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Re-balancing China: Linking internal and external reforms

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Abstract

The re-balancing of the Chinese economy requires the linking of internal and external sector reforms. The shift toward greater domestic demand necessitates a series of measures, including the adjustment of interest rates and the exchange rate. A more balanced Chinese economy would generate more sustainable growth, particularly as global macroeconomic imbalances fall from its pre-crisis peak.

Keywords: Global imbalances, China

JEL codes: F02, F19, F41

1. Introduction

This paper argues that the “re-balancing” of the Chinese economy away from exports by increasing the share of GDP generated by domestic demand would support a more sustainable economic growth approach. This type of re-balancing is a realistic reaction to weaker expected import demand by the West as the United States in particular recovers from the worst financial crisis since the 1930s. Figure 1 shows the increase in net exports alongside the decline in consumption as shares of GDP starting in the early 1990s when the “open door” policy took off in China. The current account surplus, nevertheless, was not large until the 2000s when China acceded to the World Trade Organization (WTO) in December 2001. This is seen in Figure 2, which shows that both exports and imports grew rapidly since the early 1990s, but the large trade surplus was apparent after 2002.

FIGURE 1 HERE

FIGURE 2 HERE

In 2009, China achieved a 9.6 percent share of global trade, surpassing Germany with 9.0 percent and the United States with 8.5 percent, to become the world’s largest trader. The trade shares of the three largest traders dwarfed the share of the fourth largest trader, Japan, which accounted for 4.7 percent. Arguably for China, there is limited scope for growth from this high level because the United States, the world’s largest importer, which averaged \$1.48 trillion of imports per annum since 1998 and imported \$2.17 trillion in 2008, is unlikely to maintain this level of imports as consumption has fallen from its peak at 72 percent of GDP on the eve of the

financial crisis. Those heady rates were unsustainable, as the global financial crisis reflected an unsustainable consumption boom fuelled by rapid credit expansion in the United States (Rajan 2010). Figure 3 shows that the global economy has begun to re-balance since 2007. The current account deficit has fallen in the United States and the surpluses of China, Germany, and Japan have come down as well.

FIGURE 3 HERE

For China to sustain its growth rate, it will need to re-orient more toward domestic demand. However, re-balancing China will not completely re-balance the global economy. The United States ran a current account deficit before China's integration in the world economy in the early 1990s and is argued to continue to do so for a variety of reasons including its fiscal and savings deficit (Bergsten 2009; Chinn and Ito 2008), financial specialization (Cabellero, Farhi, and Gourinchas 2008a, 2008b), and reserve currency status (Yueh 2010). The continuation of global imbalances, however, raises concerns about the management of China's current account surplus, as that surplus has hitherto generated foreign exchange reserves of \$2.8 trillion by the end of 2010.

To do so, China should institute liberalization of the capital account and reform of the domestic capital market to reduce reserve accumulation by generating more capital outflows. Therefore, re-balancing the Chinese economy in the post-crisis environment will require both interest rate liberalization and greater exchange rate flexibility (see also Woo, 2008, for an insightful discussion about exchange rate adjustment and a wider set of reforms in the pre-crisis context;

see also Bosworth and Collins, 2008, estimating that U.S. exports to China are determined by a wide range of factors and not due to the exchange rate). Re-balancing the economy toward domestic demand is also a realistic development path for China because its vast population should be able to support a large domestic consumption of goods.

The paper is organized as follows. Section 2 outlines the coordination of internal and external re-balancing in the Chinese economy utilizing the Salter-Swan model. Section 3 details the reforms necessary to achieve a more balanced economy. Section 4 concludes with an examination of lingering global imbalances and the implications for further liberalization of the capital account for China.

2. Re-balancing China

The recommendations in this paper for the re-orientation toward domestic demand in China is based on the recognition of (1) the likely weakness of global trade in the aftermath of the 2008 financial crisis and (2) the longer-term growth policy that aims to create an upper middle income country with a significantly larger middle class. For China to achieve a more stable economic growth model, it will need to institute reforms that can boost domestic demand while promoting global integration.

2.1 The structure of the Chinese economy

The structure of the Chinese economy can evolve to become more akin to the United States and Japan, which are both large economies whose growth is primarily driven by domestic demand

but at the same time are among the largest (third and fourth, respectively) traders in the world. Figure 4 shows that in 1990, China was closer to the structure of the economies of the United States and Japan in that exports accounted for 12.9 percent of GDP in China and around 7 percent in the United States and Japan. Since the “open door” policy took off, China’s trajectory became more similar to Germany. Exports in 2007 accounted for 56 percent of Chinese GDP and for 76 percent of German GDP (though intra-European trade in the single market accounts for around three-quarters of German trade). In 2009, when global trade contracted for the first time since World War II by 12.2 percent according to the WTO, both Germany and Japan experienced recessions that were worse than the United States (the epicenter of the financial crisis). In China’s case, despite the large-scale unemployment of workers in export industries, a technical recession was avoided because of the fast implementation of fiscal and monetary stimulus that succeeded in raising domestic demand significantly.

FIGURE 4 HERE

China could reduce its exposure to the volatility of the world economy by following a path to strengthen both internal and external demand, which can cause the portion of growth to be driven by domestic demand to increase even as trade could expand in absolute terms. Such restructuring allows China to continue to benefit from global integration that includes learning from the technological advancements of developed economies and to continue its “catch up” growth, while maintaining a larger base of domestic demand to shield it from the worst excesses of external shocks.

To orient toward domestic demand means boosting consumption in China, i.e. reducing the savings tendencies of households and firms. Figure 5 shows the increase in saving as a share of GDP, particularly notable in the 2000s. Consumption fell from around 50 percent of GDP in the 1980s and early 1990s to nearly one-third by the late 2000s. In developed economies, consumption is typically between half to two-thirds of GDP e.g., in Germany it is 58 percent, Japan registers 60 percent and it was 72 percent in the United States on the eve of the 2008 global financial crisis (the latter was generally considered to be too high; McKibbin and Stoeckel 2010).

FIGURE 5 HERE

For Chinese households, precautionary savings motives are important to address, particularly in rural areas, and so there should be a substantial improvement in social security provision. There was some provision in the government's stimulus plan of 2009, which increased health and pension spending, but more is needed. Developing the service sector will also boost domestic demand by increasing the non-tradable component of the economy and by creating jobs in the low and high end of the skills spectrum. Furthermore, greater urbanization can improve the earning potential of rural residents and boost consumption. Indeed, wage bills that have lagged behind output growth reduced the share of income to workers, which in turn depressed consumption and caused it to shrink as a share of GDP (Bai and Chen 2009).

Figure 5 also shows an increase in savings by firms (state-owned and non-state-owned) during

the 2000s. China's distorted financial system is biased toward state-owned enterprises (SOEs), and private firms have trouble obtaining credit—whether from banks or the underdeveloped domestic capital markets. Therefore, private firms rely heavily on retained earnings to finance their growth. Even SOEs save because of the minimal taxation of their profits. It is noteworthy that when China's current account surplus was near 10 percent of GDP after 2004, China's investment maintained its share of GDP, even though investment is typically squeezed when countries develop a current account surplus.

Figure 6 shows gross capital formation as a share of GDP and its constancy for the past 20 years. Consumption dropped as the motives for saving were undiminished by the export boom, and total savings rose instead. Reforming the internal and external sectors would help to re-balance the Chinese economy.

FIGURE 6 HERE

2.2 The Salter-Swan framework

In the Salter-Swan model with both a tradable and non-tradable goods sector, the relative supply and demand for tradable versus non-tradable goods determines the real exchange rate. It shows why China is experiencing appreciation pressure and how exchange rate reform can aid in re-balancing the Chinese economy away from exports toward a greater share of domestic demand in GDP.

Following Dornbusch (1980), a small, open economy produces two goods, a traded good (T) and a non-traded good (N). The price of the traded good (P_T) is determined by the level of the nominal exchange rate E (RMB per U.S. dollar) and of foreign tradable goods' prices (P^*). The price of the non-tradable good (P_N) is determined by the equilibrium in the market for non-tradables.

Producers in each sector maximize profits subject to declining marginal products of labor, the only variable input:

$$\text{Max } P_i Q_i - W L_i \quad (1)$$

subject to:

$$Q_i = Q_i(L_i)$$

$$Q_i'() > 0, Q_i''() < 0$$

$$i=N, T$$

$$W = \text{wage rate}$$

Profit maximization in each sector leads to implicit labor demand computed as a function of real wages:

$$L_T = L_i(W/P_i) \quad (2)$$

$$L'() < 0$$

Conditional on the prices of traded and non-traded goods, the wage rate (W) equates the sum of labor demand in the two sectors to the total labor supply:

$$L_T(W/P_T) + L_N(W/P_N) = L \quad (3)$$

Log-differentiating, equilibrium wages (W) is a function of the changes in non-tradable prices (P_N) and tradable prices (P_T):

$$\hat{W} = \gamma \hat{P}_T + (1 - \gamma) \hat{P}_N \quad (4)$$

Shifts in real wages in the two sectors reflect changes in relative prices:

$$\hat{W} - \hat{P}_T = (1 - \gamma) (\hat{P}_N - \hat{P}_T) \quad (5)$$

$$\hat{W} - \hat{P}_N = \gamma (\hat{P}_T - \hat{P}_N)$$

Based on (1), (2) and (5), the supplies of traded and non-traded goods in terms of relative prices, or equivalently, the real exchange rate, θ or P_T/P_N , is given by:

$$S^T = S^T(P_T/P_N), S^{T'}(\cdot) > 0 \quad (6)$$

$$S^N = S^N(P_T/P_N), S^{N'}(\cdot) < 0$$

Turning now to demand for tradable and non-tradable goods; these are determined by relative prices and domestic demand or absorption, A . Sectoral demand is decreasing in the relative price of that sector's good and increasing in the level of total demand:

$$D^T = D^T(P_T / P_N, A) \quad (7)$$

$$\partial D^T / \partial (P_T / P_N) < 0,$$

$$\partial D^T / \partial A > 0$$

$$D^N = D^N(P_T / P_N, A)$$

$$\partial D^N / \partial (P_T / P_N) > 0,$$

$$\partial D^N / \partial A > 0$$

Equilibrium in the markets for traded and non-tradable goods is established through (6) and (7) and depicted in Figure 7. The NN curve shows the combinations of the real exchange rate and absorption that generates equilibrium in the market for non-tradables. Increases in absorption (A) lead to excess demand for non-tradables and raise their relative price, i.e., an appreciation of the real exchange rate.

FIGURE 7 HERE

If non-tradable prices do not move quickly to equate supply and demand for non-tradables, then the economy can be off the NN curve. The adjustment of non-tradables' prices to excess supply or demand for non-tradables will move the economy back onto the NN curve over time. If the economy is above the NN curve, there is excess demand for non-tradables and the real exchange rate is lower than its equilibrium value. At this point, demand pressures will raise the prices (P_N) of non-tradables until the real exchange rate (P_T/P_N) appreciates to move the economy back onto the NN curve. Conversely, if the real exchange rate is higher than its equilibrium value and the economy is below the NN curve, then the non-tradables' prices will fall and non-tradables deflation would move the economy back onto the NN curve and restore equilibrium.

The TT curve completes the Salter-Swan model. It represents combinations of the real exchange rate and absorption for which the demand for tradables equal supply, that is, a balanced trade position. Greater absorption would lead to more demand for tradables and thus a trade deficit that requires depreciation of the real exchange rate to correct (if the trade balance is to be maintained). Or, low absorption would reduce the demand for tradables and lead to a trade surplus that requires appreciation of the real exchange rate to maintain the trade position.

Where there is substantial net capital flows, the Salter-Swan framework suggests much stronger forces moving the real exchange rate toward equilibrium along the NN curve than along the TT curve. This is because the equilibrium real exchange rate produces a balanced current account

at a level of output corresponding to equilibriums in both the non-tradables and tradables markets (where the NN and TT curves cross). This is the real exchange rate that is sustainable in the long run, but adjustments can be very slow in the short and medium term, depending on the extent to which trade imbalances are financed by capital flows and the exchange rate regime. Excess demand or supply of tradable goods (when the economy is off the TT curve) lead initially to only trade deficits or surpluses, respectively. Imbalances in the tradable market do not affect the price of non-tradable goods or directly affect the price of tradables since those prices are fixed by the exchange rate and the price of foreign tradables. Also, trade imbalances may be associated with excess demand or supply of foreign exchange that could lead to adjustments of the nominal exchange rate, which then move the real exchange rate back onto the TT curve, depending on the flexibility of that exchange rate regime.

Now, the framework can be re-written to model the domestic demand components that explicitly describe a three-way trade-off among the net trade, aggregate demand, and output/unemployment positions (Carlin and Soskice 2005, Chamberlin and Yueh 2006; see also Bean 2009). Re-stating the trade balance or BT schedule as follows:

$$\frac{x_{Y^*}(\theta)Y^*}{\theta m_Y(\theta)} = Y_{TB}, \quad (8)$$

where x_{Y^*} is the propensity to consume domestic goods, which is positively related to the real exchange rate, $\theta = \frac{EP^*}{P}$, derived as earlier as the ratio of foreign to domestic prices P , where P is a weighted combination of domestic (P_D) and imported prices (P_M) and the respective weights ϕ and $(1 - \phi)$ reflect the portion of domestic and foreign goods sold in the home

market: $P = \phi P_D + (1 - \phi)P_M$. Y^* is the overseas level of income, and the propensity to import $(m_Y(\theta))$ is a negative function of the real exchange rate. The level of income where the trade balance is in equilibrium is Y_{TB} when $BT = 0$, where exports are equal to imports:

$$x_{Y^*}(\theta)Y^* = \theta m_Y(\theta)Y$$

FIGURE 8 HERE

The effect of the real exchange rate on the level of income when the trade balance is in equilibrium will depend on the relative strengths of the competitiveness and terms of trade effects. The substitution effect will dominate when the Marshall Lerner condition holds, that is, the price elasticity of exports and imports sum to greater than 1. Provided that the Marshall Lerner condition is satisfied, an improvement in competitiveness enables the trade balance to remain in equilibrium at higher levels of domestic income. Therefore, the BT curve will slope upwards as seen in Figure 8. In other words, when income rises, imports will increase. Therefore, to keep the trade balance in equilibrium at this higher level of income depends on substitution toward domestic goods through an improvement in competitiveness. This requires a real depreciation, accounting for the upward sloping BT curve.

The aggregate demand (AD) schedule is given by:

$$Y_{AD} = \frac{a + I(\Theta, r) + \bar{G} - cT + x_{Y^*}(\theta)Y^*}{(1 - c + \theta m_{Y^*}(\theta))}, \quad (9)$$

where consumption is a function of autonomous consumption (a), the marginal propensity to consume (c), and personal disposable income ($Y-T$), where T is the level of lump sum taxes:

$C = a + c(Y - T)$; investment is a function of autonomous factors (Θ) such as expectations, taxes, credit restrictions, etc., and a negative function of the interest rate (r): $I = I(\Theta, r)$,

$\frac{\Delta I}{\Delta r} < 0$; government spending and lump sum taxes are exogenously determined: $G = \bar{G}$,

$T = \bar{T}$; and, net exports are calculated as the trade balance: $X - M = x_{Y^*}(\theta)Y^* - \theta m_Y(\theta)Y$.

If the Marshall Lerner condition holds, the AD schedule will also be upward sloping. The AD schedule incorporates the trade balance, which is also an upward sloping schedule, but it is flatter since most of the domestic components in the AD curve are invariant to changes in the exchange rate.

Finally, the Competing Claims Equilibrium (CCE) is the long run aggregate supply curve in an open economy, determined by the Non-Accelerating Inflation Rate of Unemployment (NAIRU) and the equilibrium level of output, which completes the framework. The derivation is in the Appendix.

With a trade surplus, China is at point a in Figure 8 where potential output is Y_I which is to the left of the BT schedule. This can be sustained for some time before the economy accumulates an increasing number of assets, which leads to a build-up of liquidity pressures to move the economy onto the BT schedule at point b . Even with capital controls in place, the accumulation of assets due to maintenance of the fixed exchange rate will generate liquidity in the economy, which can be sterilized by the central bank (Riedel, Jin and Gao 2007). But, leakage through

porous borders means that “hot money” flows will plague China as it does for most open economies (see Blanchard and Giavazzi 2006).

As domestic prices rise as a result of the inflows of liquidity, which generates upward pressure on asset prices in the non-tradable sector (P_N) such as the price of real estate, which has been rising rapidly in major cities, the real exchange rate (θ) will appreciate (P_T/P_N) since the nominal exchange rate (E) is fixed. The economy would shift from a at θ_1 to a point above the CCE line.

As the adjustment in prices continues, the economy will move toward point b , which is the long run equilibrium of the economy or the sustainable level of output, Y_s , which is at a higher level of output than Y_1 . But, it may not reach point b and instead move to a' as the price adjustment is likely to be slow and thus the economy is unlikely to be completely “re-balanced” because there will still be a trade surplus. But, the gradual re-valuation of the RMB will ease some of the price pressures. This is sustainable for a period of time depending on the ability to sterilize the portfolio inflows, which China has been able to achieve to a large extent under a regime of financial repression whereby bills from the People’s Bank of China are purchased by state-owned commercial banks (see e.g., Riedel, Jin, and Gao 2007).

Even at a' , output and aggregate demand (Y_1') have increased from Y_1 . These are wrought through a positive real income effect as the appreciation of the RMB increases the purchasing power of households with respect to imports. The other policy tool in this framework that can

be adjusted to reach b is the real interest rate via the AD curve. An expansion of AD with a revaluation of the exchange rate suggests a lower equilibrium interest rate.

At present, there are different lending and deposit rates in China. For households, their consumption decisions are affected by the current “ceiling” on the deposit rate. Liberalizing the interest rate could lead the deposit rate to rise and therefore household incomes even as the lending rate falls because the equilibrium rate of interest in the economy is likely to be in-between the “ceiling” on the low deposit rate and the “floor” on the lending rate.

More apparently for firms, investment is the avenue through which interest rates operate in the Salter-Swan framework. Investment is a function of a variety of policies, but also of the real interest rate: $I = I(\Theta, r)$. Corresponding to the price falls associated with the re-valuation of the exchange rate, the liberalization of interest rates through the removal of the “floor” on the lending rate would lower the cost of borrowing. Although the level of investment is high, the dominance of SOEs and the distortions in the credit system suggest that the allocation of capital can be done in a more efficient and market-based manner. In other words, liberalizing interest rates can improve the mix of investment as between the state-owned and private sectors to increase output. This reform would have the further effect of reducing the savings rate of corporations that has expanded along with household savings with consumption correspondingly falling to a historic low. With more efficient investment, output will increase as the capital expenditure is more productive.

Therefore, over the longer term, a series of price and liquidity pressures will move the Chinese economy toward its equilibrium level of output. Through reforms of two key linked policy instruments, i.e., increasing the flexibility of the exchange rate and the interest rate, the adjustment to a future with a smaller trade surplus can be managed in a way that increases the level of income and reduces inflationary pressures, particularly the increases in non-tradable asset prices such as real estate, which can be moderated through an appreciation of the nominal exchange rate. The next section outlines the specific reforms and the challenges lying therein to achieving a more sustainable internal/external balance.

3. Reforms

The policy reforms needed to increase aggregate demand in this framework center on reducing the savings rate of households and firms to generate higher output in the context of a smaller trade surplus. Greater government spending can also increase consumption and investment if undertaken to support income and the efficiency of capital markets.

Household savings have averaged 19 percent of GDP since 1992, after the significant opening of China associated with the decline in consumption (see Figure 5). Savings was high, but it increased further by 8 percentage points of GDP from 2000, increasing from 14 percent to 22 percent of GDP by 2007 at the onset of the global financial crisis. For firms, the average savings rate was lower at around 15 percent of GDP from 1992-2007, but grew quickly to reach 22 percent of GDP by the mid 2000s. The remainder of the savings derives from government, whose savings rate had been around 5 percent since 1992, but increased dramatically from 5.2

percent in 2000 to 10.8 percent in 2007. Taken together, China's savings rate increased from 38 percent of GDP in the 1990s to peaking at nearly 52 percent by the late 2000s. Startlingly, the savings rate increased by 17 percentage points during the 2000s (34 percent in 2000 rising to 51.9 percent in 2007), which mirrors the fall in consumption as a share of GDP from around 50 percent of GDP in the early 1990s to 35 percent by the late 2000s.

Therefore, for households, the issues center on lagging wage and income growth, while for firms, reforming capital markets is critical. For both sectors, the reforms require adjustments to both the internal and the external balances, consistent with the analysis of the previous section's open economy model.

3.1 Household savings

For households, income growth and removing the motives for pre-cautionary savings would bring down the savings rate. Industrial output has grown at 14.1 percent on average per annum for 20 years since 1988 (deflated growth of gross industrial output), but wage growth has not kept pace. Industrial output grew at double the previous pace in the 2000s (23.1 percent on average per annum) as compared with the two decades before (11.7 percent). Yet, the average annual real wage growth of urban employees was lower at 11.9 percent from 1995 to 2008 and only a paltry 5 percent during the late 1990s. Rural incomes have risen even more slowly. In the 2000s, average wage growth was faster and closer to 15 percent at 14.9 percent per annum, but this is against a backdrop of industrial output growth exceeding 23 percent each year. Thus, because labor income has lagged behind output growth, consumption has fallen as a share of

GDP.

Moreover, labor productivity has increased some seven-fold from 1980 to 2005, according to the International Labor Organization (see also Yueh 2008), which suggests that wages do not match the marginal product of labor. Labor productivity has been improving in the 2000s since the significant reform of labor markets at the end of the 1990s and the improvement has been hastened by recent supply side tightening. The protests in 2009/10 over low wages and a reluctance of rural migrants to return or move to the cities reflect the potential for increased wage growth to match the marginal output of labor. In so doing, there need not be inflationary pressures so long as higher wages prompt growth in labor productivity that outstrips the wage increases and instead can increase incomes that boost consumption.

Other measures that can ease labor market tightness involve removing restrictions on mobility, that is, increase urbanization to allow migrants to settle in urban areas. It would reduce the segmentation in the labor market and increase the mobility of workers to find matches to appropriate jobs and not be barred by geographic or *hukou* (household registration system) barriers. Urbanization is a policy that has been proposed alongside renewed efforts to develop the services sector. As seen in Figure 9, the services sector increased steadily as a share of GDP from 23 percent in 1979 to 40 percent in the 2000s but has not developed further, leading China to have a lower share of services in GDP than comparable-sized economies where the services sector account more than half of GDP (e.g., over 50 percent in Germany, over 70 percent in the United Kingdom). Services is a non-tradable sector as it includes items such as hair cuts and government services that would help to increase both domestic demand and reduce savings if

such service provision included the delivery of social security. As such, government spending on services can reduce the savings rate of the economy while boosting domestic demand and incomes (see also, Blanchard and Giavazzi 2006). Urbanization further allows the delivery of services to be distributed more efficiently such that there can be greater economies of scale. For instance, health, pensions, unemployment, local services, and schools can all be developed as part of the services sector with the infrastructure needs to support this development, which increases the efficiency of investment and associated industrialization in the urban area.

FIGURE 9 HERE

As such, internal and external sector reforms together would improve the efficiency of the urbanization process by reducing the cost of imported inputs. It would further help on the income side for households since a stronger RMB would reduce the cost of imports, particularly food, and increase disposable income. Removing the “ceiling” on deposit rates would also increase interest income to households, which has plunged into negative territory with inflation exceeding the deposit rate in the late 2000s. The combination of internal and external re-balancing would thus assist with reducing household savings and increase output.

3.2 Firm savings

Further liberalization of interest rates would improve credit allocation to non-state sector firms and reduce the savings incentive for firms too. Although interest rates were partially liberalized, including in 2004 when the ceiling on inter-bank lending rates was lifted, there are still limits in terms of the “floor” on the lending rate. Interest rates reflect the internal rate of

return to investment, so such controls distort lending decisions. These restrictions preserve bank margins in the same way that capital controls preserve the deposit base, but they lead to high rates of corporate saving.

FIGURE 10 HERE

The allocation of capital should be more efficient even though the rate of investment may not increase. This suggests greater output for the same amount of invested funds. For instance, the return on assets is high in China, but it is greater for all types of private firms than SOEs and collectives (Figure 10). Yet, SOEs continue to receive disproportionate amounts of credit despite being less productive (see e.g., Shen *et al.* 2009; Huang and Wang 2010 for measures of credit distortion and financial repression). Without interest rate liberalization and further reforms of the financial system, the extent of financial repression distorts credit allocation and induces savings by private firms, which has contributed as much as households to the increase in the savings rate in the 2000s. Wages below the marginal product of labor also generate profits, but capital market reform will reduce the distortions to firm savings behaviour, particularly if it is linked to capital account reform.

Gradual capital account liberalization, in particular the “going out” policy that is encouraging Chinese firms to operate as multinational corporations, can reduce savings if firms are permitted to operate in global markets and are allowed to access funding from better-developed overseas credit markets. In other words, firms can raise money on capital markets and not just rely on China’s banking system with its controls on credit.

There are also a number of macroeconomic benefits. Capital account reform would not only reduce the motive for corporate savings but also cut the portion of the current account surplus that is funded through the purchase of U.S. Treasuries by allowing capital outflows in the form of investments instead of accumulated in foreign exchange reserves that is discussed further in the next section.

The exchange rate should also become more flexible with greater capital account liberalization since the capital account and the current account will require the RMB for transactions. Recent measures to increase the use of the RMB in trade arrangements already point to the growing internationalization of the Chinese currency. Therefore, exchange rate and interest rate reforms together should produce a better balance between China's internal (savings/investment) and external (balance of payment) positions and help to re-balance the economy.

4. Conclusion

Global imbalances have existed for some decades and their exacerbation in the 2000s formed the backdrop to the worst financial crisis in a century. But, in the short-term, the world has already somewhat re-balanced with the U.S. current account deficit falling from 6 percent to around 3 percent of GDP in 2010 (some like Bergsten 2009 argue this amount is consistent with the global reserve currency need) and savings has risen in recessionary countries. It further implies that China and other countries will need to re-balance their economies to sustain the rate of growth of the 2000s, which was driven by strong U.S. imports and demand.

For surplus countries like China, American U.S. loose monetary policy can be transmitted via fixed exchange rates, which leads capital to flow from low to high interest rate economies. Thus, China should gradually reform its exchange rate to prevent domestic asset bubbles like price increases in the non-tradable real estate sector. Increasing the flexibility of the RMB exchange rate before tightening monetary policy will also be important as an increase in the interest rate in China while the United States maintains a near-zero interest rate (which the Federal Reserve has said that it will keep in place for an extended period of time) will only worsen the capital inflow, eroding the impact of the tightening measures.

Therefore, reforming the exchange rate and the interest rate can induce higher output growth if the switch to higher consumption can be managed while the trade surplus is smaller. The continuation of global imbalances further implies that such liberalization must be carefully regulated to prevent destabilizing capital flows as global liquidity will remain an issue (see also Bernanke 2005). Re-balancing China will not correct global imbalances, but the acute management of the trade surplus along with a recognition that such action will have some effect on re-balancing the global economy will mean a more sustainable growth path for China and perhaps the world economy.

Appendix: Deriving the CCE curve in the Salter-Swan model

In an open economy, the long run aggregate supply curve is referred to as the Competing Claims Equilibrium (CCE). The following derives the CCE in an open economy model.

First, in a closed economy, the Non-Accelerating Inflation Rate of Unemployment (NAIRU) and the associated long-run aggregate supply curve are determined by a bargaining equilibrium in the labor market. This is where the price determined real wage (PRW) curve intersects the bargained real wage (BRW) curve, giving equilibrium levels of the real wage and unemployment.

The PRW curve is derived from a firm's price-setting relationship and describes how the price level is determined in the economy. In a closed economy, this was simply a mark up over marginal costs. This can be considered as the price of domestic output (P_D), i.e., the price of output produced by domestic firms:

$$P_D = (1 + \mu) \frac{W}{LP}. \quad (\text{A1})$$

The mark up is μ , and marginal costs are simply the ratio of nominal wages (W) and labor productivity (LP). This can be rearranged to give the PRW:

$$PRW : w = \frac{W}{P} = \frac{LP}{(1 + \mu)}. \quad (\text{A2})$$

In an open economy, the domestic price level, though, will not be solely determined by the price of domestic goods; it will also consist of the price of goods imported from overseas. The

price of imported goods (P_M) will be determined by the foreign price level (P^*) and the nominal exchange rate (E).

$$P_M = EP^* . \quad (A3)$$

The overall price level (P) is then a weighted combination of domestic (P_D) and imported prices (P_M), where the respective weights ϕ and $(1 - \phi)$ reflect the portion of domestic and foreign goods sold in the home market.

$$P = \phi P_D + (1 - \phi) P_M . \quad (A4)$$

By substituting (A2) and (A3) into (A4), the domestic price level can be expressed in terms of all the parameters.

$$P = \phi \left((1 + \mu) \frac{W}{LP} \right) + (1 - \phi) EP^* . \quad (A5)$$

It is clear from (A5) that in an open economy, the domestic price level will be affected by overseas factors. By altering the price of imported goods, changes in the overseas price level or the nominal exchange rate can feed directly into the domestic price level. As the domestic price level is influenced by external factors, it will follow that the same factors will be a determinant of the NAIRU and long-run aggregate supply. The open economy version of the PRW schedule can be derived from (A5).

First, divide both sides by P ,

$$1 = \phi \left((1 + \mu) \frac{W}{LP \times P} \right) + (1 - \phi) \frac{EP^*}{P} . \quad (A6)$$

Next, substitute in for the real exchange rate, $\theta = \frac{EP^*}{P}$:

$$1 = \phi \left(\frac{(1+\mu)W}{LP} \right) + (1-\phi)\theta. \quad (\text{A7})$$

And, finally rearrange,

$$1 - (1-\phi)\theta = \phi \left(\frac{(1+\mu)W}{LP} \right) \left(\frac{W}{P} \right). \quad (\text{A8})$$

$$\frac{1 - (1-\phi)\theta}{\phi} = \left(\frac{(1+\mu)W}{LP} \right) \left(\frac{W}{P} \right). \quad (\text{A9})$$

$$PRW : w = \frac{W}{P} = \frac{1 - (1-\phi)\theta}{\phi} \left(\frac{LP}{(1+\mu)} \right). \quad (\text{A10})$$

The open economy price determined real wage (PRW) schedule in (A10) is an interesting relationship. The closed economy price-setting relationship will simply result if $\phi = 1$.

However, as long as $\phi < 1$, foreign goods will constitute a positive portion of the price level. In this case, the price level will be determined by the real exchange rate, and in particular, the nominal exchange rate and overseas price level. Changes in the real exchange rate will then change domestic prices and the price-determined real wage.

If the real exchange rate appreciates (θ falls), then foreign goods become cheaper so overall domestic prices will fall. As a result, the price determined real wage will rise, shifting the PRW schedule upward. Alternatively, real exchange rate depreciation (θ rises) will make foreign goods more expensive and the domestic price level will rise, shifting the PRW schedule downward.

The other side of the bargaining framework is the wage setting relationship, which describes the real wage that workers will push for at each level of unemployment. This is a downward sloping function because workers will moderate wage claims in times of high unemployment. The bargained real wage (BRW) can then be represented in the following way:

$$BRW : \frac{W}{P} = Z - \beta u . \quad (A11)$$

Z represents a set of exogenous factors that determine the real wage, such as trade union power, minimum wage levels, etc., and β the sensitivity of the real wage to the rate of unemployment (u).

The NAIRU is determined by the intersection of the price setting (A10) and wage setting (A11) schedules. In the open economy, though, there is no longer a unique NAIRU. In fact, the NAIRU will be different depending on the level of the real exchange rate.

As the real exchange rate appreciates, the NAIRU falls – meaning that non-accelerating inflation is sustainable at a lower rate of unemployment. As unemployment falls, workers push for higher wages. This will then raise the costs of firms, and lead to an upward pressure on prices. In the closed economy, the increase in prices would then act to reduce the real wage, meaning that it was impossible to depart from the NAIRU in the long run once wages and prices had fully adjusted.

In an open economy, though, an appreciated exchange rate would give the economy an inflationary subsidy. Falling import prices (P_M) would put downward pressure on the overall price level (P). If unemployment fell, this would put upward pressure on domestic prices (P_D), but this would be offset by the fall in import prices – leaving the overall price level unchanged. Therefore, an exchange rate appreciation enables the economy to move to a lower level of unemployment while maintaining price stability.

Depreciation, of course, would have the opposite effect. Higher import prices means that overall price stability would require a fall in domestic prices and a rise in unemployment. It is clear that in the open economy, the NAIRU will not be uniquely determined, but depend on the real exchange rate θ . The sensitivity of the NAIRU to the real exchange rate will rise as ϕ falls, implying that foreign imported goods are a larger portion of all goods sold in the domestic economy.

In the closed economy, the long-run aggregate supply function was derived from the NAIRU. As there was a unique NAIRU, there was a unique long-run equilibrium level of output where inflation was stable. The long-run aggregate supply curve is simply vertical at this level of output.

The relationship between the NAIRU and the equilibrium level of output is determined in a number of steps. Output is simply a function of employment (N): $Y = F(N)$. The total labor force (L) consists of the total number of employed (N) and unemployed persons (U): $L = N + U$. Dividing both sides by L shows that the relative portions of employed and

unemployed workers in the economy add up to one: $1 = \frac{N}{L} + \frac{U}{L}$. So, $1 = \frac{N}{L} + u$, as $u = \frac{U}{L}$ is the unemployment rate.

Re-arranging this, employment is a function of unemployment, i.e., employment is equal to the portion of the labor force that is not unemployed: $N = L(1 - u)$. If unemployment (\hat{u}) is at the NAIRU, then the long-run aggregate supply level of output (\hat{Y}) will be defined as:

$$\hat{Y} = F(L(1 - \hat{u})). \quad (\text{A12})$$

There is an inverse relationship between the equilibrium level of output and the NAIRU. The CCE is the relationship between the real exchange rate and the equilibrium level of output. From equation (A12), the CCE will be a downward sloping function.

As the exchange rate appreciates, the equilibrium level of output (where inflation is constant) will rise. Note that the slope of the CCE schedule depends on the size of the shifts in the PRW curve for a given change in competitiveness. This is largely determined by the parameter ϕ . If $\phi = 1$, then the foreign price effect on the PRW curve would disappear completely, as imports constitute no part of the domestic price level. In this instance, the NAIRU and the equilibrium level of output will once again be uniquely determined.

If this were the case, the CCE schedule would simply be like its closed economy counterpart and would be vertical at the equilibrium level of output. However, as $\phi \rightarrow 0$, foreign goods are

an increasingly portion of the domestic price level. As competitiveness falls, higher levels of output can be sustained without prices rising, so the CCE curve becomes flatter.

The term, Competing Claims Equilibrium, arises because price inflation results from the competing claims of domestic workers and firms – and, also in the open economy, foreign producers. If domestic workers push for higher wages, they are seeking a larger portion of the economy's output. Alternatively, if firms raise prices, they will seek a higher portion of output by limiting the real wage. Therefore, in a closed economy setting, the wage and price demands made by workers and firms respectively represent each party's attempts to gain at the others expense. The NAIRU represents the level of unemployment where these claims are consistent with a stable rate of inflation.

In an open economy, though, these competing claims take on a further dimension. The real exchange rate defines the claim on domestic resources made by the overseas sector. As the real exchange rate appreciates, the relative price of foreign goods falls, so the claims of the foreign sector on domestic output fall. This means that the claims of domestic workers and firms can then be consistent at lower levels of unemployment. A real exchange rate depreciation has the opposite effect. For this reason, a different real exchange rate can sustain a different NAIRU.

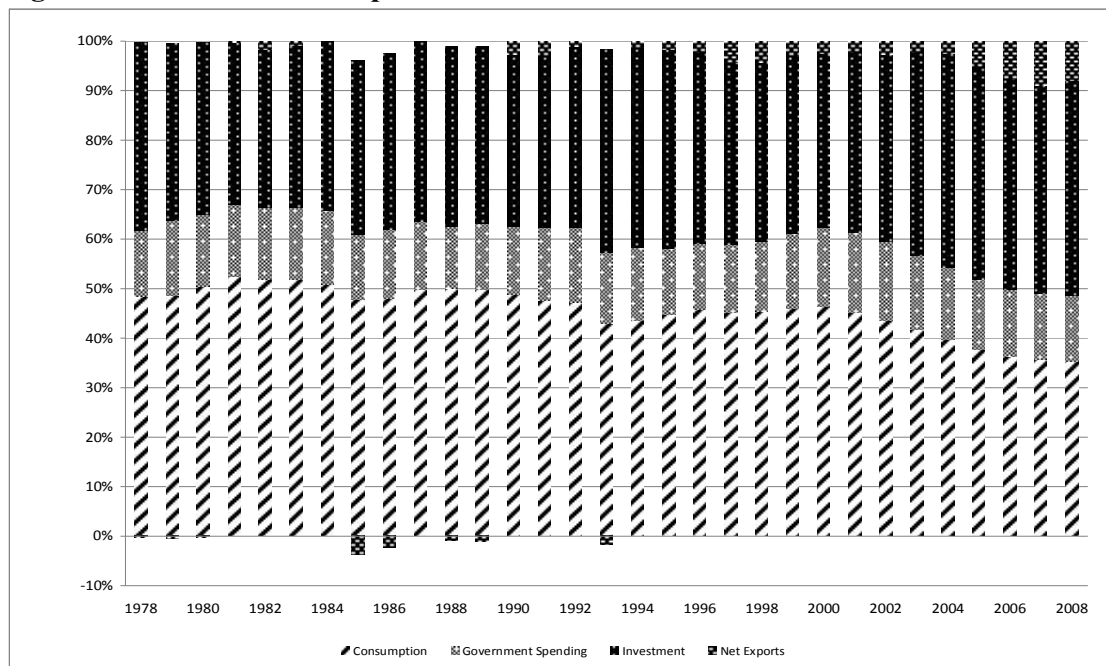
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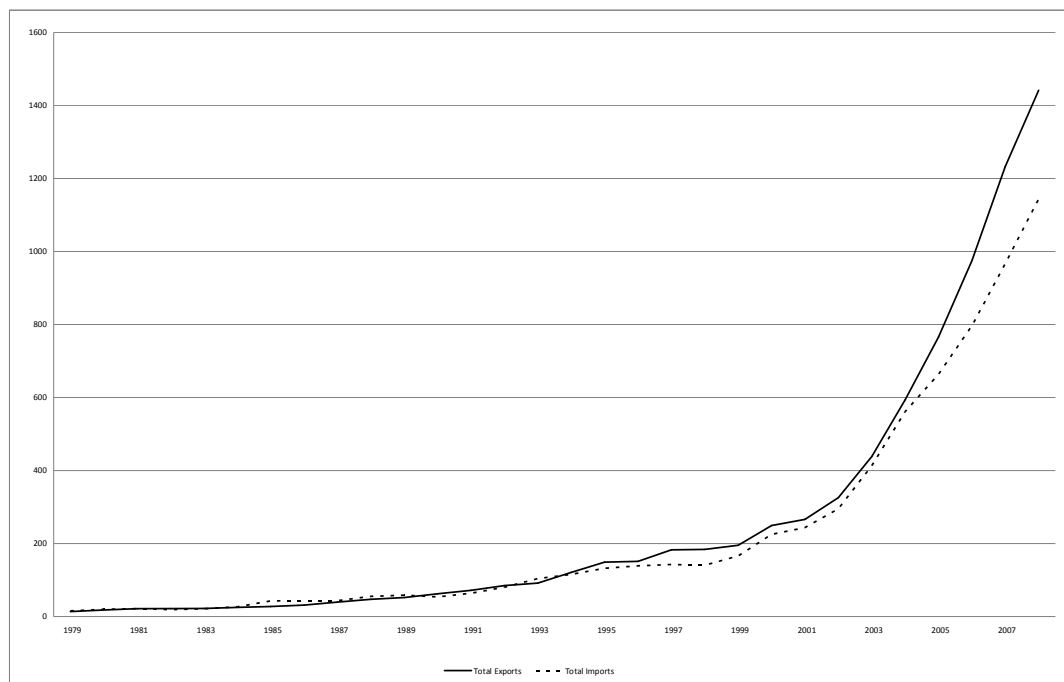
Yueh, Linda. 2010. The U.S., China and Global Imbalances. *China Economic Journal* 3(1): 33-48.

Figure 1. China's GDP components



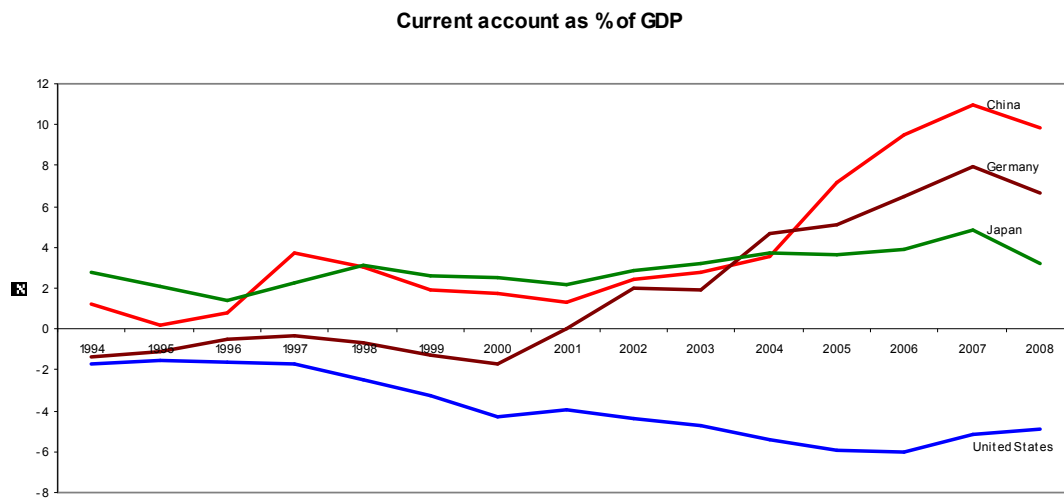
Source: China Statistical Yearbook.

Figure 2. Total exports and imports of China (US\$ billions)



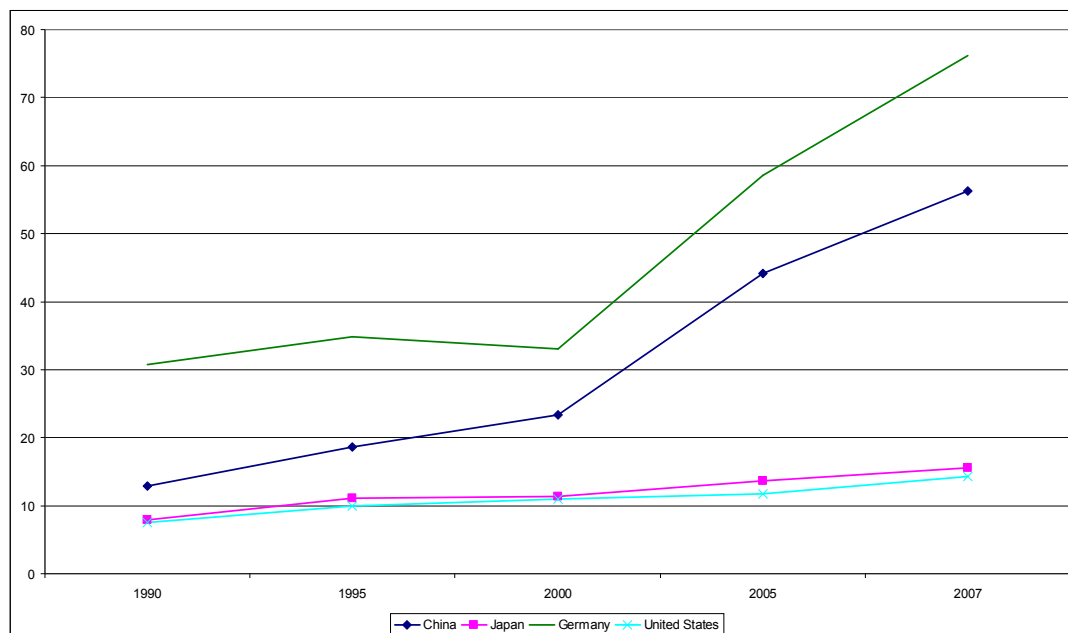
Source: China Statistical Yearbook.

Figure 3. Global imbalances



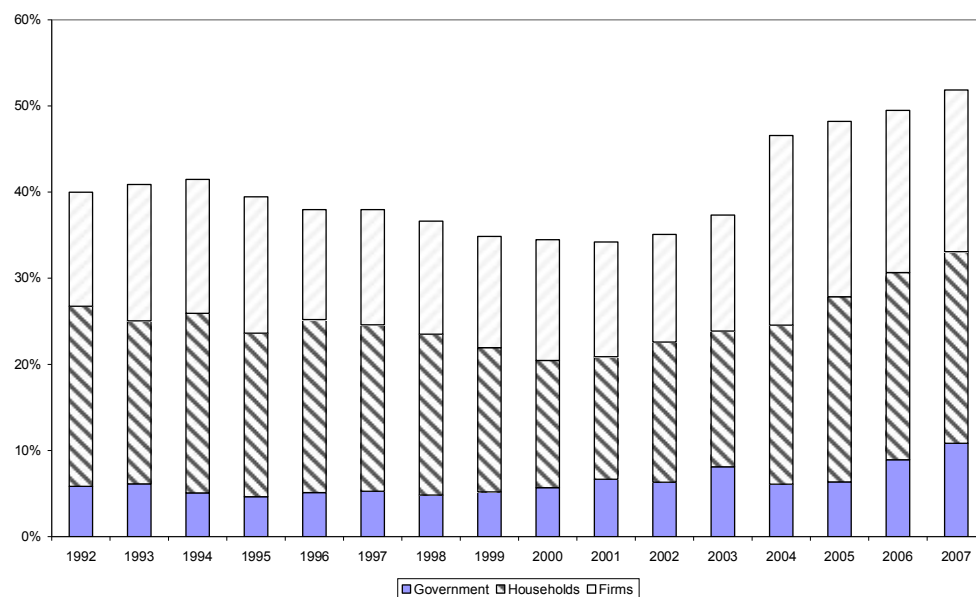
Source: IMF (2009).

Figure 4. Exports as share of GDP (%)



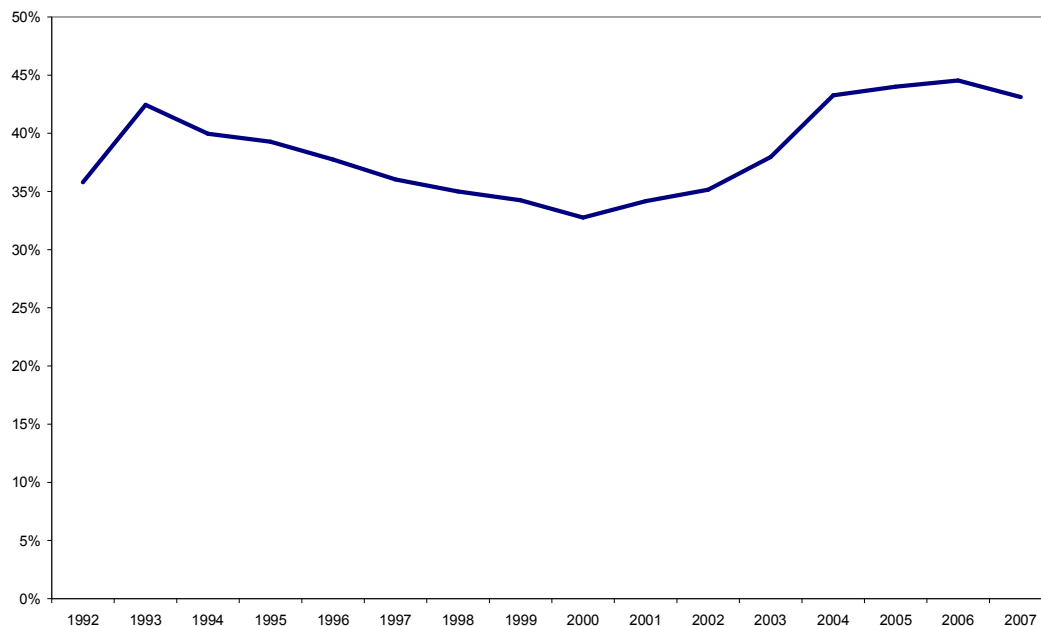
Source: World Penn Tables Version 6.3 August 2009.

Figure 5. Savings as share of GDP in China



Source: China Statistical Yearbook.

Figure 6. Gross capital formation as share of GDP in China



Source: China Statistical Yearbook.

Figure 7. Salter-Swan framework

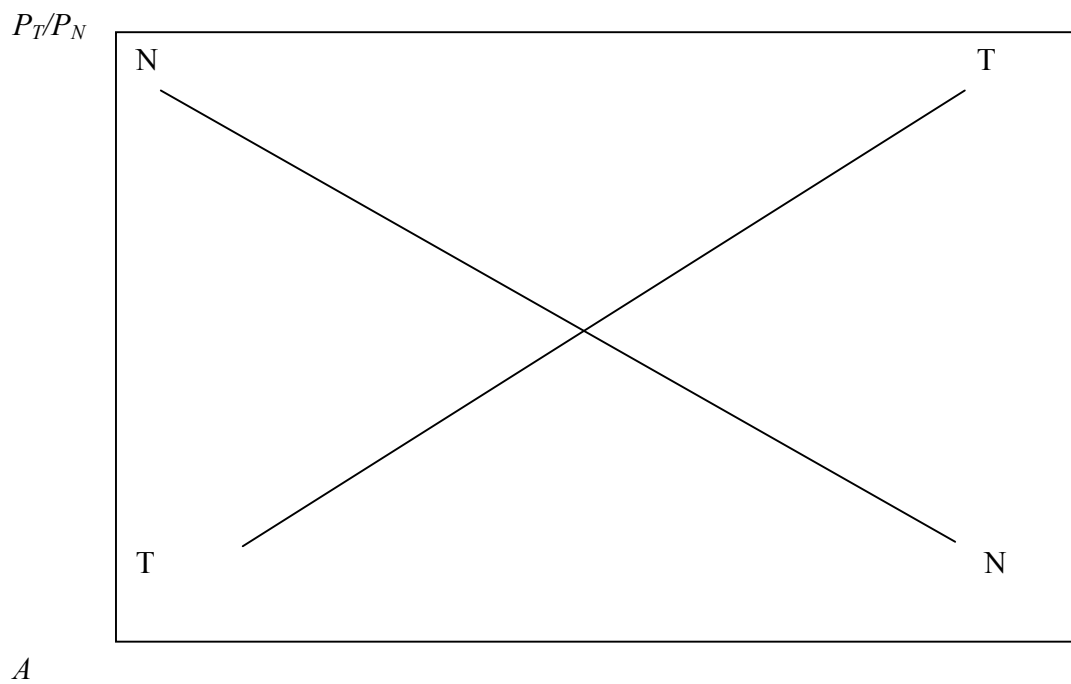


Figure 8. Long-run equilibrium in Salter-Swan

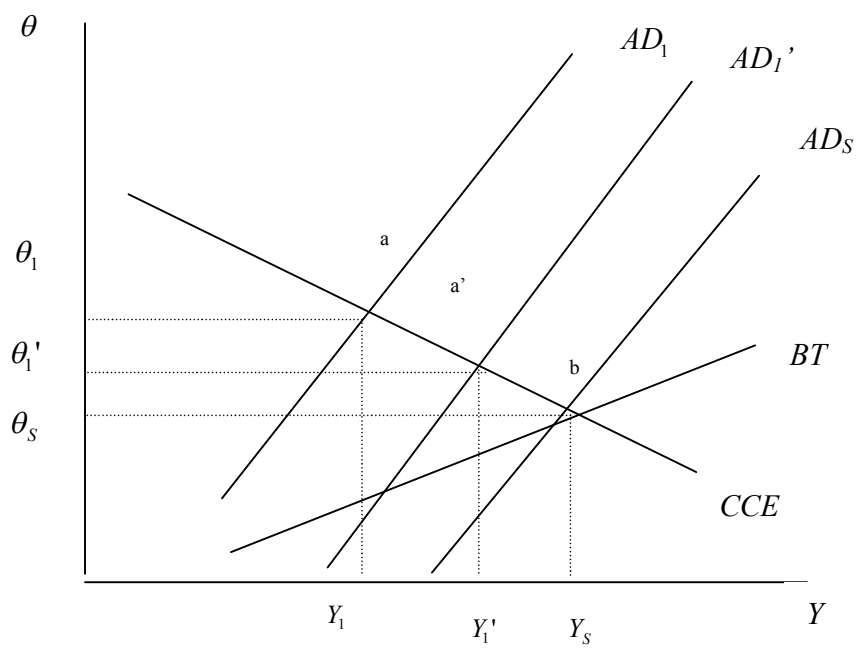
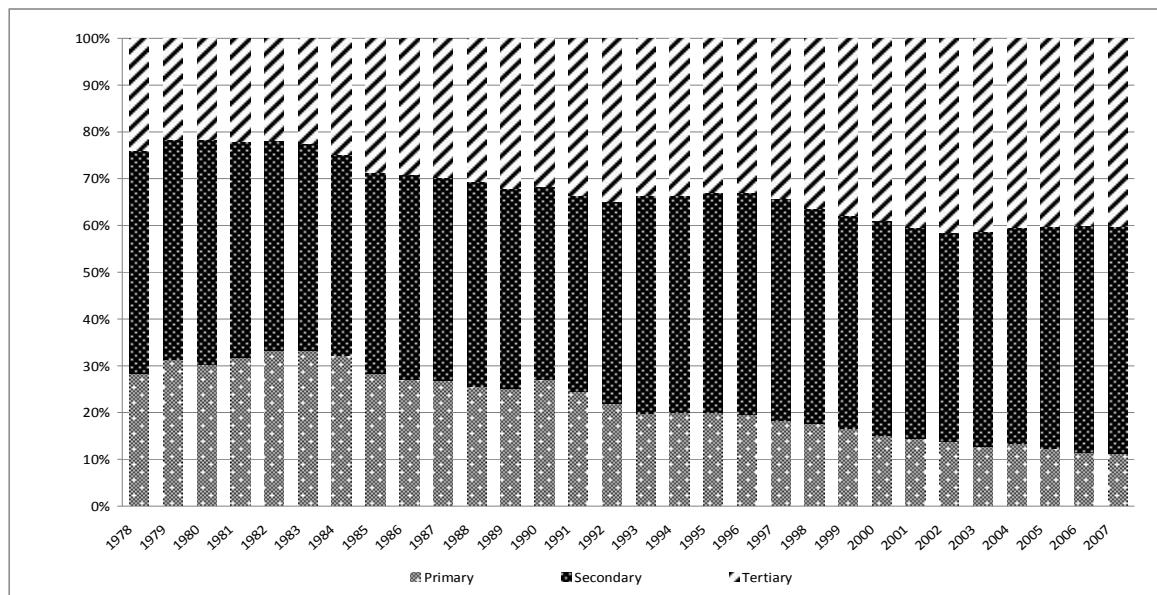
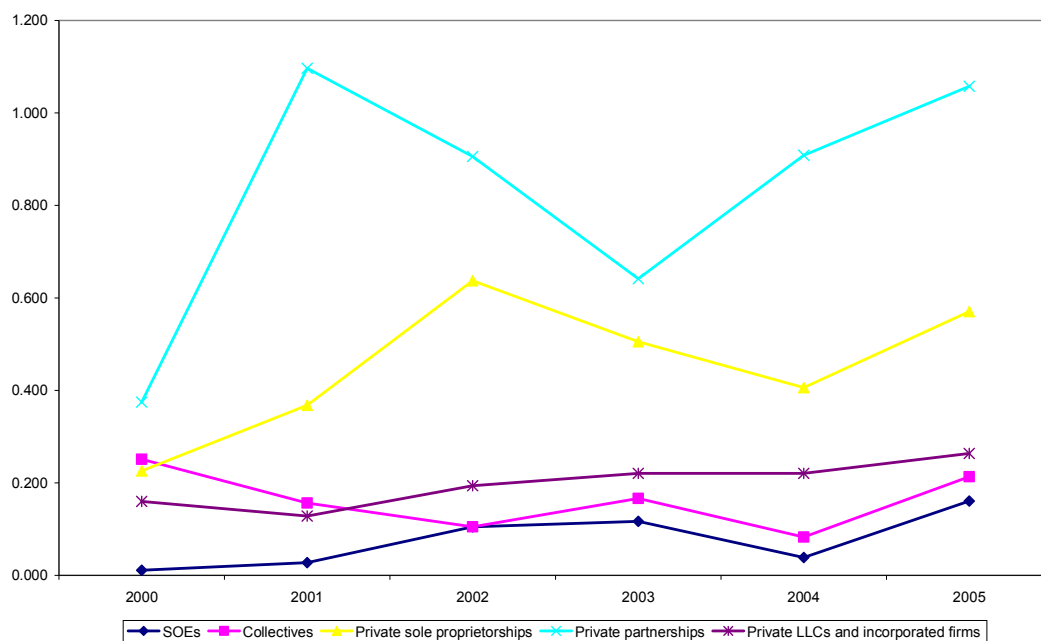


Figure 9. China's GDP by sector



Source: China Statistical Yearbook.

Figure 10. Return on assets for Chinese firms



Source: National Bureau of Statistics, various years, and author's calculations.