Combating the Global Financial Crisis with Aggressive Expansionary Monetary Policy: Same Medicine, Different Outcomes in China, UK and USA

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Abstract

In 2008-2009, the US and the UK undertook quantitative easing to drive interest rates to near zero to combat the Global Financial Crisis, and China increased the growth rate of base money slightly. The resulting credit growth was very slight in US and UK but over 100% in China. The US and UK money multipliers collapsed because the required capital adequacy ratio (CAR) was binding for many of their banks. Specifically, the value of the money multiplier is zero when CAR is not met; is one when CAR is binding and when the asset purchased by the central bank requires the commercial bank to hold capital against it; and equals the reciprocal of the required reserve ratio when CAR is not binding. To improve China's economic performance, we propose three new growth drivers to replace the present instruments of macro-stimulus: changes in rural economic institutions to create new entrepreneurs, an urbanization strategy based on the principle of future home ownership, and modernization of the financial system.

Key Words: Global financial crisis, quantitative easing, capital adequacy ratio, principle of future home ownership, balance-sheet repair, demand-replacement therapy

JEL code: E44, E51, E65, F41, G21, O53, P31

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1. The Recent Puzzle in Money-Income Nexus

The countdown to the Global Financial Crisis (GFC) could be said to have started on 22 June 2007 when the American investment bank, Bear Stearns, bailed out two of its subprime mortgage hedge funds, High-Grade Structured Credit Fund and High-Grade Structured Credit Enhanced Leverage Fund. The slowdown of the US economy that started in late 2007 hastened the unraveling process of the financial sector. The share price of Bear Stearns slide from $172 on 12 January 2007 to $62 on 11 March 2008 and to $30 on 14 March 2008. Bear Stearns was finally acquired by JP Morgan on 29 March 2008 at $10 a share[1] in a deal that was subsidized by the Federal Reserve Bank of New York in the form of a guarantee on the value of a portion of the acquired assets.

When Lehman Brothers, another investment bank, filed for bankruptcy on 15 September 2008, it sparked a wholesale flight to liquidity that caused a meltdown of financial markets globally. This widening financial crash, in turn, became a negative feedback loop to the level of aggregate income. GDP growth (year-on-year, y-o-y) turned negatively in 2008:4Q in the United States (-1.9%) and the United Kingdom (-2.1%), see Figure 1.[2]

[1] Bear Stearns had agreed to a sale price of $2 a share on 16 March 2008, but after threats of law suits by irate shareholders of Bear Stearns, JP Morgan raised the price to $10 a share.

[2] Unless otherwise specified, we report all growth rates on y-o-y basis. If annualized quarter-to-quarter (q-o-q) GDP growth rates were used, negative growth came in 2008:3Q for the US (-2.7%) and in 2008:2Q for the UK (-0.3%).

This abrupt decline in the GDP of the major advanced economies translated into a large abrupt negative external shock to China that had two components: a negative export shock, and a negative inward foreign direct investment (FDI) shock, see Figure 2. China's exports fell from a peak of $137 billion in 2008:7M to $117 billion in 2008:12M and then to $65 billion in 2009:2M, see Figure 2. On a y-o-y basis, the growth rate of exports turned abruptly[3] negative (-2.2%) in 2008:11M, and remained negative through 2009:11M. The growth rate of FDI also turned abruptly negative in 2008:11M to -36% from +35% in 2008:10M; remained negative through 2009:7M; and recovered to historically low levels in 2009:8M to 2010:4M.[4]

This prolonged contractionary external impulse hit China at a time when its economy was already slowing down from the tightening of monetary policy that was implemented immediately after the conclusion of the 17th Congress of the Communist Party of China on 21 October 2007. In the run-up to the Party Congress, easy monetary policy had steadily boosted GDP growth from 10.4% in 2005 to 11.6% in 2006 and 13% in 2007.[5] GDP growth, which had been brought down by tighter monetary policy to 10.4% in 2008:2Q, fell to 9.6% in 2008:4Q and then further to 6.1% in 2009:1Q under the additional squeeze from the large drop-off in export and foreign investment.[6]

[3] The y-o-y growth rate of export was high in the preceding four months: 27% in 2008:7M, 21% in 2008:8M, 22% in 2009:9M, and 19% in 2008:10M, which were the typical export growth rates until 2008:11M.

[4] This drop in FDI was also large and protracted. The average growth rate of FDI was 14% for 2007, 42% for 2008:1M to 2008:10M, and -20% for 2008:11M to 2009:7M. Except for the strange upward spike in 2009:12M as in 2008:1M, the FDI growth in 2009:8M to 2010:4 was below pre-crisis norm.

[5] A number of China-watchers, e.g. Prasad (2008), have attributed the high credit growth in the 2005-2007 period to China's loss of control over monetary aggregates caused by its massive intervention in the foreign exchange market to prevent the Renminbi (RMB) from rising too fast against the US dollar. We reject this loss-of-control interpretation because the People's Bank of China (PBC) imposes a credit quota on every bank, and this institutional feature makes unintentional loss of control over credit impossible. PBC did not have trouble limiting credit growth in the first half of 2008, despite its continued heavy foreign exchange market intervention, after it announced that banks should henceforth observe the credit quotas that they were assigned.

[6] The Hong Kong office of Goldman-Sachs, in private communication to the author, reported that the GDP growth rate on q-o-q basis was 10.1% in 2008:1Q, 9.8% in 2008:2Q, 6.0% in 2008:3Q, 2.2% in 2008:4Q and 6.6% in 2009:1Q.

On the eve of the first G-20 leaders' summit in November 2008 in Virginia, USA, Prime Minister Wen Jiabao predicted that China's growth rate in 2009 would be 8%[7], and he unveiled a two-year 4 trillion Renminbi (RMB) investment program that was about 7% of GDP in each year. Premier Wen reiterated his prediction of 8% growth when the IMF lowered its 2009 growth forecast for China to 6.7% in January 2009, and when the IMF lowered the growth forecast again to 6.5% in April 2009. The World Bank had predicted 6.5% growth earlier in March 2009. This pessimistic assessment by the IMF and the World Bank (along with quite a number of other experts[8]) was shaped by the clear deepening decline of GDP in the advanced economies in 2009. Figure 1 shows that US GDP had (almost) zero growth in 2008:3Q, negative growth in the succeeding four quarters, and (almost) zero growth in 2009:4Q; and UK GDP growth rate (which was 2.4% in 2007:4Q and 2008:1Q) was 0.2% in 2008:3Q and negative throughout 2008:4Q to 2009:4Q.

Things turned out very differently for China. Its GDP grew 8.7% in 2009, surpassing even Premier Wen's "optimistic" prediction of 8%. The very different outcomes in these three countries are quite unexpected because they occur against the background of very similar monetary policy actions undertaken by the Federal Reserve, the Bank of England and the People's Bank of China (PBC). When we compare the average growth rate of the monetary base (M0) in these countries in the last five periods of our period sample, 2008:4Q to 2009:4Q, to the average M0 growth rate in the preceding five periods, 2007:3Q to 2008:3Q, we find 79.7% versus 8.5% for the US, 94.6% versus 17.7% for the UK, and 12.6% versus 11.6% for China – see Figure 3. It seems a puzzle that the markedly more aggressive monetary expansion by the US and the UK was not able to prevent negative GDP growth in 2009. Was the ineffectiveness

[7] Many analysts interpret the 8% prediction to mean "at least 8% growth in 2009" because China had always exceeded its government-set growth target since 1978.
[8] See, for example, Rogoff (2009)

of monetary policy in US and UK more the result of the particular initial structural conditions in these economies or more the result of still inadequate expansion of the monetary base? Our answer is that it was the former.

This paper has two goals. The first goal, which is the primary goal, is to explain why the expansionary monetary policies in USA, UK and China led to the very different outcome in output performance. I will show that the nature of the M0-GDP nexus depends on the condition of the balance sheet of the financial sector before large-scale open-market operations were undertaken to increase M0. The large jump in M0 in US and UK could not stimulate GDP because the capital adequacy ratio (CAR) requirement prevented the normal working of the credit creation process propelled by the required reserves ratio being less than unity. Our identification of the CAR being a constraint on the effectiveness of monetary stimulus is of interest because this point is not discussed in many widely-used intermediate-level textbooks published before 2008[9] even though they all mentioned the importance of monetary factors in the Great Depression of the 1930s. These textbooks focus on the required reserve ratio (RRR) and the currency-deposit ratio (CDR) to as determinants of the size of the money multiplier. Since the RRR is now used less and less in the advanced economies as an instrument to control the growth of credit, it is time to update the usual discussion on money multiplier by including the role of CAR. In short, our first contribution in this paper is to bring attention to the point that the ability of the central bank to impart monetary stimulus depends on the initial conditions in the financial system in a way that is often overlooked.

The second, and secondary, goal of this goal is to argue that China should now replace its present tools of macro-stimulation with new growth drivers because the present macro-stimulus

[9] For example, Blanchard (2006), Mankiw (2007) and Williamson (2005). We checked 10 intermediate macroeconomic textbooks published before 2008 and none of them mention the CAR requirement.

tools will cause inflation in the medium-run and weaken the growth fundamentals in the long-run. Our second contribution in this paper is to outline a list of new growth drivers that will sustain China's high growth by hastening its convergence to a modern market economy and promoting higher growth in the less developed regions.

The paper is organized as follows. Section 2 spells out the links between the monetary base and the size of the liquidity stimulus. Section 3 shows how subprime mortgage crisis removes the ability of open market purchases of government securities to provide liquidity stimulus. Section 4 matches the discussion in Section 3 with the growth of credit in US, UK and China during the GFC. Section 5 concludes the paper by discussing why China must replace its present macro-stimulus instruments with new ones to avoid problems from the medium-run onward.

2. The Linkages in the M0-GDP Nexus

We first depict the banking system in a simple way by using the following assumptions:

1. The commercial banking system consists of two banks, Bank A and Bank B.
2. Any commercial loan extended by Bank A will be deposited by the borrower in Bank B; and vice versa.[10]
3. Both Bank A and Bank B engage only in transactions denominated in domestic currency
4. The loan portfolio of Bank A consists of government securities and commercial loans, and that of Bank B consists entirely of commercial loans. Commercial loans include securities backed by subprime mortgages.

[10] This assumption permits the full working out of the money multiplier process explicated in intermediate-level macroeconomics textbook.)

5. Legally required ratios: required reserve ratio is 10% (applies to deposits), and required CAR is 10 % (applies to sum of government securities and commercial loans)
6. Initial size of assets and liabilities (in $millions)
    a. for Bank A: deposits = 100, capital = 13, required reserves = 10, excess reserves = 0, government securities = 20, commercial loans = 83
    b. for Bank B: deposits = 100, capital = 13, required reserves = 10, excess reserves = 0, commercial loans = 103

The balance sheets of the commercial banking system and its two component banks resulting from the above assumptions are displayed in Table 1. We will use the term "traditional open market purchase" to refer to the central bank buying government securities from the commercial banks, and the term "non-traditional open market purchase" to refer to the central bank buying commercial loans from the commercial banks.

We now show in Table 2 the usual macroeconomic textbook of the working of the money multiplier process after the central bank conducts a traditional open-market purchase of $5 million worth of government securities (from Bank A in our case). Part I of Table 2 shows the balance sheets immediately after the open-market operations: Bank A's stock of government securities is reduced by $5 million while its excess reserves rise by the same amount. Part II shows the first round of the credit creation process: Bank A eliminates its excess reserves by making a new commercial loan of $5 million, which, after deposit in Bank B, allows Bank B to make a new commercial loan of $4.5 million. Part III shows the balance sheet of the banking system upon the completion of the credit-creation process: the additional amount of credit created is $50 million to yield a value of 10 for the credit multiplier.[11]

[11] Which is the well-known result of the money multiplier being the reciprocal of the required reserve ratio, 0.1

Section 3: The Impact of the Subprime Mortgage Crisis on the Credit-Multiplier

We are now ready to consider the case of a $6 million write-off of subprime mortgage loss by each bank. Part I of Table 3 shows the immediate consequences on the balance sheets: the value of Bank A's capital is now $7 million, and the value of its total loan portfolio is $97 -- yielding a capital-asset ratio of 7%. Unless Bank A and Bank B are able (and willing) to raise more capital, they would have to recall loans or sell them at discount in order to meet the legal CAR of 10%. This economy-wide shedding of loans is likely to ignite a downward spiral for aggregate output: stoppages of production from the non-availability of trade credit would lead to bankruptcies and even lower asset prices, which would require to more write-off of bank capital, necessitating additional shedding of loans.

In the case of generalized violation of CAR by banks, and where the extreme uncertainty about the soundness of the banks is discouraging their recapitalization by private investors, the central bank could try to stabilize the financial markets by a combination of recapitalizing the banks with public money (i.e. nationalization of the banking industry), reducing the required CAR (e.g. by ignoring the violations of the CAR), and accommodating the banks' need for liquidity by buying commercial loans from the banks. By not limiting its purchase of assets to government-issued securities, the central bank is hence engaging in non-traditional open-market operations.

Part II of Table 3 reports the case where the central bank buys $20 million of government securities and $7 million of commercial loans from Bank A and $27 million of government loans from Bank B to allow their reduced capital to fulfill the CAR requirement. Bank A and Bank B now holds excess reserves of $27 million each, and the central bank is now holding $34 million of commercial loans. In this new equilibrium, the aggregate value of commercial loans is $174

million which is below the pre-crisis level of $186 million (by the amount of the $12 million subprime mortgage loss) despite the large[12] injection of $54 million of bank reserves by the central bank.

The lesson from Table 3 is that when the banking system in violation of the CAR requirement, the value of the money multiplier is 0. The expansion of the monetary base does not stimulate production because the reduced capital position of the banks forces them to hold the new funds as excess reserves and not push them out as new loans.

Table 4 reveals an interesting about the consequences of additional non-traditional open-market operations to boost the economy after the earlier dose has enabled the banks to fulfill the CAR requirement. Similar to the textbook case depicted in Table 2, the central bank buys $5 million of commercial loans from Bank A as shown in Part I of Table 4. This open-market operation relaxes the CAR constraint and allows Bank A to create $5 million in new loans, which then makes the CAR constraint binding on Bank A again. The deposit of this new loan in Bank B makes it hold $0.5 million more in required reserves but does not cause it to make a new loan of $4.5 million because it is already extending the maximum amount of loans ($70 million) allowed by its capital base of $7 million. So the $5 million increase in bank reserves (monetary base, M0) augments the amount of commercial loans by $5 million, i.e. the value of the money multiplier is 1 when the CAR requirement is binding on the banking system.

There is, however, a fundamental qualification to the preceding conclusion from Table 4. Its validity depends on more than CAR being binding, it also depends on the condition that the financial asset purchased by the central bank must be one that the commercial bank has to hold capital against. In our Table 4 example, CAR applied to government securities but in many major countries, CAR does not apply to government-issued obligations. In this important class

[12] The adjective "large" is appropriate because the original amount of bank reserves is only $20 million.

of countries, open-market purchases of government securities when CAR is binding will not increase bank lending to the private sector. For these countries, the central bank must purchase commercial papers in order to avoid a zero-value money multiplier. This non-traditional mode of open-market purchase is a practice that citizens should rightly worry about because the next step down this slippery slope is for the government to print money and purchase private equities.

4. Matching Theory and Data: United States, United Kingdom and China

Figure 4 reports the growth rates of broad money (M2), a common proxy for commercial credit, in the 2002-2009 period. The movements of M2 in 2008-2009 stand in sharp contrast with the movements in M0 in Figure 3:

1. the growth rates of M2 in US and UK in 2008 and 2009 were significantly below their historical norms while the growth rates of their M0 were very substantially above their historical norms; and
2. the very moderate increase in M0 growth in China unleashed a much above historical norm increase in M2 growth.

This contrast in the movements in the two monetary aggregates reflects a prolonged collapse in the money multipliers (M2/M0 ratios) in US and UK in 2008 and 2009, and a protracted moderate increase in the money multiplier in China. The value of the money multiplier in 2007:4Q and 2009:4Q were, respectively, 14.2 and 6.4 in the US; 30.3 and 12.7 in the UK; and 13.3 and 15.9 in China – see Figure 5.

Combining the theoretical discussions in Sections 2 and 3 with our knowledge that many big financial institutions failed in the US and UK during the Global Financial Crisis, my explanation for the behavior of the US and UK money multipliers is that the capital positions of

the US and UK financial institutions were so damaged by the collapse of the real estate bubble that many of them failed to meet the CAR requirement for a while and were then afterwards often constrained by the CAR requirement. The aggressive expansion of the monetary base by the Federal Reserve and the Bank of England could only accommodate the need of the US and UK banks to adjust their asset composition from commercial loans to cash in order to be in line with the reduced size of their capital base, and could not induce them to increase lending to the private sector.

In China in 2008-2009, on the other hand, no financial institutions failed like in the US and UK. The major negative shock to China was not a big reduction in working capital but a significant cut in exports and FDI inflow. As PBC was still engaged in cooling down the economy after the Party Congress held in October 2007, the Chinese banks faced binding credit quotas in 2008:2Q not binding CAR. With the Chinese commercial banks holding substantial excess reserves when the credit quotas were removed and the required reserve ratios lowered at the end of 2008:3Q, M2 grew 28% despite M0 growing only 12%. Banks made 9.6 trillion RMB in new loans in 2009 compared to 4.0 trillion RMB in new loans in 2008.[13]

To summarise, the expansion of the monetary base in the US and the UK repaired the balance sheets of the commercial banks, while the expansion of the monetary base in China replaced export demand and externally-financed investment demand with internally-generated demand. These two different accomplishments reflected the different initial balance-sheet conditions in the financial sectors of these three countries before their central banks stomped on their monetary accelerators to fight the Global Financial Crisis.

[13] "Chinese regulator raises concerns about local lending," *Financial Times*, April 11, 2010. The target amount of new loans in 2010 is 7.5 trillion RMB.

5. Concluding Remarks

A large increase in base money for balance-sheet repair will have different implications for the inflation outlook as the same increase in base money for demand-replacement therapy. As the former accommodates a portfolio shift towards liquid assets, it is less likely to be inflationary. This means that despite the absence of any signs of inflation from the quantitative easing (near-zero interest rate policy) enacted in US and UK, China should not be complacent about inflation.[14] This point appears confirmed by the Chinese economic situation in May 2010. CPI inflation in 2009 was reassuringly low at -0.7% but the "land prices ... doubled in 2009 on a nationwide basis."[15] The value of residential property transactions in 2009 was 80 percent higher than in 2008.[16] This large jump in real estate prices is doubtedly, at least partly, a consequence of the 28% increase in M2 in 2009.

The first quarter of 2010 saw even more rapid increases in land prices, especially in the major coastal cities.[17] As a real estate bubble is inevitably socially-alienating (by disappointing new home buyers on the way up and dismaying existing home owners on the way down), the government sought to stabilize property prices in mid-April 2010 by[18] (a) requiring first-time home buyers to put a minimum of 30% down payment for houses larger than 90 square meters; (b) raising the down payment for second homes from 40% to 50%; (c) increasing the mortgage rate on second homes; (d) banning (temporarily) mortgage applications for purchases of third (or

[14] We had emphasized this point at the *The Global Financial Crisis* conference of Nottingham University in Ningbo, China, on November 10, 2009.
[15] "China Tells Banks to Restrict Loans to Local Governments," *The New York Times*, February 25, 2010.
[16] "Market Defies Fear of Real Estate Bubble in China," *The New York Times*, March 4, 2010. It also reports that some duplexes in Shanghai were selling at US$45 million each .
[17] In 2009, land prices had gone up 200% in Shanghai, 400% in Guangzhou, and 876% in Wenzhou; "China: No one home," *Financial Times*, February 21, 2010.
[18] "Second home payment raised to curb soaring prices." *China Daily*, April 15, 2010; and "Shanghai property curbs soon," *China Daily*, May 13, 2010.

more) homes; and (e) banning (temporarily) mortgage applications by non-residents[19] for purchases of homes. Beijing imposed additional restrictions on property transactions housing on April 30, 2010, and Shenzhen and Shanghai have announced that they intend to do the same soon.[20]

To us, the roaring real estate market and the use of non-market means (e.g. ban on purchases) to tame it are symptoms of some deep economic problems that China has to address in order to sustain growth over the long-run. Specifically, the real estate boom is part of a generalized investment boom unleashed by the 400 trillion RMB stimulus program implemented since November 2008. The fact that the central government would fund only one-third of the proposed expenditure might prompt one to think of the stimulus program as a work agenda for the government to create the incentives to induce investment to reach the stated level, but such an interpretation would be wrong. The stimulus should be properly understood as permission by the central government to allow additional investments up to the stated level.

This different understanding is based on the reality that a large part of China's economy is still state-controlled[21], and that this segment pursues other objectives besides the ideal of profit-maximization. Because state-controlled enterprises (SCEs) are usually bailed out when investment decisions turned out to be over-optimistic or derailed by bad luck, this soft-budget practice has created the well-know interest-inelastic phenomenon of "thirst for investment" which makes the economy inflation-prone; see Woo (2006). An expanded SCE yields its state-appointed manager three major benefits: higher likelihood of promotion based on the proven

[19] The Household Registration System in China defines the legal residence status for every citizen (e.g. rural versus urban, city A versus city B).
[20] "Shanghai property curbs soon," *China Daily*, May 13, 2010. Naturally, the citizenry has responded to the higher costs of buying second homes in creative ways, including temporary divorces, "Divorce, a way round China's second-home restrictions," *China Daily*, May 13, 2010.
[21] State-controlled firms include state-owned firms and publicly-listed firms where the state and its intermediaries hold the controlling share.

ability to handle bigger things, greater patronage power to build a political base; and more resources that could potentially be diverted for personal gains.[22] Equally important is that the leaders of the local governments share the enthusiasm of SCE managers for growth for the same three reasons.

The central government has two lines of defense to maintain macro-stability in China's partially-reformed economy. The first line is that all large projects need the approval of the National Development and Reform Commission (formerly, the State Planning Commission). The second line of defense is that all banks are assigned credit quotas.

So when Premier Wen Jiabao approved the stimulus program and covered only a third of its cost, he was giving permission, one, to the SCEs to invest more in order to offset the spending slump in the private sector; and, two, to the state-controlled banks (SCBs) to extend the necessary loans to fund the approved projects. Herein lies the mechanism for the success of the stimulus program: the use of non-profit-maximizing state-controlled production and financial units to boost aggregate demand. Because the SCEs and the SCBs are implementing a state-assigned mission, their managers cannot rightly be held responsible should the assigned projects turn out to be financial busts in the future.

Not surprisingly, the public media carries occasional anecdotes about new investments in industries plagued by overcapacity (e.g. steel, cement, and aluminum); trophy investments (e.g. grand town centers, high-speed rail and stately administrative buildings); and spontaneous privatization of project funds (e.g. massive purchase of cars by state bodies).[23] Many of these

[22] "China Finds Huge Fraud by Officials," *The New York Times*, December 30, 2009.
[23] See, for example, Forsythe (2009), "China: No one home," *Financial Times*, February 21, 2010; "China audit finds misuse of funds tied to stimulus," *Financial Chronicle*, Dec 29 2009, http://www.mydigitalfc.com/news/china-audit-finds-misuse-funds-tied-stimulus-821; and "China boosts auditors' power as stimulus package spending prompts corruption concerns," *People's Daily*, February 21, 2010, http://english.peopledaily.com.cn/90001/90776/90785/6898354.html

industrial and infrastructure investments are undertaken by the 8,000 local investment companies established by the local governments. It has been estimated that at the end of 2009, the loans of these investment vehicles amounted to 51% of GDP in 2009 and the debt of the central government amounted to 20% of GDP.[24] There is thus concern in some quarters that much of the bank loans to the stimulus program would end up as nonperforming loans (NPLs), and that the resulting financial crisis would cause China to crash much like the way US and UK did in 2009.[25] Or alternatively, the bailout of the SCBs by the government would cause a fiscal crisis that would require large cutbacks on important infrastructure and social programs.

A second common concern about China's stimulus program is that the SCBs were channeling the flood of liquidity to the SCEs and neglecting the increased financing needs of the private sector brought on by the GFC. Pressed for working capital, two well-known large private companies, Rizhao (a steel firm) and Mengniu (a diary), agreed to be acquired by their state-owned counterparts. As SCEs are generally less efficient and innovative than private firms, the expansion of the role of the state firms has rightly raised the issue of whether Premier Wen's way of imparting the needed boost to capacity utilization during the GFC would become a drag on future productivity growth.[26]

In our opinion, the discussion on China's stimulus program should now turn from the deleterious consequences of the continued administration of Premier Wen's emergency-room medicine to what his post-operative medication should be. We would therefore like to end this paper by proposing three new inter-related growth drivers that would minimize the tradeoff

[24] The 51% figure is from combining information in Shih (2010) who reported the debt of the central government to be 20% of GDP, the information in the *Financial Times* ("China warned of growing 'land loan' threat," March 28, 2010) that the combined figure was 71%.
[25] For example, "China is heading for a Japan-style bubble," *Financial Times*, November 2, 2009; and "Contrarian Investor Sees Economic Crash in China," *The New York Times*, January 8, 2010.
[26] "Communist Party Needs to Loosen Its Grip on China," *The New York Times*, March 2, 2010. This debate over the growth of the state firms at the expense of private ones is conducted over the heading of *guojin mintui* (the state sector advances, and the private sector withdraws).

between full utilization of existing production capacity and viable long-term growth of production capacity, and they are (1) creation of more new private entrepreneurs; (2) urbanisation according to the principle of future home ownership; and (3) development of a modern financial system where the private sector has a greatly enhanced role.

The state can partly offset the expanded state sector by mobilising the inland migrant workers (*nongmin gong*) laid-off from the coastal provinces into an entrepreneurial force. Many of the *nongmin gong* have sufficient work experience to start their own factory-workshops to take advantage of the increased cost competitiveness of the inland provinces created by the explosive extension of the national transportation network during the GFC. Because the primary barrier to the emergence of this group of owner-operators is the availability of credit, the government should legalize small and medium private banks as they have comparative advantage over the four large state banks in catering to the needs of these new entrepreneurs.[27] Farmland should also be privatized so that the new businesses can have the collateral to access credit from the new private banks. The creation of a new large group of private entrepreneurs will bring three major benefits (1) expenditure by this new group will substitute for the present macro-stimulus program in keeping aggregate demand high; (2) private firms are likely to have higher productivity growth than SCEs; and (3) these small and medium private enterprises will be more labour-intensive than SCEs.

The second new growth driver would be urbanization based on the principle of affordable future home ownership. The fast growth of the real estate sector, not only recently but also over the last decade, reflected not just speculative demand but also genuine pent-up demand for housing and genuine accommodation of the high rate of the joint industrialization-

[27] The system of prudential supervision must also be strengthened, and interest rate be deregulated.

urbanization process.[28] The bulk of the new arrivals from the countryside cannot qualify for bank mortgages, and so many investors have been buying multiple housing units to rent to the new arrivals with the intention of raising the rents over time in line with the income growth of the renters. In this sense, much of the recent housing demand has been speculative.

We propose that China studies the low-cost public housing schemes in Hong Kong and Singapore and establishes a national housing program where the new arrivals would rent homes for seven years and then have the first right to buy these units at a price based on construction costs. This "future ownership" form of urbanization would prevent the problem of empty housing held for speculative reasons from escalating into NPLs. China can afford a massive public housing program because the expensive part of such programs in other countries is the cost of land and not the cost of the structures, and land in China is mostly owned by the state.[29]

Our proposed form of urbanisation will support China's growth in three ways (1) the maintenance of real estate investment to supply the needed housing and to help maintain existing level of aggregate demand; (2) the redirection of bank loans to new rural migrants, with the new housing agency as the intermediary, to prevent the appearance of NPLs; and (3) this housing scheme will redistribute income to the rural migrants (which helps in reducing the threat of software failure), with the positive side effect that consumption would rise to help offset the elimination of the macro-stimulus program. The main institutional adjustments that must be made to enable the working of this second new growth driver are the same that would help the

[28] If speculative demand had been the overwhelmingly dominant cause for the property boom, then house rents would not have risen substantially (because the speculative investors would tend to rent out their extra units). Instead, rent in Beijing in March 2010 was 19.6% above March 2009; see "Survey shows house prices still too high," *China Daily*, May 12, 2010: http://www.chinadaily.com.cn/metro/2010-05/12/content_9839054.htm

[29] It should be noted that housing construction is relatively labor-intensive, and that home decoration is highly labor-intensive.

development of the first new growth driver: privatization of farmland, termination of the household registration system, and liberalization of the financial system.

The legalization of private banks is not just lubricant to allow the smooth working of the first two new growth drivers, it is also an independent growth driver in its own right. The GFC has greatly increased attention on the chronic imbalances in global trade and incited strident justifications for US protectionism against China's "beggar-thy-neighbour" policies.[30] The prevention of foreign protectionism through financial sector modernization is our third new growth driver for China.[31]

Because China's trade account surplus is largely caused by the difference between its savings and investments[32], it has become fashionable to call for China to adopt consumption-led growth by reducing savings and by reducing investments.[33] We note, however, that (1) this adjustment recipe of a lower investment rate is actually a call for China to grow slower and delay its economic catch-up with the advanced economies; (2) what is truly economically unnatural, is for China to have been putting its savings abroad when the rate of return on domestic investment is so much higher than the rate of return on US Treasury securities; and (3) China's "over-

[30] See, for example, Krugman (2010a and 2010b); Wolf (2010); " Currency Dispute Likely to Fray US-China Ties," *The New York Times*, February 4, 2010; and the hard-hitting editorial "Will China Listen?" *The New York Times*, March 17, 2010. See Woo (2008) for a detailed discussion on the causes of US-China trade tensions

[31] There are also, of course, the traditional ways that financial sector modernization would help drive economic growth. The emergence of a strong small-medium banking sector will reduce the dominance of the state-controlled banks and hence make the economy less vulnerable to their collapse from potential NPLs. The entry of private banks (domestic and foreign) will reduce the probability of any one of the big four state banks would remain too big to fail, and hence reduce the soft-budget protection enjoyed by the now monopoly state banking system. The privatisation of some units of the SCBs, and the emergence of large domestic private banks will also help in strengthening the budget constraints perceived by the managers of SCBs. The development of a modern banking system with a major role for the private sector will thence increase the quality of bank loans along with the increase in the quantity of bank loans – helping to reduce the appearance of NPLs along with market-directed investments replacing the macro-stimulus program.

[32] This is from the GNP identity where the current account balance is the sum of (nongovernmental savings – nongovernmental investments) and (government revenue – government expenditure).

[33] For example, Lardy (2007) wrote that the more desired growth path is one marked by "a reduction in China's national savings rate" (pp. 10), and by a reduction in "China's excessive rate of investment" (pp. 10). The latter "is a prerequisite to a successful transition to a more consumption-driven growth path" (pp. 10).

savings" could just as accurately be described as China's "under-investment." So, the true cause of China's chronic trade surpluses is the inability of China's financial system to intermediate all of domestic savings into domestic savings[34], and the best cure is to eliminate this dysfunctional aspect by modernizing the financial system by freeing up entry to private financial institutions, both foreign and domestic.[35]

We end by noting that the above three new growth drivers will not only obviate the employment-growth tradeoff of the present macro-stimulus but also improve the regional distribution of growth, create a more labor-intensive pattern of growth, forestall protectionism against China's exports, and raise investment (and, hence, growth).[36]

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[34] Liu and Woo (1994) shows formally and empirically that an underdeveloped financial system, ceteris paribus, raises the savings rate and hence increases the current account balance.

[35] Simultaneously, the management of state assets and the regulation of the financial sector should also be reformed to eliminate the phenomenon of repeated recapitalization of the SCBs. Also, see Woo (2008) for a package of short-run and long-run measures to reduce China's trade imbalances.

[36] For a broader analysis of the major barriers to China's continued high growth, see Woo (2007).

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Table 1: Balance Sheets of the Banking System and Its Component Banks (units: millions US$)

Bank A			
required reserves	10.0	deposits	100.0
excess reserves	0.0	bank capital	13.0
government bonds	20.0		
commercial loans	83.0		

Bank B			
required reserves	10.0	deposits	100.0
excess reserves	0.0	bank capital	13.0
government bonds	0.0		
commercial loans	103.0		

Commercial Banking System			
required reserves	20.0	deposits	200.0
excess reserves	0.0	bank capital	26.0
government bonds	20.0		
commercial loans	186.0		

Notes
1. Central Bank's holding of Commercial Loans = 0
2. Total amount of Commercial Loans outstanding = 186

Notes
See text for complete set of assumptions
required reserve ratio = 10%
capital adequacy ratio = 10%

Table 2: The Working of the Money Multiplier after an Open-Market Operations (OMO) that Added Reserves into the Commercial Banking System

Part I: Immediately After Open-Market Operations (OMO) to Purchase $5m of Government Securities: Excess Reserves Appear

Bank A				Bank B			
required reserves	10.0	deposits	100.0	required reserves	10.0	deposits	100.0
excess reserves	5.0	bank capital	13.0	excess reserves	0.0	bank capital	13.0
government bonds	15.0			government bonds	0.0		
commercial loans	83.0			commercial loans	103.0		

Commercial Banking System			
required reserves	20.0	deposits	200.0
excess reserves	5.0	bank capital	26.0
government bonds	15.0		
commercial loans	186.0		

Notes
1. Central Bank's holding of Commercial Loans = 0
2. Total amount of Commercial Loans outstanding = 186

Part II: First Round of Credit Creation After OMO: Elimination of Excess Reserves

Bank A				Bank B			
required reserves	10.0	deposits	100.0	required reserves	10.5	deposits	105.0
excess reserves	0.0	bank capital	13.0	excess reserves	0.0	bank capital	13.0
government bonds	15.0			government bonds	0.0		
commercial loans	88.0			commercial loans	107.5		

Commercial Banking System			
required reserves	20.5	deposits	205.0
excess reserves	0.0	bank capital	26.0
government bonds	15.0		
commercial loans	195.5		

Notes
1. Central Bank's holding of Commercial Loans = 0
2. Total amount of Commercial Loans outstanding = 195.5

Part III: Upon Completion of the Working of the Money Multiplier Process

Commercial Banking System			
required reserves	25.0	deposits	250.0
excess reserves	0.0	bank capital	26.0
government bonds	15.0		
commercial loans	236.0		

Notes
1. Central Bank's holding of Commercial Loans = 0
2. Total amount of Commercial Loans outstanding = 236

Table 3: Implosion of Subprime Mortgages, and Emergency Monetary Medicine

Part I: $6m loss each for Bank A and Bank B from Implosion of Subprime Mortgages: Violation of CAR requirement

Bank A				Bank B			
required reserves	10.0	deposits	100.0	required reserves	10.0	deposits	100.0
excess reserves	0.0	bank capital	7.0	excess reserves	0.0	bank capital	7.0
government bonds	20.0			government bonds	0.0		
commercial loans	77.0			commercial loans	97.0		

Commercial Banking System			
required reserves	20.0	deposits	200.0
excess reserves	0.0	bank capital	14.0
government bonds	20.0		
commercial loans	174.0		

Notes
1. Central Bank's holding of Commercial Loans = 0
2. Total amount of Commercial Loans outstanding = 174

Part II: After Non-Traditional Open-Market Operations to Purchase $20m of Government Securities and $7m of Commercial Loans from Bank A and $27m of Commercial Loans from Bank B: Excess Reserves Appear and Endure

Bank A				Bank B			
required reserves	10.0	deposits	100.0	required reserves	10.0	deposits	100.0
excess reserves	27.0	bank capital	7.0	excess reserves	27.0	bank capital	7.0
government bonds	0.0			government bonds	0.0		
commercial loans	70.0			commercial loans	70.0		

Commercial Banking System			
required reserves	20.0	deposits	200.0
excess reserves	54.0	bank capital	14.0
government bonds	0.0		
commercial loans	140.0		

Notes
1. Central Bank's holding of Commercial Loans = 34
2. Total amount of Commercial Loans outstanding = 174

Table 4: Consequences of Open-Market Operations when Balance-Sheet-Impaired Banks already Fulfill the CAR requirement

Part I: Immediate Impact of Follow-Up Non-Traditional Open Market Operations: Purchase $5m in Commercial Loans from from Bank A

Bank A			
required reserves	10.0	deposits	100.0
excess reserves	32.0	bank capital	7.0
government bonds	0.0		
commercial loans	65.0		

Bank B			
required reserves	10.0	deposits	100.0
excess reserves	27.0	bank capital	7.0
government bonds	0.0		
commercial loans	70.0		

Commercial Banking System			
required reserves	20.0	deposits	200.0
excess reserves	59.0	bank capital	14.0
government bonds	0.0		
commercial loans	135.0		

Notes
1. Central Bank's holding of Commercial Loans = 39
2. Total amount of Commercial Loans outstanding = 174

Part II: Upon Completion of the Working of the Money Multiplier Process

Bank A			
required reserves	10.0	deposits	100.0
excess reserves	27.0	bank capital	7.0
government bonds	0.0		
commercial loans	70.0		

Bank B			
required reserves	10.5	deposits	105.0
excess reserves	31.5	bank capital	7.0
government bonds	0.0		
commercial loans	70.0		

Commercial Banking System			
required reserves	20.5	deposits	205.0
excess reserves	58.5	bank capital	14.0
government bonds	0.0		
commercial loans	140.0		

Notes
1. Central Bank's holding of Commercial Loans = 39
2. Total amount of Commercial Loans outstanding = 179

Figure 1: GDP Growth Rates in China, United States and United Kingdom: 2002:4Q to 2009:4Q (%, yoy)

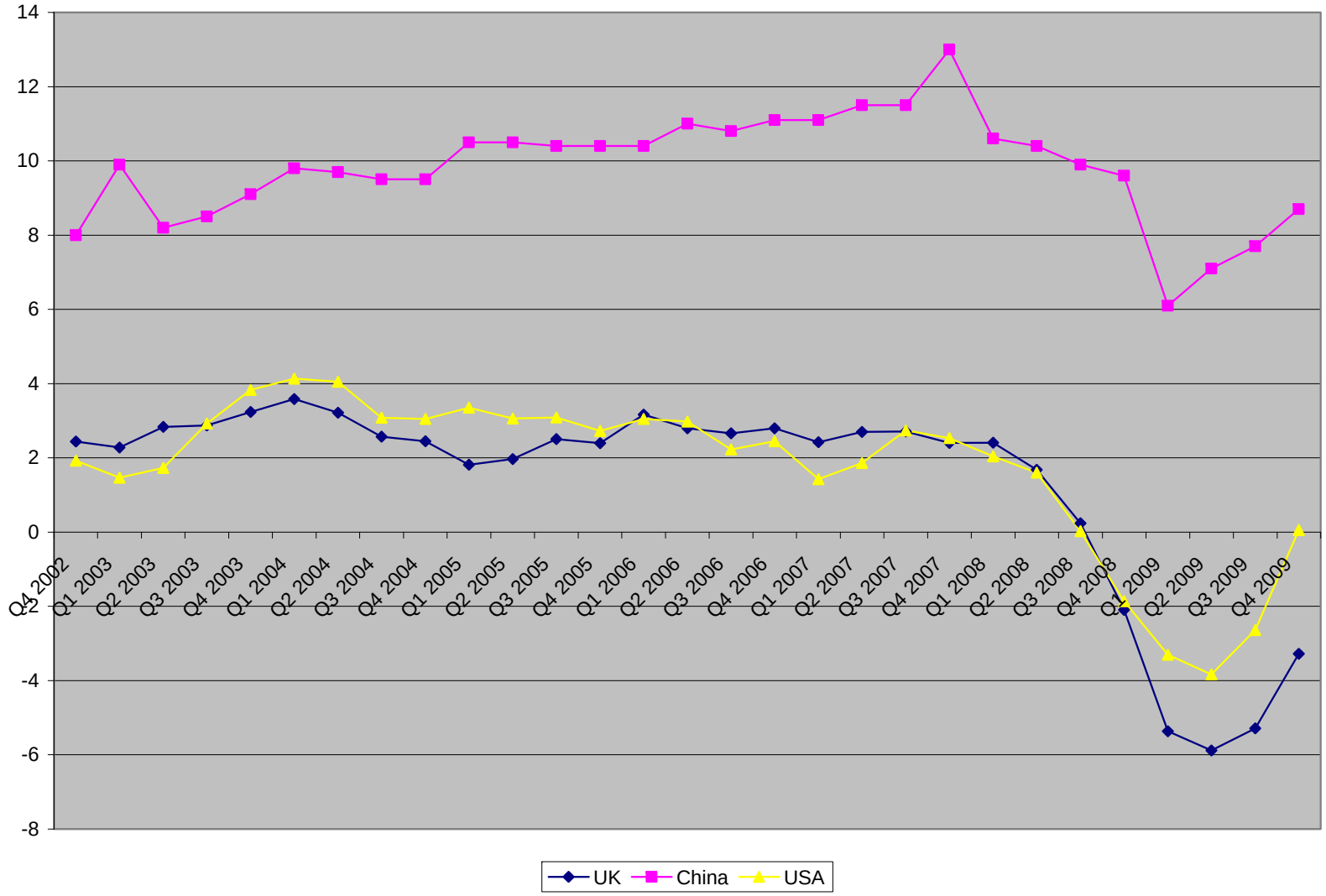


Figure 2: Twin External Shocks to China in 2008-2009: Decline in Exports and Foreign Direct Investment (%, y-o-y)

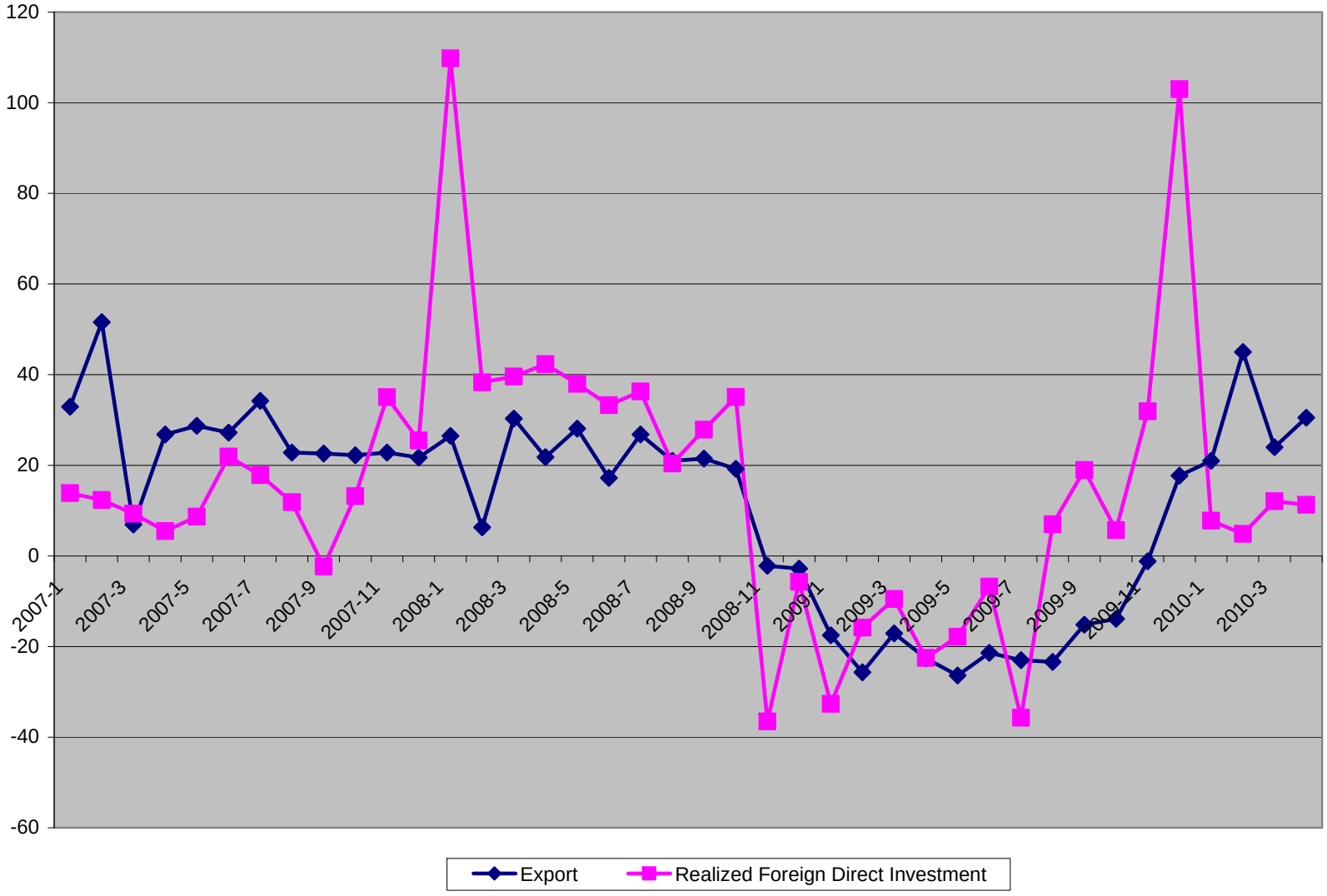
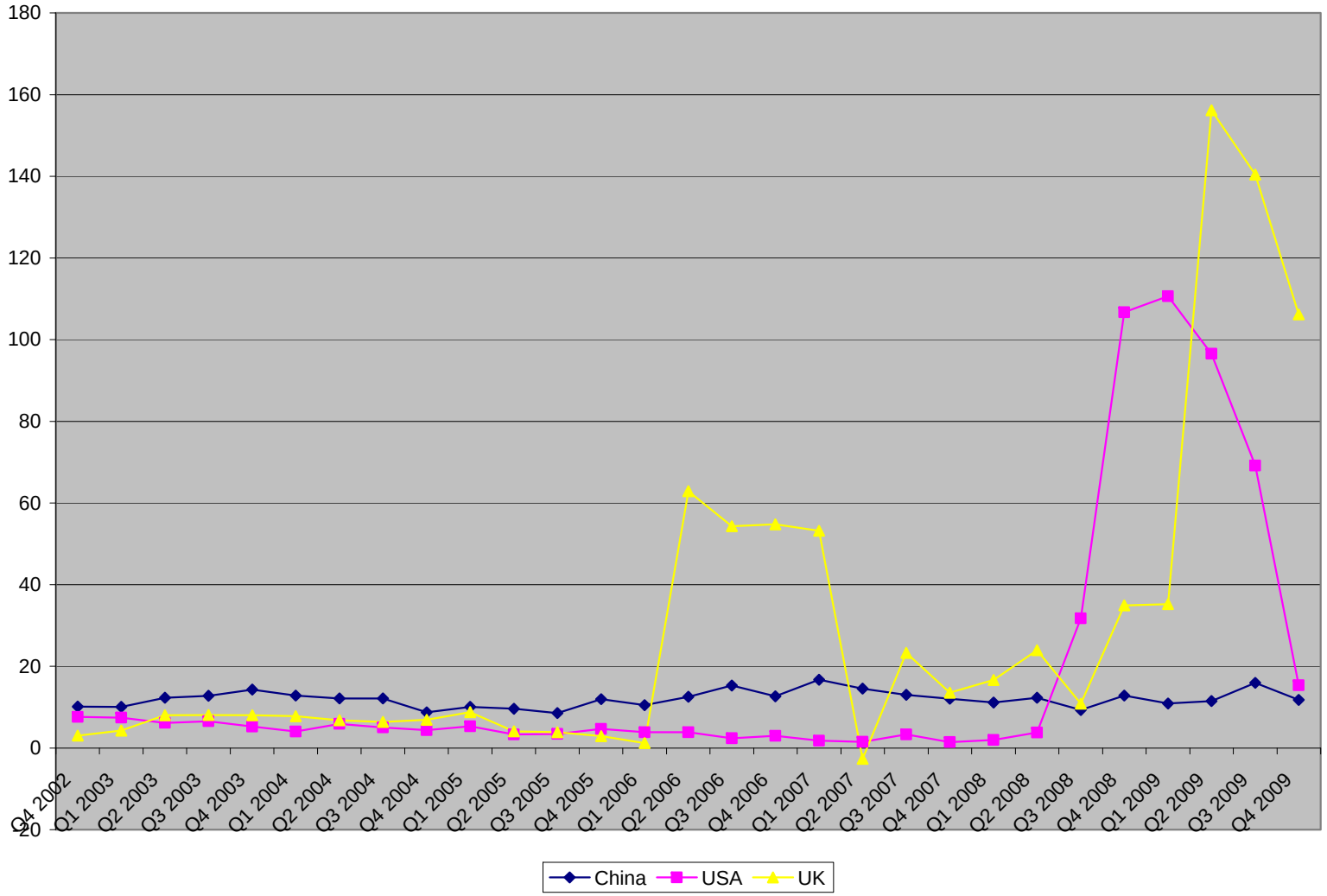
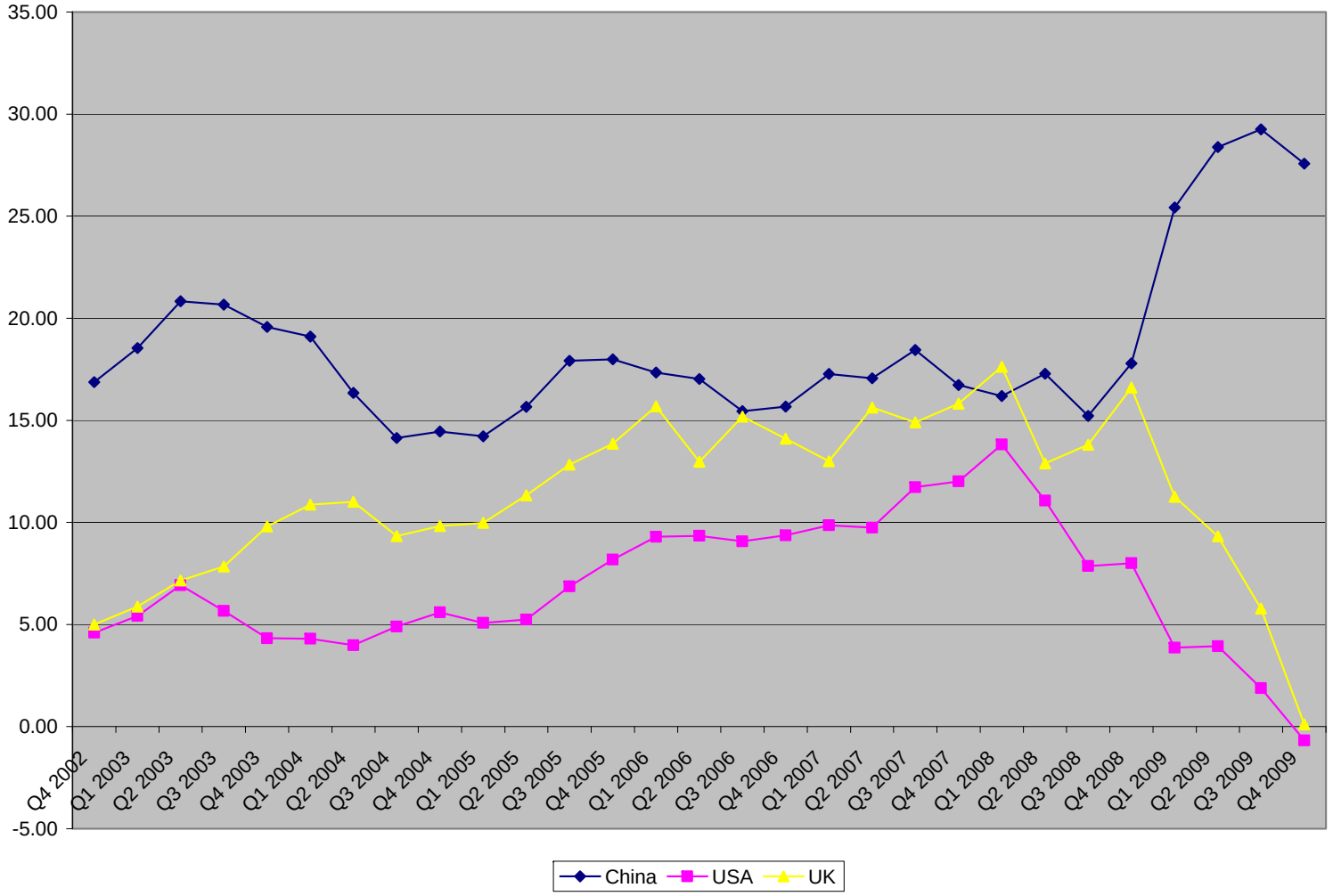


Figure 3: Growth of Monetary Base (M0) in China, United States and United Kingdom: 2002:4Q to 2009:4Q (%, yoy)



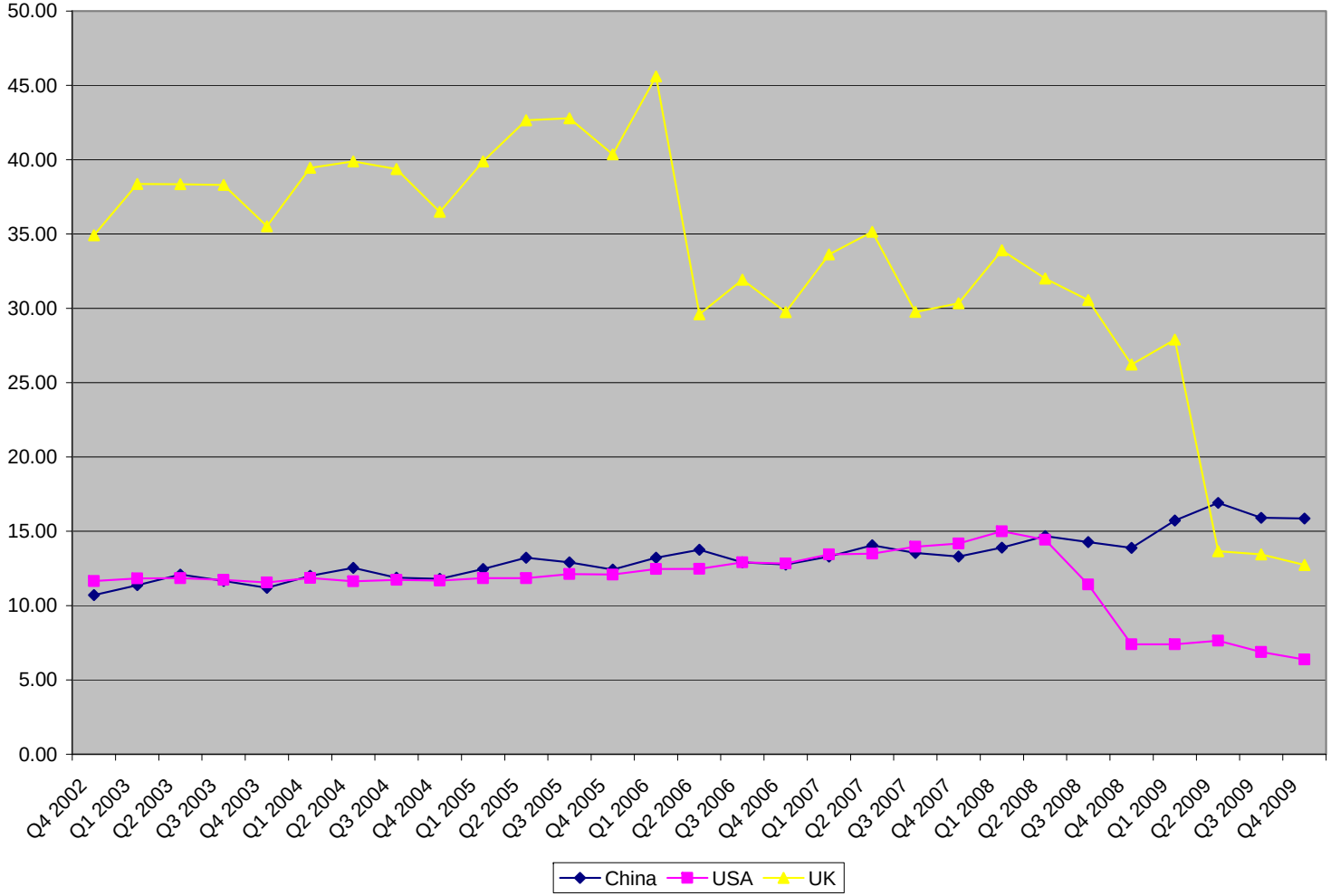
Definition of money used: National definition for China, and IMF definition for USA and UK

Figure 4: Growth of Broad Money (M2) in China, United States and United Kingdom: 2002:4Q to 2009:4Q (%, yoy)



Definition of money used: National definition for China, and IMF definition for USA and UK

Figure 5: Money Multiplier (M2/M0) in China, United States and United Kingdom: 2002:4Q to 2009:4Q



Definition of money used: National definition for China, and IMF definition for USA and UK