co-dependency" is seen by Dooley *et al.* (2003) as a particular case of a revived Bretton Woods system, where the US emerge as the core and reserve currency country, that provides financial intermediation services to Asian saving by running a current account deficit, and the Asian countries peg their currencies against the USD in order to foster export-led growth. This situation can therefore last with mutual benefits until the urbanization process is completed: at that time China will have naturally and gradually started to consume more, and will be able to suffer the losses determined by a revaluation of the CNY. The policy prescription here is "laissez faire".

An interesting insight of the revived Bretton Woods hypothesis is that the adjustment of global imbalances could occur gradually through a rebalancing of saving, that will follow as a result of the migration of Chinese consumers from rural to urban areas, with higher standards of living (and therefore with an increase in total Chinese absorption). Our third simulation experiment simulates the medium run impact of such a demographic transition (see Section 4.4 below).

2.3 *Global imbalances and the "global portfolio" approach*

We mention only briefly this third strand of research, as we will not directly address it in our simulation experiments. The "global portfolio" explanations are related to the "global saving glut" hypothesis of Bernanke (2005): in short, it is argued that global imbalances pose no threat to the orderly development of the world economy as long as the rate of return on the investment made in the United States will continue to outperform those of the investment made in the other regions. In other words, there is no danger of a shortage of overseas saving in the US as long as investing in the US is an attractive alternative for the "saving glut" countries (see Cooper, 2006; Caballero *et al.*, 2006).

3. **The model**

3.1 *The structure of the world macroeconomic model.*

The world macroeconomic model utilized in this simulation study was developed by Bagnai and Carlucci (2003) and Bagnai (2004). It consists of six country/area submodels, respectively for the euro area, the United States, Japan, the United Kingdom, China and the rest of the world, linked through trade and

competitiveness relations.⁵ The country submodels share a common theoretical framework, grounded on the standard AS/AD model and summarized in Table 1.⁶ In the short run output is determined from the demand side in a standard fashion (Eq. (1) to (4) in Table (1)), while in the long run it depends on the supply side, specified along the lines set forth in Nickell (1988), Whitley (1994) and Wallis (2000) in terms of the wage and prices equations and the factor demand functions. The labour demand function (Table 1, Eq. 7) follows from cost minimization under neoclassical technology, assuming Cobb-Douglas technology with constant return to scale and Harrod neutral technical progress, while the investment function (6) follows the approach of Knight and Wymer (1978), where the increase in the capital stock depends on the gap between the marginal productivity of capital and the real interest rate. The real wage long-run behaviour is determined by productivity and the unemployment rate (Eq. 11), while the price dynamics follows from a set of mark-up equations. A set of stock/flows identities tracks the evolution of the stocks of national securities (public debt) and foreign assets. These stocks, together with the stock of money, define the financial wealth, that feeds back in the consumption function.

In the linked simulations real world GDP is endogenous and affects, together with competitiveness, the demand for exports of each submodel, while imports depend on real domestic GDP and competitiveness. There are two separate competitiveness measures for exports and imports, that depend both on prices and bilateral exchange rates.⁷ Import competitiveness is defined as the ratio of domestic to import prices, while export competitiveness as the ratio of export to world prices. In both cases the prices are expressed in a common currency using the nominal exchange rates. These, in turn, are endogenised using the monetary approach of Frenkel (1976), thus establishing a further link between the financial and the real sector of the model.⁸

The model equation are estimated using the cointegration estimator of Gregory and Hansen (1996), that accounts for the presence of structural breaks of unknown date in the parameters.

The cointegration approach allows us to specify and maintain separately the long-run equations, that capture the theoretical relations underlying the model (e.g., the static homogeneity constraint in the wages and prices block and the other theoretical parameters of the supply side), and the short-run dynamic equation, cast in error-correction form, whose specification is more “data dependent”, on the basis of the assumption that economic theory does not always define strong priors on the shape of the adjustment processes, and that in the short-run real and nominal inertia will prevail (thus inducing a more “Keynesian” behaviour of the model).

Allowing for structural breaks of unknown date allows us to take into account longer spans of data than would otherwise be possible and results in equation with good statistical properties (as shown for instance in Bagnai and Carlucci, 2003), while preserving the long-run theoretical consistency of the model equations.

⁵ In the present model version the United Kingdom is taken as exogenous.

⁶ The simulation submodels are more developed, especially as far as the representation of the government sector is concerned, and consists, allowing for some country specific feature, of about 70 equations. The linked model utilized in the simulation experiments consists therefore of 289 equations.

⁷ In the stylized version proposed in Table 1 the competitiveness measures depend on a single bilateral exchange rate. In the econometric model they are specified as real effective exchange rates, using different sets of weights for the import and the export competitiveness measure. For a similar approach see Laxton *et al.* (1998).

⁸ In the present version of the model the nominal CNY/USD exchange rate is taken as exogenous.

3.2 *The specification of the Chinese block*

The specification of the Chinese submodel differs in several respects from the common framework outlined above, in order to take into account some important features of the Chinese economic structure and data. The most important departures from the basic framework are that in the Chinese submodel the supply side is disaggregated by main economic sector (hence the labour demand function and the investment function are disaggregated accordingly), and that total population is disaggregated into urban and rural population (therefore, disposable income and the consumption function are disaggregated accordingly). We discuss briefly these modelling choices.⁹

As far as the specification of the supply side is concerned, the departure from the structure adopted for the other countries was called for basically for addressing a rather severe data issue concerning the measurement of unemployment. In the other country submodels, the supply side behaviour is represented by the wages and prices equations, following the approach outlined in the previous subsection. For this approach to be implemented, one needs a reliable measure of the unemployment rate: this is well known not to be the case for the Chinese economy, where the official unemployment figures are widely believed to understate the phenomenon and show little or no variance over the last thirty years (Knight and Xue, 2006). This statistical constraint has led most authors to utilize output gap measures in the Chinese wage and prices equations. Scheibe and Vines (2005) provide a recent survey of this literature. They also show that as far as the modelling of wages in the Chinese economy is concerned, the most reliable output gap estimates are those coming from the residuals of an estimated production function. Building on their modelling experience, we decided to endogenise the output gap by modelling potential output through an explicit production function. Moreover, since the transition process is associated with deep changes in the relative weight of the economic sectors (the primary sector accounted for about 40% of GDP in 1978 and for only 11% in 2004; World Bank, 2006), we decided to disaggregate the supply side in the three main economic sectors. This led to the estimation of three production functions. The production inputs were disaggregated accordingly. Therefore, the Chinese submodel features three labour demand functions, for the primary, secondary and tertiary sector; following the approach of Inada (2000), the investment function is specified at the aggregated level, and the sectoral distribution of the aggregate flow is taken as exogenous. The output gap is measured at the whole economy level by aggregating the cointegrating residuals of the sectoral production functions. Since these are estimated in log-linear form, the fitted values are first converted in natural units, then added up, and the log of this sum is finally subtracted from the log of actual real GDP.

As for the disaggregation of total population, the process of urbanization in China has been widely recognized as an important phenomenon both for its dimensions and for its repercussions on economic growth (Zhang and Song, 2003; Zhao, 2005). As the labour market segregation determined by the Chinese household registration (*hukou*) system has become less severe, the share of urban over total population has kept increasing, going from about 26% at the beginning of the Nineties to an estimated 45% in 2006. This massive labour force reallocation, probably the largest migration in the history of mankind (Knight and Song, 2005), has taken place in the presence of a rising

⁹ A detailed account of the Chinese submodel specification and properties is given by Bagnai and Mongeau (2007).

urban-rural households income differential, going from 120% in 1990 (when the per capita annual income of a rural household was 686 yuan, and that of an urban household 1510 yuan) to 220% in 2004. As the rural-urban income gap is the most important “pull factor” of the urbanization process, this process is likely to continue in the medium run, even though in recent times rising food prices, as well as the industrialization of some rural areas, by adding to rural households income, may begin to dampen the pressure for migration. In any case, since rural-urban migration has a number of consequences at the macroeconomic level, mostly through the channel of aggregate demand, we decided to take it into account in a number of ways, building on some previous macroeconomic modelling studies, and in particular on Inada (2000). In particular, the rural and urban per capita incomes are modelled separately, thus endogenising the rural-urban income gap; this, in turn, affects the share of urban over total population, thus explaining the urbanization dynamics; the consequences on aggregate demand are dealt with by specifying two separate consumption functions for rural and urban households.

4. The simulations

4.1 *Design of the simulation experiments*

The potential contribution of China to global growth rebalancing was assessed through three simulation experiments:

- 1) *China fiscal expansion*: a permanent increase in Chinese real government consumption equal to 2% of baseline real GDP;
- 2) *China revaluation*: a 10% nominal revaluation of the renminbi against the USD;
- 3) *Chinese rural-urban migration*: an increase of 2 points in the rate of growth of urban population with respect to the baseline rate of growth, keeping unchanged the rate of growth of total population.

The simulations track the effects of these shocks on the model structure over a medium-run simulation horizon of five years. As stated in Section 2 above, the first experiment addresses the role of China in the saving-investment explanation of global imbalances, by measuring the impact on these imbalances of active government policies aimed at reducing the Chinese “saving glut”. The second experiment is cast in the framework of the elasticity approach and assesses whether and to what extent a CNY revaluation would contribute to a rebalancing of global trade flows. The third one is closely related to the revived Bretton Woods hypothesis, in that it aims at measuring the impact on global imbalances of the urbanization process in China.

4.2 *China fiscal expansion*

The main results of this experiment are summarized in Table 2. The most striking pattern emerging from the results is that a fiscal expansion in China, while exerting permanent effects on the Chinese current account balance, has almost no effects on the external imbalances of the other major poles of the world economy, and especially of the US. To put it in another way, and recalling the discussion in Section 2.1 above, there is little evidence that China can *at present* replace the US in the role of engine of global growth.

This result may appear at odds with the current emphasis on the impressive performance of the Chinese economy, as revealed by GDP growth rates and PPP measures. For instance, countless papers point out that between 1978 and 2004 the

average growth rate of real GDP has been equal to 9.7%, and that of real per capita GDP, measured at PPP, equal to 8.4% (World Bank, 2006). While this performance is undeniably outstanding,¹⁰ when it comes to the evaluation of the impact of China on the global economy levels (as opposed to growth rates) and market prices (as opposed to PPP measures) do also matter. In 1980, two year after this unequalled growth performance had begun, the share of China over world GDP, measured in current US dollars, was 0.95%. By way of comparison, northern Italy accounted at that time for 2.10% of world GDP. As is to be expected, when measured at PPP the contribution of China to world output was more than triple, at 2.87%. However, since we do not live in a barter economy, PPP measures, while appropriate for comparing the living standards of different populations, provide a misleading picture of potential aggregate demand spillovers from one country to another. Chinese nominal GDP in 1978 was equal to CNY 362 billions, i.e., to USD 214 billions, equivalent to EUR 145 billions at the then prevailing exchange rates: in other words, in 1980 the proceeds obtained by exporting the whole Chinese output had not bought the output of a relatively small European region as northern Italy. Of course, the low level of the initial conditions makes all the more remarkable the great achievements of the Chinese economy.¹¹ However, even though China since then has increased by more than 8 times its GDP per capita in PPP terms, and more than quadrupled its world GDP share, it currently accounts only for something between 5% and 7% of world GDP. While simple back-of-the-envelope calculations show that at the current rate of growth China GDP would surpass that of Japan in about ten years and that of the euro area in about fifteen years, it is still true that *at present* a fiscal stimulus that increases Chinese domestic demand (measured by real GDP) by about 1% in the medium run, as in our experiment, will show as an increase by about $1\% \times 5\% = 0.05\%$ in world aggregate demand.¹² These raw calculations explain the negligible effects on the other countries GDPs and current account-to-GDP ratios.

By the way, these orders of magnitude are compatible with the results of Lee *et al.* (2006), reported in Table 3. They study the impact of a fiscal stimulus equal to 2 GDP points coordinated among all the Asian countries except Japan, and find that such a coordinated policy effort results in a 0.04 improvement of the US current account deficit after five years. As China accounts for about a half of the GDP of the country group considered by Lee *et al.* (2006), our result of a 0.02 improvement in US current account deficit in the same time horizon is consistent with their results. Exactly the same reasoning applies to the findings concerning the euro area. This concordance of results is interesting in itself, as it is obtained within different models simulated with different initial conditions, time horizons and simulation techniques.¹³

¹⁰ We set aside here the intricate question of whether official data do reflect the actual GDP growth in China; see Rawski (2001) and the special issue of *China Economic Review*, vol. 12(4).

¹¹ In fact, according to standard growth theory, the low level of initial conditions contributes also to explaining these achievements, as the Solow (1956)-Swann (1956) model establishes a negative correlation between the size of the initial conditions and the growth rates of per capita GDP.

¹² As Table 2 shows, in the medium run world GDP increases actually by 0.04% above the baseline simulation path; remember however that in the current version of the model the “rest of the world” block, accounting for about 30% of world GDP, is taken as exogenous. This is likely to dampen somewhat the repercussions of the initial shock.

¹³ It should also be stressed that, no matter how counterintuitive this result may appear, the scientific literature has already recognized that trade-induced GDP spillovers are relatively small even

While negligible on the rest of the world, the effects of the fiscal shock are rather sizeable in China: the increase in real government consumption has persistent effects on real GDP, that converges quickly to about 1.2 per cent points above the baseline. This expansion of demand increases the output gap, thus fostering an increase in domestic prices that undermines price competitiveness of Chinese exports. At the same time, the GDP increase induces an increase in imports. At the end of the simulation horizon the result of a decrease of exports by 0.68 GDP points and an increase in imports by 1.09 GDP points is a worsening of the current account balance equal to 1.77 GDP points. In other words, roughly 90% of the fiscal shock translates into a current account correction (with a long-run effect which is thrice as large as that measured in the US, where according to the most recent empirical studies only about a third of a fiscal shock translates to the current account; see Section 2.1 above). There is therefore strong evidence of twin deficits in the Chinese economy. From a saving-investment perspective the adjustment is split unevenly, as the current account correction comes almost entirely from a reduction in national saving, while the adverse effects on the investment-to-GDP ratio are small and transitory.

Summing up, Chinese fiscal policy can help substantially the correction of Chinese external imbalance, without undermining the accumulation process and the medium term growth perspectives. However, owing to the relatively small size of the Chinese economy, a Chinese fiscal expansion cannot give a significant contribution to the resolution of the US external imbalance.

4.3 CNY revaluation

In the second simulation experiment we study the effect of a revaluation of the Chinese currency, by considering the impact of a permanent 10% revaluation of the CNY/USD exchange rate. Such a policy measure is insistently requested by policy makers and the public at large throughout the industrial world. By the way, the hypothesis that the growth performance of China is explained by export-led policies fostered by an undervalued exchange rate has received a considerable audience also at an academic level, as pointed out in Section 2.2 above. At a more general level, the debate on whether China should keep or abandon its dollar peg is still heated; see for instance the controversy between McKinnon (2007) and Roubini (2007). It is therefore interesting to assess whether and to what extent a revaluation of the Chinese currency would help in correcting the transpacific external imbalances.

The answer is: not much. The simulation results, reported in Table 4, show that the effects on China would be transitory, and those on the partner countries rather small, and in any case recessionary rather than expansionary. Interestingly enough, these results are qualitatively similar to those obtained by a host of other studies grounded on very different econometric approaches, such as BMI (2005), Lee *et al.* (2006), Zhang and Fung (2006), and Devereux and Genberg (2007) (see Table 5 for a comparison). While clashing with the conventional wisdom argument that a renminbi revaluation would help in correcting global imbalances, the agreement between these results suggests in our view that they reflect some important structural features of the Chinese economy, whose influence is so strong as to prevail over the difference of the econometric approaches. The most important among these structural features is perhaps the fact that China acts more and more as the central hub of an integrated Asian supply

among integrated economic systems as the G-7 countries; see Douven and Peeters (1998) for empirical evidence.

chain, by importing machinery and semifinished products (mostly from other Asian countries), and exporting finished products (mostly to western countries); see Eichengreen and Tong (2006), Gaulier *et al.* (2007).¹⁴ Therefore, processing trade accounts for a large share of total trade. This gives rise to two different phenomena, both of which dampen the “demand switching” effects of the nominal revaluation. First, since energy and intermediate inputs are priced in dollars, a nominal appreciation determines a reduction in the variable costs of Chinese enterprises, thus reducing the real effects of the nominal appreciation. Second, any attempt at dampening Chinese exports, no matter how brought about, to the extent that it proves successful would also dampen Chinese imports, with offsetting effects on the Chinese external accounts.¹⁵

Besides being transitory, the effects on the partner countries are small even in the short-run, for several reasons. First of all, Chinese export prices react very quickly to the devaluation, as a result of the willingness of the Chinese producers to absorb the loss of competitiveness in their profit margin, rather than lose market shares abroad. This is reflected by the fact that Chinese exports are generally priced in dollars, thereby reducing the pass-through of a renminbi appreciation to the prices of Chinese goods in foreign markets.¹⁶ Moreover, the share of Chinese goods in total imports is presently around 12% in the US and 5% in the euro area (see Figure 4), which implies that a 10% CNY revaluation will show up, other things being equal, as a real effective depreciation of the USD by only 1.2% and of the EUR by 0.5%, with negligible effects on the current account balance. To put it in another way, in 2006 the US imports from China topped at USD 287 billions. Despite being a huge sum, this accounts for only 2.06% of US GDP. This implies that even assuming a relative price elasticity of imports around unity, and setting aside all the offsetting forces outlined above, a 10% CNY revaluation would reduce the US imports from China by only 0.2 GDP points. Since the USD deficit accounts for about 6 GDP points, it is dubious that a revaluation of the CNY would determine a significant correction of the US external imbalance even under these extremely favourable hypotheses.¹⁷ Once again, China cannot be seen as the main cause, nor as the solution, of US external imbalance, simply because, despite growing at stunningly high rates, its size is still relatively small with respect to that of the US.

The simulation shows also that the medium-run consequences of a CNY revaluation for the other poles of the world economy are rather adverse: with the only exception of Japan, they all experience a (small) GDP loss. As a result, world real GDP decreases persistently by about 0.1%. This effect occurs through two different channels: first, a revaluation of the renminbi increases the pressure of China on the energy

¹⁴ The main destinations of Chinese exports are the US (21% in 2006) and Hong-Kong (16%), from where most goods are redirected towards the western economies, while the main origins of the imports are Japan (15%) and South Korea (11%). Remember also that China features a bilateral current account deficit towards Japan of around 1 GDP point, and that the share of processing trade imports over total imports has grown from 7% in 1985 to 41% in 2005 (NBS, 2006).

¹⁵ As a matter of fact, most macroeconomic models include exports as a separate explanatory variable in the import function. The estimated impact elasticities are generally found to be very high. For instance, Tsang and Ma (1997) found a 97% elasticity, Qin *et al.* (2006) a 83% elasticity, while our own estimates the impact elasticity is somewhat smaller at 67%.

¹⁶ However, the recent rises in wages, energy prices and interest rates may leave less room in the next future for such a behaviour, thereby strengthening the price competitiveness effects of a nominal revaluation.

¹⁷ In fact, the relative price effects are likely to be much smaller. For instance, in our model the relative prices have an estimated impact elasticity on US imports equal to 0.18, with a long-run elasticity of 0.41 and a mean lag of about two years.

markets, thus inducing significant inflationary effects at the global level. Second, there is also a direct effect, in that the (temporary) increase in the prices of goods imported from China, induces a decrease in the real disposable income of households in the rest of the world (US, euro area, etc.).¹⁸

It is interesting to trace the effects of the revaluation on the Chinese economy. The impact on trade flows is quite large: real exports-to-GDP ratio falls by 2 points, and the same applies to imports, that increase by 1% in volume but fall as a ratio to GDP. The current account thus worsens by 0.60 GDP points. As the impact of this negative shock on aggregate demand is larger than that on aggregate supply, the output gap falls, thereby inducing a downward adjustment in the domestic prices which offsets the real effects of nominal appreciation. At the end of the simulation horizon domestic prices have absorbed completely the revaluation shock. This relative price effect, together with the “processing trade” effect (i.e., the dependency of imports on exports demand), and the fall in domestic demand, counterbalances the rise in imports volume, that reverts to the baseline by the end of the simulation horizon. As a consequence, the currency appreciation has only transitory effects on the current account balance, which at the end of the simulation period improves slightly by 0.1 GDP points. In fact, as time passes private consumption adapts to the fall in disposable income: this dampens the reduction in national saving induced by the revaluation (the reduction in national savings goes from -0.7 to -0.35 GDP points); at the same time, the reduction in private investment is more persistent and offsets, starting from the fourth year, the reduction in national savings, thus improving the current account balance.

Summing up, in the medium run a CNY revaluation is likely to have perverse effects on the size of Chinese external imbalance, by depressing national investment more than national saving and undermining the medium term growth prospects of the Chinese economy. Such a policy measure therefore would harm the Chinese economy without any tangible benefit (and even with adverse consequences) for the other poles of the global economy.

4.4 Chinese rural-urban migration

As recalled in Section 2.2 above, according to the Bretton Woods II hypothesis, the need to absorb the surplus labour force coming from the rural areas is a major driving force of the Chinese external imbalances. This implies that the imbalances will unwind gradually as the rural-urban migration is completed. Rural-urban migration has occurred steadily over the last thirty years, leading to an increase of the urban-to-total population ratio. However, this process has witnessed a number of different stages, being from time to time encouraged or restricted, as explained for instance by Liu *et al.* (2003) and Zhao (2005), and as is evident in Figure 5. It is therefore interesting to verify whether fostering rural-urban migration can actually contribute to a rebalancing of Chinese external accounts. The last scenario simulates the impact of a speed up of the rural-urban migration process, measured by a two per cent points increase in the rate of growth of urban population with respect to the baseline rate of growth, taking the rate of

¹⁸ Low-price goods from China have saved to the US consumers some USD 600 billions in the last decade, according to Morgan Stanley estimates quoted by Zhang and Fung (2006); Yu (2007) considers also the lowering of US interest rates induced by Chinese saving supply and provides a somewhat higher estimate of USD 80 billions per year; moreover, US producers of relatively expensive high-tech goods may have profited of this income effect, as pointed out by Gabriel (2007); see also the Economist (2007).

growth of total population as unchanged. The design of the simulation experiment is set out in Table 6. Although these effects are crucial to the Bretton Woods II hypothesis, we do not know of any other attempt to quantify their impact.

A short reflection suggests that this impact needs not to be obvious. In fact, in China the average propensity to consume (APC) out of disposable income is higher for rural than for urban population. Using NBS (2005) data from 1978 to 2005, the sample average of the rural APC approaches 100%, while the urban APC is around 85% on average, and around 70% by the end of the sample. One may therefore wonder how shifting population from the high to the low propensity group may increase the aggregate propensity to consume. It is interesting to take this issue more in detail, before presenting the simulation results. Let β^R and β^U be the rural and urban APC, y^R and y^U be the rural and urban households income per capita, ρ be the share of rural over total population, and Y^F the income accruing to the firm sector. By normalizing the total population at one, the aggregate average propensity to consume can be expressed as:

$$\frac{C}{Y} = \frac{\beta^R y^R \rho + \beta^U y^U (1-\rho)}{y^R \rho + y^U (1-\rho) + Y^F}$$

and its derivative with respect to the rural-to-total population ratio, ρ , is:

$$\frac{\partial}{\partial \rho} \frac{C(\rho)}{Y(\rho)} = \frac{\beta^R y^R - \beta^U y^U - (y^R - y^U) \frac{C}{Y}}{Y} \quad (3)$$

In order to understand the meaning of this formula, consider the limiting case in which the rural-urban gap closes completely: $y^R = y^U = y$. In this case the numerator of (3) becomes $(\beta^R - \beta^U)y > 0$, and under the hypothesis of a larger propensity to consume in the rural population ($\beta^R > \beta^U$), the effect of a reduction of ρ on the aggregate consumption share would be negative. However, since in China $\beta^R \approx 1$, $\beta^U \approx 0.7$, $y^R \approx 3$ (in thousands yuan per capita), $y^U \approx 10$, $C/Y \approx 0.4$, the sign of this derivative is negative, which implies that reducing the share of rural over total population, ρ , does actually *increase* the aggregate average propensity to consume. The reason is that although the rural households have a larger propensity to consume, their incomes are very low in comparison to those of the urban households: therefore, increasing the number of the latter has a positive effect on the aggregate consumption share. Moreover, we should also expect the import content of consumption to vary between the two groups, being larger in urban households' consumption. This corroborates the intuition that a shift from rural to urban population would have a negative impact on trade balance.

The simulation results show that a speed up of the rural-urban migration process has the expected effects on the saving ratio and the external imbalance. As the urban per capita income is about three times as large than the rural one at the beginning of the simulation horizon, this shift has beneficial, though progressive, effects on real GDP, that on the medium run increases persistently by about 0.3% with respect to the baseline. The increase in consumption induces a fall in national saving-to-GDP ratio. As the investment-to-GDP ratio is almost unchanged, this reduction in saving is mirrored by a fall in the current account balance, equal to about 0.4 GDP points at the end of the simulation horizon. From a trade flows perspective, this adjustment comes mostly from

a rise in imports (0.27 GDP points), and a more limited fall in exports (−0.12 GDP points), the latter brought about by a slight deterioration of price competitiveness, induced by a moderate rise in domestic prices. Summing up, an increase of 4.5 points in the urbanization rate brings about a correction of −0.41 GDP points in the current account-to-GDP ratio. Since the urbanization rate is forecast to increase in a range between 12 and 19 points in the next two decades (Liu *et al.*, 2003), the expected reduction in the current account balance would be in a range between one and 1.7 GDP points, other things being equal.

This effect is likely to be reinforced by another demographic trend, namely the increase in the dependency rate. According to the life-cycle hypothesis of saving, an increase in the dependency rate determines a decrease in private saving, with adverse effects on the current account balance. Kim and Lee (2007) verify this hypothesis using a panel VAR approach on a sample of ten East-Asian countries. Their impulse response functions show that over two decades an increase of the elderly dependency rate by about 0.25 percentage point is associated with a decrease of private saving by 0.8 percentage point. Since the effects in the investment ratio are found to be negligible, this reduction is mirrored by a worsening of the current account balance. Since in the next two decades the elderly dependency rate is expected to increase substantially, this evidence shows that, other things being equal, the combined effect of the urbanization process and demographic transition would contribute substantially to the reduction of the Chinese external surplus.

5. Conclusions

This paper aims at assessing the role of China in the genesis of transpacific external imbalances, and at measuring the potential contribution of China to their unwinding. To this end we compare the evidence gathered in the macroeconomic literature, and provide some fresh results based on the simulations of a medium-size multicountry model of the global economy. The role of China is evaluated by measuring the medium-run impact on the global imbalances adjustment process and on world economic growth of a number of exogenous shocks originated in the Chinese economy. These shocks include policy measures that are often advocated as useful, if not decisive, for the solution of the global imbalances: an expansionary fiscal shock in China, and a CNY revaluation. Moreover, we also estimate the macroeconomic impact of rural-urban migration, that plays an important role in the “revived Bretton Woods” explanation of the current pattern of global imbalance.

The evidence provided is unambiguous: the results surveyed, as well as the fresh results provided in this paper, despite being obtained from models very different in size, theoretical approach, estimation sample, and simulation horizons and techniques, do all agree on the fact that the expenditure switching induced by a one-shot nominal renminbi appreciation would be transitory; on the contrary, a fiscal expansionary shock would exert lasting and sizeable effects on the Chinese current account balance. The simulations point out also that, over the medium run, a significant correction of the external imbalances will come from the urbanization of rural population. However, the impact of these shocks, while being rather sizeable on the Chinese economy, would be negligible on the other poles of the world economy. The main conclusion is therefore that the rising claims that China is responsible for the global external imbalances, and in particular that its policy stance will be decisive in the adjustment of the US external deficit, are unsupported by the empirical evidence.

Up to a certain extent, these conclusions can be arrived at by a simple inspection of the data and some back-of-the-envelope calculations.

As far as the causes of the imbalances are concerned, consider that the recent urge of the US deficit predates by several years the emergence of the Chinese surplus, and that the former is more than thrice as large as the latter (Figure 3). It is difficult to believe that a relatively small surplus be the cause of a larger and *pre-existing* deficit. The pattern and timing of the data suggest instead that the structural determinants of the Chinese surplus and US deficit are substantially unrelated. This is especially evident if we look at these imbalances from a saving-investment perspective. As Figure 1 shows, from the beginning of the Nineties the worsening of the US external accounts is strictly correlated with the fall in US private saving ratio, while, as shown in Figure 3 and 6, the improvement of Chinese current account begins later, in 1995. Therefore, as far as the US deficit is concerned, the data are consistent with the hypothesis of excess private consumption in the US, rather than excess saving in China. “Money glut” in the US, determined by the application of inflation targeting policies (as suggested by Leijonhufvud, 2007), appears more plausible as an explanation than “saving glut” in Asia. Moreover, reasoning still in terms of global saving-investment rebalancing, we must recognize that since China accounts for about 5% of world GDP, saving or investment correction in an order of 1% of Chinese GDP will show up as 0.05% corrections in the world aggregate demand. Such an order of magnitude is inadequate to promote an appreciable rebalancing of saving and investment across the world. Put it in another way, a country that accounts for about 5% of world GDP cannot be held responsible for, nor asked to soak up, a deficit that accounts for 2.5% of world GDP.

If we reason instead in terms of the trade flows elasticity approach, it is interesting to remark that the sizeable improvement of the Chinese current account balance, equal to 11 GDP points from 1993 to 2006, has been accompanied by a 35% *appreciation*, rather than a depreciation, of the Chinese currency in real terms (see Figure 6). Therefore, price competitiveness cannot be the only explanation of the success of Chinese exports.¹⁹ Rather, the evolution of the Chinese external accounts reminds of the so called “Kaldor paradox”. Kaldor (1978) remarked that the export shares of Japan and Germany in the aftermath of WWII had increased in correspondence with a real appreciation of their respective currencies. This remark paved the way to the study of the impact of non-price competitiveness on trade and growth. After three decades of theoretical and empirical analyses, the most recent and complete studies point out that non-price competitiveness is a crucial determinant of trade flows (Fagerberg *et al.*, 2007). Some data are interesting in this respect: from 1996 to 2003 the R&D expenditure-to-GDP ratio in China has doubled, the number of researchers in R&D per million people has increased by 50%, and the share of high-tech over total exports has more than doubled (World Bank, 2006). While we do not claim that these data explain the behaviour of Chinese exports in full, their patterns, unlike that of the real exchange rate, are at least compatible with the recent evolution of Chinese external accounts. Interestingly enough, even studies aimed at measuring the misalignment of the renminbi real exchange rate, like Coudert and Couharde (2005), while admitting the existence of such a misalignment, conclude that the US deficit depends on USD, rather than CNY, misalignment, and that the influence of CNY misalignment on USD misalignment is negligible (i.e., correcting the misalignment of the renminbi would leave the US

¹⁹ By the way, China has kept its dollar peg even in the relatively long period in which the USD was appreciating (from 1998 to 2001), thereby accepting to lose competitiveness along with the US.

external deficit almost unaffected). Once again, this is easily understood: as stated before, since the import and export shares of China in the two largest pole of the world economy (the US and the euro area) are still relatively small (in an order of magnitude around 10%), any correction of the CNY exchange rate of a credible size (say, in a range within 20%) will produce a very small real effective depreciation in the US and euro area economy, with a limited positive impact on their current accounts.

Summing up, if Chinese savings and the renminbi exchange rate are not the causes of the current troubles, they cannot be the cure, and this is exactly what the results of the simulations say.

Nevertheless, the requests for a revaluation of the CNY are becoming more and more insistent. The reason is probably that the debate on nominal exchange rate has some features that make it extremely suitable to a political exploitation: first, it has the merit of an apparent, and perhaps illusory, simplicity, in that the impact effects of a revaluation are easily understood by the public at large. Second, it puts the blame of the current state of affairs on “the others”, with China replacing Japan in the unpleasant role of the wicked (held by the latter during the Eighties). These are probably the reasons why, with the 2008 presidential elections approaching, the usual “read my lips, no new taxes” has been joined by “read my lips, China must revalue”. This simplistic message is likely to find a wide audience in an American middle class put under strain by the structural adjustments induced by the globalization, as documented in Woo (2007).

However, yielding to the temptation of using yuan appreciation to heal US worker anxiety (using Woo’s words) could prove a mistake. In fact, our simulations show that instead of triggering the shift of China to a pattern of growth supported by internal, rather than external, demand, as hypothesized by Bergsten (2007) and Pisani-Ferry (2007) among others, the appreciation of the renminbi would improve, rather than worsen, the current account balance over the medium run, because the fall in national investment would more than offset the fall in national saving.²⁰ Moreover, this shock would undermine growth not only in China, but also in the United States and the euro area.

Irrespective of its adverse consequences, such a policy measure is also difficult to implement for a number of reasons. Consider for instance that a once-for-all revaluation would imply a huge and sudden capital loss on the large stock of USD denominated official reserves of the People Bank of China (PBOC). The most likely outcome would be a monetary contraction in China (with a further fall in Chinese imports), and a period of financial instability in the whole area. Furthermore, by reasoning in terms of a “war” between China and western countries, we neglect Japan, who accounts for a fair 12% of the world economy (twice as much as China). As recalled above, China has a deficit with Japan equal to about 1% of Chinese GDP. A short reflection, as well as the knowledge of some basic historical notions, makes clear that China would not like to lose further competitiveness with respect to its neighbour. This is all the more true, as Japan (not China) has depreciated by 30% in the last decade, and is in a chronic surplus position with respect to the rest of the world (including China). To be effective, the revaluation should be designed as a coordinated and lasting effort between Asian central banks. However, the US would hardly consider as beneficial to their economic interests such a beginning of Asian economic integration.

²⁰ The same conclusion is reached also by Zhang and Fung (2006), using a static CGE model, and by Devereux and Genberg (2007), using a calibrated intertemporal equilibrium model derived from the “redux” model of Obstfeld and Rogoff (1995).

Moreover, the emphasis on the transpacific dimension of the imbalances leads not only to an overstatement of the role of China, but also to an understatement of the role of Europe. This is generally overlooked on the basis of the fact that the external position of Europe as a whole has been relatively balanced over the last two decades (see Figure 3). However, this does not necessarily imply that Europe is not responsible for the current state of affair, nor that it cannot help to the solution. As Figure 7 shows, the worsening of the US external balance from the beginning of the Eighties is determined by a slowdown in US exports, that coincides with a slowdown in the real growth of Europe.²¹ This suggests that the deflationary policies pursued by Europe in its quest of monetary stability and monetary union may explain at least partially the behaviour of US external accounts: “money drought” in Europe is at least as likely to be part of the picture as “saving glut” in China. In any case, faster growth in Europe could undoubtedly help US exports. Simulations performed with the US block of our model show that an additional point of real GDP growth in the euro area from 1980 onwards results in a 1 GDP point of improvement in US current account balance at the end of the sample.²²

As recalled above, the “saving glut” hypothesis put forward by Bernanke (2007) stresses that the external indebtedness of the US is a physiological consequence of the current global monetary system. The leadership of the United States causes a growing demand for USD denominated assets by the rest of the world, namely, a growing indebtedness of the United States. If we look at them in this perspective, the present imbalances find their solution in two medium run processes: the development of Asian financial markets, and the spreading of the euro as an instrument on international liquidity. The second process, however, must reckon with a self-evident truth, namely that the euro, exactly in the same way as the dollar, cannot circulate in the international monetary system without being injected into it! And the real counterpart of a net supply of currency to the rest of the world is a net demand of goods from the rest of the world, namely a trade deficit. This, in turn, cannot show up in an economy that keeps growing under its potential.

In other words, in order to contribute to the solution of global imbalances, Europe, rather than adapt passively to the political debate internal to the US, joining the US requests for a CNY revaluation, and engaging itself once more in a battle whose meaning and outcomes are uncertain, should simply find the courage to grow. Since Europe is the second major pole of the world economy, a faster growth of the European economy would certainly favour the solution of the global external imbalances.

We conclude by observing that the situation could evolve fast, as the growth rate of China is forecast to remain in the next years close to the extremely high level experienced in the last years. For instance, crude calculation based on the latest IMF forecasts (IMF, 2007) show that in the next year the share of China in world GDP could increase by 1 world GDP point, going from 5% to 6%. If this growth performance,

²¹ Consider that at the beginning of the Eighties the countries included in the euro area accounted for about 20% of world GDP and for 20% of US exports (while China accounted for 1% of world GDP and 2% of US exports). The average growth differential between the European Monetary Union and the United States has been 0.70 from 1961 to 1978, and -0.83 from 1979 (i.e., from the inception of the European Monetary System) onwards. The *t*-statistic of this difference is equal to 2.6, which is significant at the 2.5% level.

²² In other words, if EU growth had kept pace with US growth in the last two decades, instead of falling behind by 1.5 points on average, the US current account-to-GDP ratio in 2006 would have been around -4.5 GDP points, instead of -6. The detailed results are available upon request.

featuring growth rates from three to four times larger than those of its main partner countries, could be sustained for a decade, China would gain 1 point of world GDP about every two years, doubling its share in world GDP by 2016. At that time its impact on the rest of the world will not be negligible any longer. In this respects we recall that the simulations of Lee *et al.* (2006) foresee no tangible effects of Asian fiscal expansion and revaluation over a horizon of 10 years. We think however that this scenarios deserve further investigation, that we leave for future research.

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7. Tables

Table 1 – The country/area submodels structure

Demand side			
(1) $c = f_1(Y^D/P, A/P)$	(2) $y = c + g + \dot{k} + x - m$		
(3) $m = f_2[y, P/(eP^M)]$	(4) $x = f_3[y^*, P^X/(eP^W)]$		
(5) $A = M + D + NFA$			
Supply side			
(6) $\dot{k} = f_4 \left[\left(\alpha \frac{e^{\lambda_L t} N}{k} \right)^{1-\alpha} - (i - \dot{P}) \right]$			
(7) $\ln N = \ln y + \alpha \left[\ln \left(\frac{1-\alpha}{\alpha} \right) - \ln \left(\frac{W}{R} \right) \right] - (1-\alpha)\lambda_L t$			
(8) $k = (1-\delta)k_1 + \dot{k}$			
Wages and prices			
(9) $U = 1 - N/L$	(10) $ULC = W/(y/N)$		
(11) $\ln(W/P) - \ln(y/N) = f_5(U)$	(12) $R = f_6(P, i)$		
(13) $\ln P = \mu \ln(eP^M) + (1-\mu)\ln ULC$	(14) $\ln P^X = \xi \ln(eP^W) + (1-\xi)\ln P$		
Monetary sector			
(15) $M/P = f_7(y, i)$	(16) $i = f_8(\dot{y}, \dot{P})$		
Foreign sector			
(17) $e = f_9(M, M^*, y, y^*, i, i^*)$	(18) $CA = x \times P^X - m \times e \times P^M + NFI$		
(19) $NFA = NFA_1 + CA$			
Government sector			
(20) $T = f_{10}(P \times y)$	(21) $Y^D = N \times W - T$		
(22) $F = P \times g + i \times D - T$	(23) $D = D_1 + F$		
Endogenous variables			
A	financial wealth	NFA	net foreign assets
c	real consumption	P	domestic prices
CA	current account balance	P^X	export prices
D	public debt	T	tax receipts
e	nominal exchange rate	R	user cost of capital
F	public deficit	U	unemployment
g	real government consumption	ULC	unit labour costs
i	interest rate	W	nominal unit wage
k	real fixed capital stock	x	real exports
m	real imports	y	real output
M	nominal money stock	Y^D	nominal disposable income
N	employment		
Exogenous variables			
i^*	foreign interest rate	P^M	import prices (in foreign currency)
L	labour force	P^W	world prices (in foreign currency)
M^*	foreign money stock	y^*	world real demand
NFI	net foreign income from abroad		
Key parameters			
α	capital elasticity of output	μ	import price el. of domestic prices
δ	depreciation rate	ξ	world price el. of export prices
λ_L	labour augmenting tech. progress		

Table 2 – Chinese fiscal expansion

China	1	2	3	4	5
real GDP	0.87	1.09	1.19	1.24	1.24
private consumption deflator	0.00	0.09	0.28	0.52	0.75
GDP deflator	0.01	0.03	0.16	0.37	0.68
real exchange rate	0.00	0.00	0.03	0.10	0.19
national saving-to-GDP ratio	-1.52	-1.57	-1.67	-1.75	-1.81
investment-to-GDP ratio	-0.18	-0.12	-0.08	-0.06	-0.04
exports-to-GDP ratio	-	-	-	-	-
	0.25	0.35	0.45	0.57	0.68
imports-to-GDP ratio	1.08	1.10	1.14	1.12	1.09
current account-to-GDP ratio	-1.33	-1.45	-1.59	-1.69	-1.77
United States	1	2	3	4	5
real GDP	0.01	0.02	0.02	0.02	0.02
GDP deflator	0.00	0.00	0.00	0.01	0.02
current account-to-GDP ratio	0.00	0.01	0.01	0.01	0.02
Euro area	1	2	3	4	5
real GDP	0.01	0.02	0.02	0.02	0.02
GDP deflator	0.00	0.01	0.02	0.03	0.04
current account-to-GDP ratio	0.01	0.01	0.02	0.03	0.03
Japan	1	2	3	4	5
real GDP	0.01	0.01	0.01	0.01	0.01
GDP deflator	0.00	0.00	0.00	0.01	0.01
current account-to-GDP ratio	0.00	0.00	0.01	0.01	0.01
World	1	2	3	4	5
real GDP	0.02	0.03	0.03	0.04	0.04

Note: Permanent increase in Chinese real government consumption expenditure by 2% of China baseline real GDP. Per cent deviations from baseline (per cent points deviations for the variable expressed as ratio to GDP).

Table 3 – Chinese fiscal expansion: a comparison of results

	Year 1		Year 5	
	(a)	(b)	(a)	(b)
real GDP				
China	0.87	1.93	1.24	-0.12
US	0.01	-0.02	0.02	-0.07
Euro area	0.01	-0.06	0.02	-0.10
Japan	0.01	-0.03	0.01	-0.18
current account/GDP	(a)	(b)	(a)	(b)
China	-1.33	-0.47	-1.77	-0.41
US	0.00	0.05	0.02	0.04
Euro area	0.01	0.06	0.03	0.06
Japan	0.00	0.11	0.01	0.10

Note: Permanent increase in Chinese real government consumption expenditure by 2% of China baseline real GDP. Per cent deviations from baseline (per cent point deviations for the current account/GDP ratio). Column (a) reports our results, column (b) those of Lee *et al.* (2006), that refer to a coordinated fiscal stimulus in the whole East Asia region (excluding Japan).

Table 4 – Chinese currency appreciation

China	1	2	3	4	5
real GDP	-1.15	-1.68	-1.98	-1.96	-1.69
private consumption deflator	-1.54	-4.04	-6.60	-8.68	-10.08
GDP deflator	-1.70	-3.08	-4.98	-7.04	-8.75
real exchange rate	1.59	3.12	3.15	2.50	1.66
national saving-to-GDP ratio	-0.74	-0.45	-0.39	-0.39	-0.36
investment-to-GDP ratio	-0.14	-0.23	-0.36	-0.46	-0.46
exports-to-GDP ratio	-2.01	-1.61	-1.16	-0.71	-0.37
imports-to-GDP ratio	-	-	-	-	-
	1.41	1.39	1.13	0.78	0.48
current account-to-GDP ratio	-0.60	-0.22	-0.03	0.07	0.11
United States	1	2	3	4	5
real GDP	-0.01	-0.03	-0.05	-0.06	-0.06
GDP deflator	0.01	0.04	0.08	0.11	0.13
real exchange rate	-0.13	-0.27	-0.29	-0.23	-0.12
current account-to-GDP ratio	-0.01	0.00	0.01	0.02	0.02
Euro area	1	2	3	4	5
real GDP	0.00	0.00	-0.02	-0.04	-0.04
GDP deflator	0.01	0.03	0.04	0.03	0.00
real exchange rate	-0.15	-0.37	-0.36	-0.14	-0.03
current account-to-GDP ratio	0.00	0.01	0.01	0.00	-0.02
Japan	1	2	3	4	5
real GDP	0.01	0.04	0.07	0.08	0.08
GDP deflator	-0.02	-0.03	-0.01	0.03	0.08
real exchange rate	-0.06	-0.12	-0.12	-0.07	0.02
current account-to-GDP ratio	-0.01	-0.02	-0.01	0.01	0.03
World	1	2	3	4	5
real GDP	-0.05	-0.07	-0.10	-0.11	-0.10

Note: A permanent decrease by 10% in the CNY/USD exchange rate. Per cent deviations from baseline (per cent points deviations for the variable expressed as ratio to GDP).

Table 5 – Chinese currency appreciation: a comparison of results

	Year 1			Year 3		Year 5	
	(a)	(b)	(c)	(a)	(c)	(a)	(b)
real GDP							
China	-1.15	-4.13	-0.89	-1.98	-0.53	-1.69	-0.19
US	-0.01	-0.01	0.01	-0.05	0.00	-0.06	0.01
Euro area	0.00	-0.01	0.02	-0.02	-0.02	-0.04	0.01
Japan	0.00	-0.02	0.04	0.07	0.02	0.08	0.03
current account/GDP							
China	-0.60	0.02	-0.45	-0.03	-0.10	0.11	-0.01
US	-0.01	0.00	0.01	0.01	0.07	0.02	0.00
Euro area	0.00	0.00	0.02	0.01	0.03	-0.02	0.00
Japan	-0.01	-0.01	0.04	-0.01	0.09	0.03	0.00

Note: A 10% permanent decrease in the CNY/USD exchange rate. Per cent deviations from baseline (per cent point deviations for the current account/GDP ratio). Column (a) reports our results, column (b) those of Lee *et al.* (2006), that refer to a coordinated appreciation in China and the other five most crisis-hit Asian economies (results not available for year 3), column (c) those of BMI (2005), scaled down to the size of the shock considered in our simulation (results not available for year 5).

Table 6 – Design of the rural-urban migration scenario

	1	2	3	4	5	
urban population growth rate						<i>average</i>
baseline	4.5%	4.3%	4.1%	4.1%	4.1%	4.2%
scenario	6.5%	6.3%	6.1%	6.1%	6.1%	6.2%
urbanization rate						
baseline	39.1%	40.5%	41.9%	43.4%	44.9%	
scenario	39.8%	42.1%	44.4%	46.8%	49.4%	
deviation of urban population from baseline						<i>cumulate</i>
absolute	9.6	20.3	32.0	44.8	58.9	165.6
percentage	2%	4%	6%	8%	10%	

Note: The table compares the baseline and counterfactual values of some selected variables. In the counterfactual scenario the rate of growth of urban population is 2 per cent points larger than in the baseline. The average growth rate of urban population is therefore 6.2% in the scenario, against 4.2% in the baseline.

Table 7 – Chinese rural-urban migration

China	1	2	3	4	5
real GDP	0.02	0.08	0.13	0.17	0.20
private consumption deflator	0.00	0.02	0.05	0.15	0.20
GDP deflator	0.00	0.01	0.02	0.08	0.12
real exchange rate	0.00	0.00	0.00	0.00	0.01
national saving-to-GDP ratio	-0.03	-0.14	-0.25	-0.35	-0.42
investment-to-GDP ratio	0.00	-0.02	-0.02	-0.02	-0.02
exports-to-GDP ratio	-0.01	-0.03	-0.05	-0.09	-0.12
imports-to-GDP ratio	0.0	0.0	0.1	0.2	0.2
	1	9	9	4	9
current account-to-GDP ratio	-0.02	-0.12	-0.24	-0.33	-0.41
United States	1	2	3	4	5
real GDP	0.00	0.00	0.00	0.00	0.00
GDP deflator	0.00	0.00	0.00	0.00	0.00
current account-to-GDP ratio	0.00	0.00	0.00	0.00	0.00
Euro area	1	2	3	4	5
real GDP	0.00	0.00	0.00	0.00	0.00
GDP deflator	0.00	0.00	0.00	0.00	0.00
current account-to-GDP ratio	0.00	0.00	0.00	0.00	0.00
Japan	1	2	3	4	5
real GDP	0.00	0.00	0.00	0.00	0.00
GDP deflator	0.00	0.00	0.00	0.00	0.00
current account-to-GDP ratio	0.00	0.00	0.00	0.00	0.00
World	1	2	3	4	5
real GDP	0.00	0.00	0.01	0.01	0.01

Note: Permanent increase in the rate of growth of urban population by 2 per cent points above the baseline growth rate (see Table 6). Per cent deviations from baseline (per cent points deviations for the variable expressed as ratio to GDP).

8. Figures

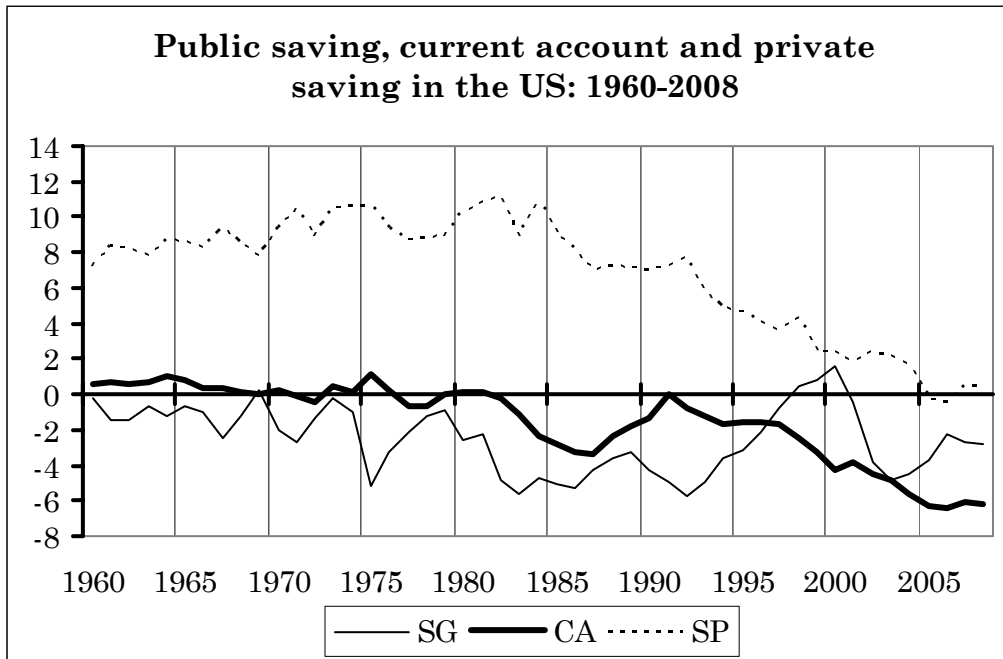


Figure 1 – Public saving, current account and private saving in the US (GDP points); source: OECD (2005, 2007).

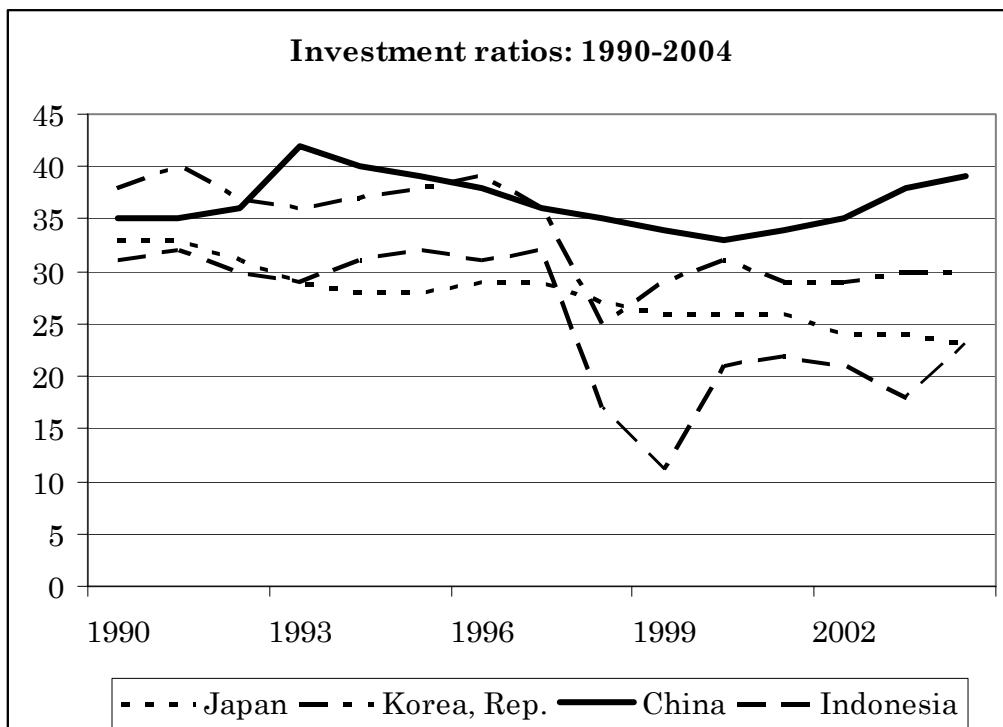


Figure 2 – The investment-to-GDP ratios in some leading East Asian economies; source: OECD (2005).

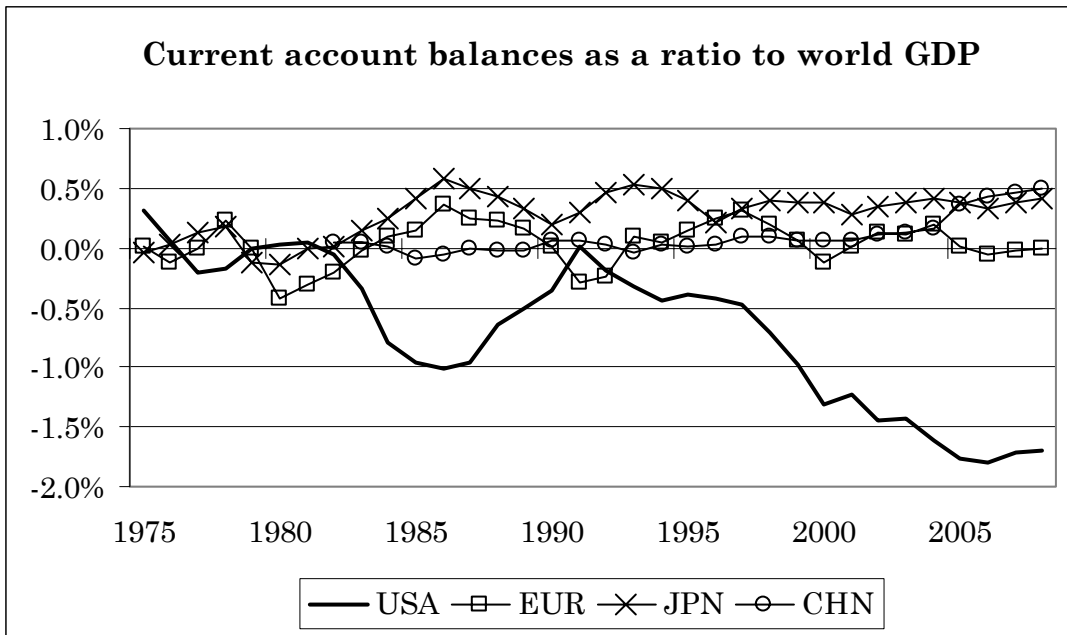


Figure 3 – The current account-to-GDP balance in the four major poles of the world economy; source: OECD (2005, 2007).

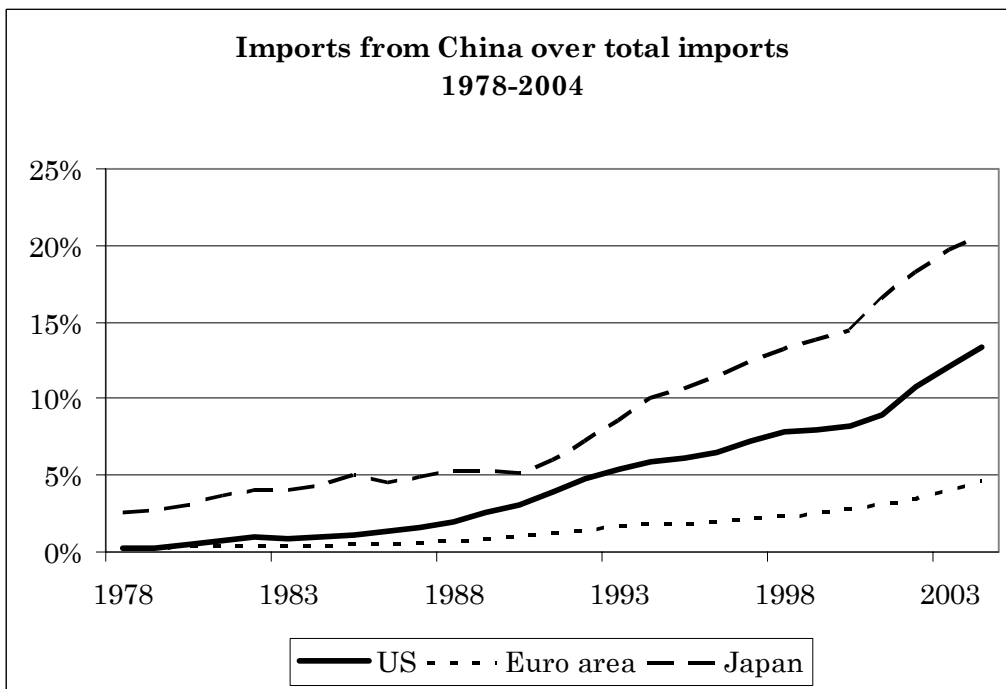


Figure 4 – The shares of imports from China over total imports in selected OECD countries; source: OECD (2005, 2007).

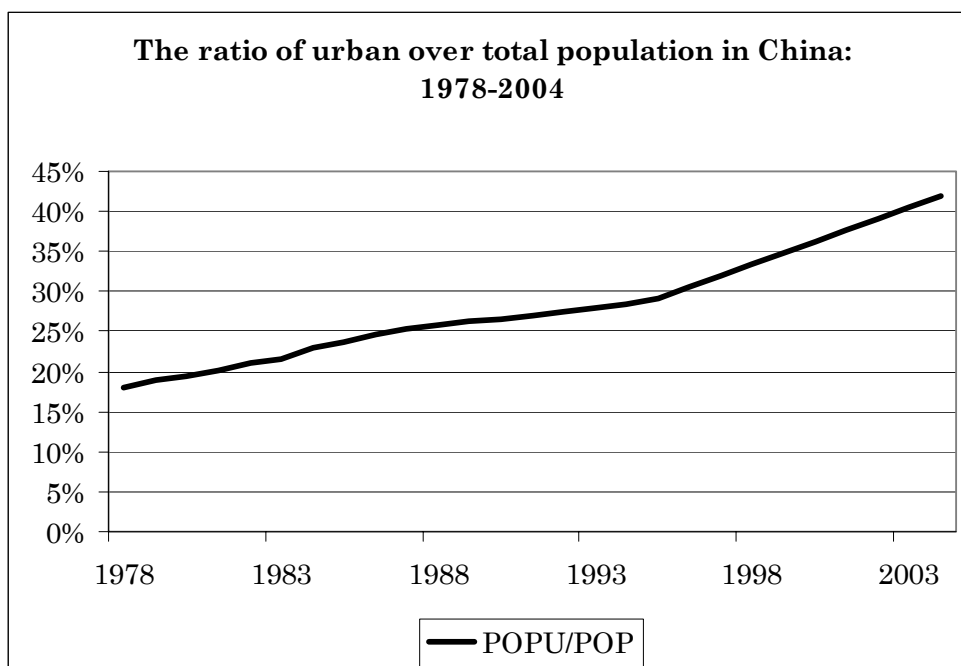


Figure 5 – The share of urban over total population in China from 1978-2004; source: NBS (2006).

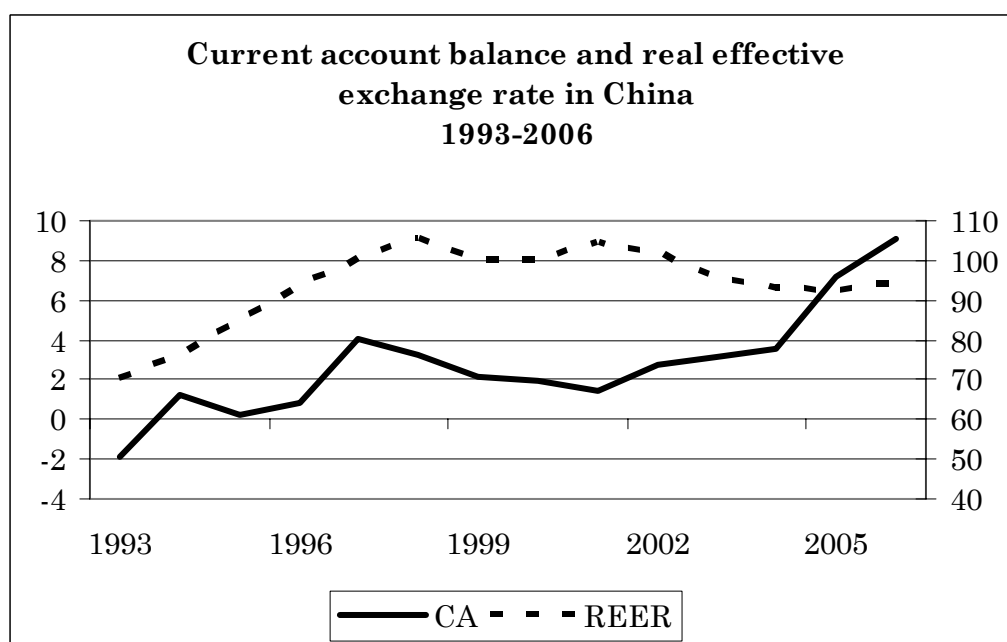


Figure 6 – Current account balance (GDP points, left scale) and the real effective exchange rate (right scale) in China; source: World Bank (2006).

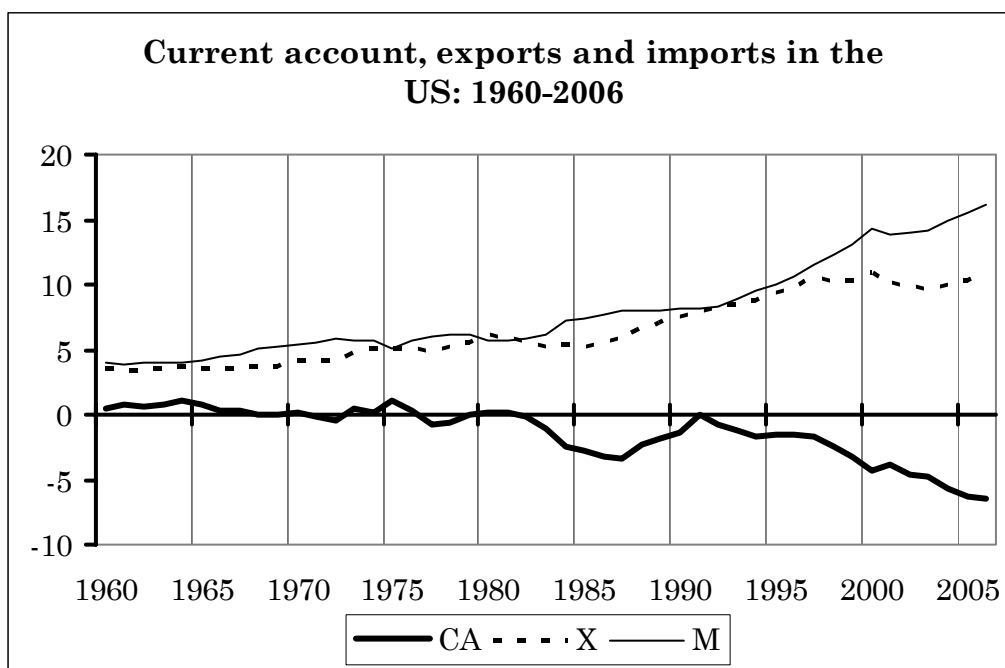


Figure 7 – The current account balance, exports and imports in the US as a share of GDP (source: model database).