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## **High Wealth Concentration, Porous Exchange Control, and Shocks to Relative Return: the Fragile State of China's Foreign Exchange Reserve<sup>1</sup>**

**Victor Shih  
Northwestern University**

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### **Summary**

- China has three structural causes of capital flight. First, wealth in China is highly concentrated. Using three different methodologies based on survey data, data on large share holders of listed company, and data on the total financial and real estate assets in China, the wealthiest 1% urban households command between 2 and 5 trillion USD in wealth.
- A 20% reallocation of this wealth overseas would cause a substantial but likely controllable drainage of China's foreign exchange reserve.
- A 30-40% reallocation of this wealth overseas would see the depletion of China's foreign exchange reserve by close to 1 trillion USD or more.
- Second, underground banks, false trade invoicing, and now an experimental scheme to allow individual investors to invest overseas provide multiple channels for capital to circumvent China's exchange control.
- Third, real deposit interest rates are negative and will remain so in the foreseeable future, thus prompting wealthy households to speculate overseas on a large scale if relative returns suddenly decrease in China.
- If the top 1% of households in China reallocates 1 trillion USD of their wealth overseas, the central bank then will be faced with a choice between large scale quantitative easing and an illiquid banking system.
- In the short term, China's only recourse to reduce the volatile state of its foreign exchange reserve is to bring real interest rates back to positive territory.

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<sup>1</sup> I thank Barry Naughton for comments and suggestions on the preliminary draft. All mistakes are my own.

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At a time when China is the favored investment destination in the global market, it seems unlikely that it would ever face capital flight. Two assumptions are key in the optimistic scenario. First and foremost, China has capital control enforced by the State Administration of Foreign Exchange (SAFE), which provides a safeguard against large scale capital flows (Wen and Huo 2009). Related, if wealth in China is evenly distributed, capital flight by the wealthy few would not have any significant impact on the foreign exchange reserve. The findings of this paper cast doubt on both of these assumptions.

China in fact faces three major structural causes of capital flight. First, the empirical portion of this paper will conduct three calculations to show that the wealthiest 1% households in China commands wealth that is at least as large as  $2/3$  of the foreign exchange reserve and possibly as high as nearly twice its size. Thus, if the top 2.1 million households in a nation of 1.3 billion people decide to move even 30% of their wealth overseas, the foreign exchange reserve will reduce by a trillion dollars or more. Second, despite official foreign exchange control, numerous channels, especially those through China's current account, exist to move capital in and out of China. Third, households, which are net savers, face a negative 3 plus percent in real return from bank deposits and Chinese treasury bonds, forcing them to constantly look for higher returns than inflation rates. These three conditions combine to create extremely fragile conditions for China's foreign exchange reserve, which is the backbone of the entire financial system of China. If the foreign exchange reserve is depleted by capital flight, the central bank will need to resume large scale money creation, as it did in the 1980s and the 1990s, to maintain the solvency of the banking sector (Walter and Howie 2011; Shih 2004).

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## **The High Concentration of Wealth**

In this part of the paper, I estimate the total wealth of the top 1% of urban households in China in 2010. In 2010, the top 1% of urban households made up 2.1 million households and roughly 5.2 million individuals (National Bureau of Statistics various years).<sup>2</sup> These individuals make up only 0.4% of China's total population. This study focuses only on urban households because the vast majority of the super rich in China are located in cities due to inherent urban-rural inequality and due to the fact that many rural rich have found a way to obtain urban residency. These households have net worth that ranges between close to 1 million USD to well over 10 billion USD. If these households' wealth totals well above China's 2.8 trillion dollar foreign exchange reserve, it would only take the partial reallocation of their wealth overseas to cause a substantial depletion of China's enormous foreign exchange reserve. In contrast, if their wealth is much smaller than China's FX reserve, it would require the panicky reallocation of wealth by millions more to severely deplete China's enormous foreign exchange reserve, which is highly unlikely. Thus, obtaining even a rough estimate of the wealth of the top 1% households allows us to gauge the degree to which China is vulnerable to capital flight.

Even when there is capital control and the state's propaganda machinery instills confidence in the vast majority of the population, panic even among a subset of this richest—and also the most knowledgeable-- set of insiders may have an enormous impact on the foreign exchange reserve. For one, these high net worth households are

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<sup>2</sup> The *China Statistical Yearbook* reports that the average household in the top income decile had 2.5 individuals, in contrast to lower deciles, which had nearly 3 individuals per household. See (National Bureau of Statistics 2009)

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also among the most knowledgeable about the global financial system and have the most extensive ties outside of China. They likely have traveled overseas and to Hong Kong (Choi et al. 2010; Wang 2010b). Many of them have children who are studying or working overseas. Many of them already have purchased real estate or have invested in hedge funds overseas (Choi et al. 2010). Second, the wealthiest individuals in China are likely among the most powerful politically either due to their ability to “befriend” the political elite or because they themselves are close relatives or friends of the political elite in the first place. In recent years, some children of senior officials have founded their own private equity funds, thus directly earning large sums from China’s economic miracle (FT Reporter 2010). Given their political power, circumventing China’s foreign exchange control would be easier for them than for other segments of the population. Furthermore, they constitute the “smart money” in China as they are the most likely to have advance information on economic and political shocks confronting China. Because they represent only a small group of people in a nation of 1.3 billion people, are politically powerful, and have many overseas ties already, the one remaining question is the concentration of their wealth.

### *Existing Works*

Uncovering the wealth of the wealthiest is tricky business, especially in an opaque system like China, where many wealthy individuals have strong incentive to hide their wealth. Existing studies mainly rely on household surveys and estimation based on the Lorenze curve. Both approaches suffer from drawbacks in estimating wealth at the highest level, above the top 1% of urban households. For the survey approach, the

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wealthiest households are often left out of the survey, or they lie or refuse to answer questions about their income and wealth (Wang 2010a). For the Lorenze curve approach, data from data-rich countries are used to fit the shape of the Lorenze curve in data-poor countries like China. However, if Chinese wealth inequality is in reality much higher than other similar countries, the Lorenze curve approach would tend to miss the wealth of the wealthiest. As a result, most existing approaches likely have under-estimated the true extent of wealth at the highest level.

The most authoritative recent work in the academia was an article written by Zhao and Sai, using the official China Household Income Project (CHIP) survey data from 2002 (Zhao and Sai 2008). The CHIP data reveal that the top 10% of households in 2002 possessed 32% of financial assets in urban areas (Zhao and Sai 2008). Although startling because the lowest 70% of urban households owned about the same share of total financial assets, this survey likely missed a large amount of financial wealth at the top end. Total urban population in 2002 was 502 million, and when I assign 7637 yuan—the per capita urban bank deposits found in the CHIPS survey—to everyone in urban China, the sum of bank deposits is 3.8 trillion yuan. However, PBOC data from 2002 reveal that household bank deposits totaled 8.6 trillion RMB, leaving a whopping 4.8 trillion yuan gap unexplained by the survey (People's Bank of China 2009). When the average value of stocks found in the survey is assigned to everyone in urban China, stock holding sums to 644 billion yuan. However, the market capitalization of the stock trading in the Shanghai Stock Exchange alone in 2002 was 2.5 trillion yuan (Shanghai Stock Exchange 2010). Clearly, a lot of financial assets were unaccounted for using the survey approach, even in 2002.

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Private sector consulting firms have also estimated the wealth of the richest households in China in order to size up the market potential for luxury goods and wealth management. Both Merrill Lynch and Boston Consulting Group issue annual reports on global wealth, which estimate the total wealth of high net worth individuals (HNWIs) globally and in various regions. The *2010 World Wealth Report* issued by Capgemini Consulting and Merrill Lynch estimates a total of 477,000 Chinese HNWIs with at least 1 million dollars in investible capital in 2009, which was up 30% from 2008 (Capgemini and Merrill Lynch Wealth Management 2010). Boston Consulting Group's *China Wealth 2010* estimates similarly that there were 670,000 households with investible capital above 1 million USD (Choi et al. 2010).

Although informative, these estimates only provide a rough lower bound on the total wealth of the wealthiest in China. When 1 million dollar is assigned to each HNWI in the two estimates, at minimum HNWIs in China had at minimum of 477 billion and 670 billion USD in wealth at the end of 2009, respectively (Choi et al. 2010; Capgemini and Merrill Lynch Wealth Management 2010). These reports do not provide any information that allows us to gauge the amount of wealth above these levels.

Furthermore, the Capgemini and Merrill Lynch report is leveraging information from other countries to fit Chinese HNWIs on an established Lorenze curve (Capgemini and Merrill Lynch Wealth Management 2010). An approach is laden with potentials for errors if the starting assumptions are incorrect. For example, instead of calculating the amount of household wealth in China from official sources and survey data, Capgemini and Merrill Lynch simply estimated total household wealth in China on the basis of a global data set on wealth around the world. However, at least in the financial wealth area,

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China is highly unusual among developing countries in having bank deposits which well surpass GDP level. Thus, total wealth and wealth accruing to the top 1% of households are both likely to be significantly higher than global norms. When 1 million dollars is allocated to each of the estimated 477,000 HNWI's in the Merrill Lynch report, total wealth of these individuals only sums up to 3.17 trillion yuan, which is only 12% of the 26 trillion yuan in household bank deposits at the end of 2009. Given that in developed countries, the top 1% of households typically own 10 to 35% of total wealth, the 12% share of bank deposits by these HNWI's would make China one of the most equitable societies in the world (Zhao and Sai 2008)!

The most insightful studies on the wealthiest households in China instead either systematically mine official financial data or use an unusual survey methodology to capture household grey income. Professor Wang Xiaolu at the China Reform Institute carried out a series of path-breaking surveys which gauge the amount of "grey income" missed by the official household surveys. Instead of random sampling, Wang pursued a network sampling which saw enumerators reaching out to their own networks of families and friends to get a sense of their income and consumption (Wang 2010a). Because the enumerators are known to the survey subjects, they are more likely to reveal the truth on their unofficial income and the level of consumption. Relying mainly on consumption data, Wang then estimates the true income of the surveyed households using the Engel coefficient, the falling share of income that people spend on food as their income rises (Wang 2010a). Through this method, Wang uncovered an estimated 9.3 trillion yuan (30% of 2009 GDP) in hidden income unreported by the official household survey in 2009. Furthermore, Wang estimated that 63% of the grey income accrued to the top 10%

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of urban households. This was an important finding which goes a long way to explaining the disjuncture between people's general perception of rapidly rising inequality and the moderate degree of inequality reported in the official data.

Because Wang's 2009 survey is a vast improvement over official household data, his findings will be the basis of one of the approaches in estimating the wealth of the wealthiest in China. However, even with this unconventional sampling technique, Wang admits that he has dropped households with potentially the highest income from his survey, while the vast majority of the richest households are simply missed due to the limited social networks of the enumerators (Wang 2010a). Thus, one must add the wealth of the wealthiest households to any findings derived from Wang's work.

Finally, Hurun Consulting, founded by Luxembourgian accountant Rupert Hoogewerf, has provided wealth estimates of the richest individuals in China for over a decade with the annual issuance of a "Richest People in China" list since 1999 (Hurun 2010). Although Hurun's work only roughly estimates the wealth of those with net worth below 1 billion yuan, the consulting company has devoted an enormous amount of energy in calculating the total wealth of the richest 1300 or so households in China. Drawing mainly on regulatory filings of listed companies and media reports on real estate acquisitions of the super-rich, Hurun has compiled a detailed picture on the wealth of the wealthiest in China (Hurun 2010). The 2010 report issued by Hurun revealed that the top 1350 households in China had a combined net worth of 5.33 trillion yuan. This will provide another important foundation in the estimates below.

The main drawback in the Hurun reports is the inclusion of "hidden" HNWI's whose wealth is controlled through a maze of holding companies and therefore whose net



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worth is difficult to estimate. Hurun roughly estimates, on the basis of “gut feeling,” that there are twice as many such hidden HNWIs as there are public ones at the above 1 billion yuan level (Hoogewerf 2011). Yet, at the very top of the wealth pyramid, Hurun believes that the public figure captures most of the HNWIs at the above 50 billion yuan level (Hurun 2010). In the 10 million to 1 billion yuan range, Hurun very roughly estimates the number of HNWIs in the 10 million and the 100 million yuan range on the basis of the geographical dispersion of luxury real estate. This estimate is far from satisfactory.

On the basis of the data compiled by Wang (2010a) and Hurun (2010), as well as data on financial and real estate assets, I derive three methods of estimating the wealth of the richest 1% of urban households in China. The first approach combines the findings by Wang and official household data on income. The second approach relies only on Hurun’s estimates of the number of households at the above 10 million yuan range. Finally, the third approach mainly relies on official statistics on total household financial assets and estimates of the total value of real estate assets in China. All three approaches use independent data sources to estimate the wealth of the richest households in China. These three approaches should give us a reasonable range for the total wealth of the richest 1% of households in China.

*Approach 1: Wealth as the Accumulation of Official and Grey Income*

In this first approach in estimating the total wealth of the top 1% of urban households, I combine Wang’s findings with official survey data on household income and augment it with Hurun’s data on the highest income households. In essence, wealth

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is a fixed stock of assets in a given time, which is the accumulation of unspent income from all previous periods, including income from capital appreciation (Zhao and Sai 2008). Although Wang only carried out studies on grey income in 2005 and 2009, one can infer a trajectory on the growth of grey income for the top decile on the basis of the two surveys. Between 2005 and 2009, grey income grew at an average annual rate of 24%, so this same growth rate is imposed on all of the grey income observations. This seems like a reasonable assumption since even during a global financial crisis, the wealthiest households in China saw robust increases in earnings. In terms of official income, official statistics derived from household surveys provide average income of households in the top decile, which on average grew at 13% between 2000 and 2010. When both Wang's estimate of grey income and official income in the top decile are multiplied to the number of households in the top decile, a total income for households in the top decile is derived between 2000 and 2010.

The greatest challenge is to figure out the share of income in the top decile which accrued to the top 1% of households. Instead of imposing a single number, I present three scenarios which see the top 1% of households taking 30%, 40%, or 50% of both the grey and official income in the top 10% of households. Given the large degree of inequality between the top 10% and the rest of the households, 30-50% of annual savings accruing to the top 1% is a reasonable and perhaps even conservative range. Given that Wang observes that the top decile households consume a little over 20% of their annual total earnings, I conservatively estimate that the top 1% households spent 15% of their total earnings between 2000 and 2010 (Wang 2010a). I then derive annual savings by subtracting consumption from the estimates of total earnings between 2000 and 2010. As

the equations below show, the summation of savings between 2000 and 2010 and the wealth of the top 1350 households is the wealth of the top 1% of households.

$$\text{WEALTH} = \sum_{t=2000}^{t=2010} \text{SAVINGS}_t$$

$$\text{SAVINGS}_t = \text{GREYINCOME}_t + \text{OFFICIALINCOME}_t - \text{CONSUMPTION}_t$$

$$\text{Where } \text{CONSUMPTION}_t = 0.15 * (\text{GREYINCOME}_t + \text{OFFICIALINCOME}_t)$$

**Table 1: Savings of Top 1% of Urban Households if They Retain 30%, 40% or 50% of Official and Grey Income in the Top Decile**

Year	Savings if top 1% retains	Savings if top 1% retains	Savings if top 1% retains
	30%	40%	50%
2010 (trln yuan)	2.61	3.46	4.35
2009 (trln yuan)	2.15	2.85	3.58
2008 (trln yuan)	1.77	2.35	2.95
2007 (trln yuan)	1.45	1.92	2.42
2006 (trln yuan)	1.19	1.58	1.99
2005 (trln yuan)	0.99	1.32	1.66
2004 (trln yuan)	0.82	1.09	1.37
2003 (trln yuan)	0.67	0.89	1.12
2002 (trln yuan)	0.55	0.73	0.92
2001 (trln yuan)	0.45	0.60	0.76
2000 (trln yuan)	0.37	0.50	0.62
Total Wealth (trln yuan)	13.04	17.29	21.73
Total Wealth (trln USD)	1.97	2.61	3.29

Source: Wang (2010), NBS

Table 1 reports three main results. When the top 1% of urban households only retained 30% of the official and grey income accruing to the top 10% of urban households, the top 1% has accumulated 1.97 trillion USD in wealth in the past 10 years. If the top 1% retained 40%, then they have accumulated roughly 2.61 trillion USD in

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wealth. Finally, if the top 1% was able to command 50% of the wealth in the top decile, they have accumulated 3.29 trillion USD in the past ten years.

There are two potential upward biases and three substantial downward biases in this approach. First, grey income might have grown at a slower rate before 2005 than the average growth rate of 24% seen between 2005 and 2009. This is highly unlikely because China had been a much more equal society in the 1990s than it was in the 2000s (Zhao and Sai 2008). Wealth accumulation in the top 1% was likely rapid in the 1990s and early 2000s, perhaps even more rapid than 24%. Another potential upward bias is the fixed consumption rate, which might have been higher in the earlier years because average household income, even in the top 1%, was lower. This bias, however, is unlikely to change the results substantially.

The two downward biases definitely exist, but the precise scale of these biases is unknown. For one, this approach does not take into consideration all the wealth accumulated prior to 2000. This is done because income data for the top 10% households were simply unavailable before 2000 and because little is known about the accumulation of grey income prior to 2000. However, it would be reasonable to infer that the top 1% of household accumulated several trillion yuan even prior to 2000. In addition, even with Wang's data on grey income, he likely was unable to sample the super wealthies, who command trillions of RMB in wealth. Given these large downward biases, it is reasonable to add 1 trillion USD to the estimates above, which would result in total wealth in the top 1% of households between 3 trillion USD and 4.29 trillion USD.

*Approach 2: Extrapolate from the Hurun Data*

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The second approach, based on the Hurun estimates, is a straight-forward calculation of total wealth among the wealthy on the basis of data revealed by Hurun. In the 2010 report, Hurun estimated that there were 200 individuals with a net worth of at least 10 billion yuan; 700 with at least 5 billion; 4000 with at least 1 billion; 55000 with at least 100 million; and 875,000 with at least 10 million (Hurun 2010). Furthermore, Hurun provides precise estimates for the wealth of a subset of these individuals—mainly the richest with listed companies whose worth can be estimated from the market value of shares. In the Table below, the average wealth of public HNWI's in the three highest tiers (over 10 billion, over 5 billion, and over 1 billion) are calculated on the basis of Hurun data. Although the net worth of hidden HNWI's is not provided, Hurun estimates the total number of hidden HNWI's in the top three tiers (Hurun 2010). I simply apply the average wealth of the public HNWI's in a given tier to the hidden ones in the same tier to estimate the total wealth held by individuals in the top three tiers. Below the top three tiers, Hurun provides an estimate of the total number of 100 millionaires and 10 millionaires. Because Hurun provides no information on the distribution of wealth in these two lower tiers, I make the conservative assumption that the average wealth of the 100 millionaires is 100 million yuan, while the average wealth of the 10 millionaires is 10 million yuan. Summing up the wealth of HNWI's in the various tiers, I arrive at nearly 30 trillion yuan, or 4.5 trillion dollar (Table 2).

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**Table 2: The Number and Average Net Worth of HNWI's in Different Asset Tiers**

Category	Number of Public HNWI's	Number of Hidden HNWI's	Average Net worth of Public HNWI's (bln yuan)	Average Net worth of Hidden HNWI's (bln yuan)	Total Wealth in this tier (bln yuan)	Total Wealth (bln USD) <sup>3</sup>
Over 10 billion yuan	97	100	19.1	19.1	3762.7	565.8195
Over 5 billion yuan	184	420	6.6	6.6	3986.4	599.4586
Over 1 billion yuan	989	2600	2.22	2.22	7967.58	1198.132
Over 100 million yuan	0	55000	0.1	0.1	5500	827.0677
Over 10 million yuan	0	875000	0.01	0.01	8750	1315.789
Total					29966.68	4506.268

Source: (Hurun 2010)

The Hurun approach is problematic, to be sure. First, the Hurun study only covers 934,390 individuals. Even if one assumed that each HNWI covered in the study represents a household, this would fall short of the goal of estimating the wealth of the top 2.1 million households in urban China. Hundreds of thousands of households that earned over or close to a million USD in 2009 were not covered by the Hurun report. Second, the number of households in the 10 million and 100 million tiers is roughly estimated, and Hurun has no information on their distribution. Thus, the simplifying assumption that their wealth is 10 million and 100 million respectively substantially underestimates their true wealth. Finally, personal communication with the founder of

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<sup>3</sup> At an exchange rate of 6.65 yuan to the dollar.

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Hurun, Rupert Hoogewerf, reveals that the estimate for the number of hidden HNWI stems from a “gut feeling” that many high level HNWI are missed by only looking at publicly available information (Hoogewerf 2011). In other words, there are no data on the exact number of hidden HNWI in China. In the 5 billionaire and billionaire tiers, Hurun basically assumes that there are two hidden billionaires in these categories for every public billionaire, which may be too high.

Overall, this approach contains three obvious biases which may somewhat cancel out each other. First, given that the objective is to calculate the wealth of all of the top 1% households, the exclusion of a large number of households with nearly or over a million dollar in assets drastically reduces the estimate. Moreover, the lack of information on the 10 and 100 millionaires also biases the estimates downward. However, the inclusion of so many hidden HNWI may significantly over-shoot the estimated wealth. Because the first two biases seem greater, the 4.5 trillion dollar figure represents a reasonable and perhaps even conservative estimate of the wealth of the top 1% of urban households.

### *Approach 3: Total Financial and Real Estate Assets*

In the final approach, I first calculate the total value of household financial and market real estate assets. I then create three different scenarios for the top 1% to hold different percentages of the total amount. Because older surveys provide information on the share of financial assets held by the top 10%, I am able to create reasonable scenarios for the share of financial assets held by the top 1%. There is also one older official estimate on the share of real estate assets held by the top 10%. On that basis, I can again

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make some educated guesses on the share of market real estate assets held by the top 1% of urban households.

Total household bank deposits at the end of November 2010 were 29.7 trillion yuan. The central bank conducted research two years ago on the distribution of deposits in all the deposit accounts in China to ascertain the level of coverage that would be needed in a deposit insurance scheme. To the dismay of the PBOC researchers, they discovered that the top 10% of household deposit accounts in China held over 90% of the household deposits.<sup>4</sup> In a similar vein, Wang Xiaolu also cites a government study which puts the share of household deposits held by the top 5% of households at 60% in 2004 (Wang 2010b). Finally, in a government study done in 1999, it was found that the top 1.3% of households owned 31% of all financial assets, which was mainly in bank deposits in 1999 (Sun 2004). Assuming that wealth inequality has risen in the past few years, it would not be unreasonable to assume that the top 1% of households at minimum held 30% of the total household deposits at the end of November 2010. The three scenarios for deposits held by the top 1% of households are then 30%, 40% and 50%.

We also apply the same ratios for household bond holding and stock holding. For bond holding, Chinabond.com conveniently reports bond holdings by different kinds of investors (Chinabond.com 2010). Because I am only interested in household wealth, I count both treasury and corporate bond holdings by individuals and mutual funds. Although insurance companies held a large amount of bonds, individuals in most cases cannot liquidate their investment in insurance policies. Thus, I do not consider assets held by insurance companies as household financial wealth.

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<sup>4</sup> Interview in Beijing 11/18/2010



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Stocks in China fall into two categories: uncirculated stocks and traded stocks. Corporations, in many cases state-owned entities, and state investment funds like the National Social Security Fund hold all of the uncirculated stocks, so they are not held by households. Of the 19 trillion yuan or so in traded stocks, very little is owned by households below the 50<sup>th</sup> percentile, even back in 2002 or 2007 (Zhao and Sai 2008; China Securities Regulations Commission 2010; Urban Department of the National Bureau of Statistics 2009). However, state-owned investment funds and corporations own a large share traded stocks. Because the Hurun estimate of the net worth of the top 1350 public billionaires in China is mainly based on their holding of their companies' stocks, I can reasonably infer that stock holding made up around 4 trillion yuan of the 5.34 trillion yuan uncovered by Hurun for the top 1350 billionaires (Hurun 2010). Given the large amount held just by the top 1350 households, it seems reasonable to peg the minimal share of traded stocks held by the top 2.1 million households at 30%, or 5.7 trillion yuan based on November 2010 market capitalization (China Securities Regulations Commission 2010).

In terms of trust products, which banks use to move loans off-balance sheets, the total amount outstanding is estimated at over 2 trillion yuan at the end of June in 2010 (Reuters 2010). However, because there is always minimum investment floors in the tens of thousands yuan on trust products, only the upper middle class and the rich can afford to invest in trust products. Thus, for all three scenarios, I peg the share of trust products held by the top 1% of households at 50%. Finally, across all three scenarios, I assume that the top 1% of households directly or indirectly have claims over all of the 500 billion yuan or so invested in private equity funds and hedge funds specializing in commodities

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futures, both of which are distinct from publicly traded stock holding (Yang et al. 2010; Chen 2010). This seems like a reasonable assumption given that the minimum investment requirement for most private equity and hedge funds in China is 500,000 yuan (Yang et al. 2010). To be sure, listed companies, trust companies, and hedge funds must deposit money they received from investors into banks, but they would deposit it in corporate accounts rather than individual accounts in most cases. Thus, our calculation for bank deposits, which only takes into account household deposits, does not overlap with the other categories of financial investment.

Finally, I estimate the total real estate assets held by the top 1% of households. Here, I exclude from the analysis policy housing that was assigned to or sold to civil servants, professors, and workers in large SOEs at subsidized prices. There are restrictions on selling policy housing in some cases, so it may not be considered the private assets of the households. Instead, I estimate the total value of market housing (商品房) which was sold to urban residents from the 1990s onward at market prices. Wang (2010b) estimates that between 1994 and 2007, market housing worth 9.4 trillion yuan was sold to urban residents. From recent research on the average price and floor area of market housing sold in the past few years, an additional 8.85 trillion yuan in market housing was sold to urban residents between 2008 and the first half of 2010 (Li 2010). Thus, in total around 18.25 trillion yuan in market housing was sold to urban residents since 1993. However, this is only the total value of market housing at the time it was sold to the buyers. Although some of the older constructions have been demolished with little compensation to owners, much of the market housing stock built after 1993 has

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appreciated tremendously. Thus, the 18.25 trillion figure is a very conservative estimate of the total market value of privately owned housing in China.

The only clue on the distribution of real estate assets comes from the 2002 survey on household wealth, which found that the top 10% of households owned 35% of urban real estate value. However, this survey also considers the value of policy and public housing, which presumably is held mainly by households below the top 10%. When only market housing is considered, the share held by the top 10% was likely above 40%, even back in 2002. As prices of market housing sky-rocketed in subsequent years, the share of market housing held by the top 10% presumably also grew, as did the share held by the top 1%. Still, because middleclass urban residents who bought market flats at low prices in the early years mostly still live in them today, the share of market housing held by the super rich is likely lower than their share of financial wealth. Thus, in real estate assets, the lowest reasonable share held by the top 1% of household is pegged at 20% instead of 30% for financial wealth. Also, if there is a major political or economic shock, it would be much harder for HNWI's to suddenly liquidate all of their real estate holding. Thus, even if they held a high share of market housing in China, the top 1% is very unlikely to be able to liquidate more than 40% of the value of market housing within a relatively short period.

In most conservative scenarios below, the top 1% of urban households possessed 30% of total household deposits, bond holding, and traded stock holding, while also owning 20% of total market real estate. In the second, scenario, their share of financial assets goes up to 40%, while the share of real estate assets is 30%. Finally, at top end, I assume that the wealthiest 1% held 50% of all financial assets and 40% of market real

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estate assets. Through all of the scenarios, the wealthiest 1% held 50% of all trust products and 100% of private equity and commodities hedge fund assets.

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**Table 3: Three Scenarios for Top 1% Households' Financial and Real Estate Assets**

	Total (bln yuan 11/2010_	Top 1 % Holds 30% of Deposits, Stocks, Bonds; 20% of RE	Top 1 % Holds 40% of Deposits, Stocks, Bonds; 30% of RE	Top 1 % Holds 50% of Deposits, Stocks, Bonds; 40% of RE
Household Bank Deposits (bln yuan)	29775	8932.5	11910	14887.5
Household Bond Holding (bln yuan)	754	226.2	301.6	377
Market Value of Circulated Stock (bln yuan)	19000	5700	7600	9500
Trusts (bln yuan)	2000	1000	1000	1000
Domestic PE Funds and Commodities Hedge Fund (bln yuan)	500	500	500	500
Market Real Estate (bln yuan)	18250	3650	5475	7300
Total Household Assets (bln yuan)	70279	20008.7	26786.6	33564.5
Total Household Assets (bln USD)	10568.27	3008.827	4028.06	5047.293

Source: PBOC, CSRC, Chinabond.com.cn, Wang (2010), Li (2010)

Table 3 reveals that the estimated tradable financial and real estate assets in China totaled 70.2 trillion yuan in late 2010, or 10.5 trillion USD, nearly twice as large as China's GDP in 2009. The unusually high level of financial deepening and unusually high prices of real estate gave rise to this extraordinary pool of wealth. The sum of total bank deposits and stock market capitalization in India as of mid 2010, for example, was around 2.3 trillion USD, much lower than China's astronomical level (Reserve Bank of

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India 2010). Even in the conservative case, where the top 1% owned 30% of all financial wealth and 20% of all real estate assets, they would own about 3 trillion USD in assets. If those ratios shifted up by 10%, the wealthiest 1% would own assets worth 4 trillion USD. Finally, if those ratios shifted up by 20%, the super rich would own assets worth 5 trillion USD.

The approach contains numerous downward biases. First, wealthy individuals in many cases hold personal savings in corporate bank accounts. In case of a financial panic, many HNWI's may illegally expropriate corporate savings. I simply do not know the share of the 24.7 trillion yuan in corporate savings that can be liquidated by HNWI's in China. Second, only the price of market housing at the time that it was sold to the buyers is known, not the current market price of second hand flats, which would be much higher due to recent appreciation. This may bias the estimate downward by over 1 trillion yuan. However, if a substantial share of HNWI's suddenly liquidates real estate holding, there would be a sharp depreciation of real estate prices, and only the first to sell would earn a sizable amount above the original purchasing prices. The rest would break even or take a loss. Finally, there is a sizable pool of wealth that flows between bank deposit accounts and underground bank accounts. In Wenzhou alone, some 56 billion yuan was lent out by underground banks in mid 2010 (Li and Chen 2010). Although the total size of the underground bank market may be as much as half a trillion yuan, this money is very mobile and "rejoins" the official banking system from time to time. Thus, I do not consider this pool of wealth.

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*High Wealth Concentration and Volatility in China's Foreign Exchange Reserve*

Given the three estimates of the wealth of the top 2.1 million households in China, even if a share of this wealth was reallocated overseas, it would quickly deplete a sizable share of China's 2.85 trillion dollar foreign exchange reserve. Across the three approaches, the lowest estimate stands at 1.97 trillion dollar, while the highest estimate is the third scenario in the asset based approach, which is a little over 5 trillion USD. In Table 4, I present some scenarios for capital flight on the basis of the estimates of the total wealth of the top 1% of households in China. That is, if the super wealthy reallocated some share of their total domestic wealth overseas, what impact would that have on China's foreign exchange reserve, which is reported to be 2.85 trillion USD at the end of 2010 (Panckhurst et al. 2011).

The main reason for conducting this exercise is that even the savviest wealthy households find it hard to completely diversify overseas within a short time, especially given capital control. Thus, if the foreign exchange reserve is much larger than the wealth of the wealthiest, it would take wealth allocation of tens of millions of households to cause a capital flight problem, which is unlikely. However, if the wealth of the small number of wealthy households exceeds the total size of the foreign exchange reserve, even if only some subset of this two million households reallocated their wealth overseas, it would cause a substantial depletion of China's FX reserve. The more wealth held by the super rich, the smaller share of their wealth they need to move overseas to cause a problematic drainage of the FX reserve.

**Table 4: The Impact of Wealth Reallocation by the Top 1% Households on China's Foreign Exchange Reserve**

Estimated Total Wealth Grey and Official Income Approach (bln USD)	20% Reallocation		30% Reallocation		40% Reallocation		50% Reallocation	
	Amount (bln USD)	Share of FX Reserve	Amount (bln USD)	Share of FX Reserve	Amount (bln USD)	Share of FX Reserve	Amount (bln USD)	Share of FX Reserve
1970	394	0.14	591	0.21	788	0.28	985	0.35
2610	522	0.18	783	0.27	1044	0.37	1305	0.46
3290	658	0.23	987	0.35	1316	0.46	1645	0.58
Hurun Approach								
4500	900	0.32	1350	0.47	1800	0.63	2250	0.79
Total Asset Approach								
3000	600	0.21	900	0.32	1200	0.42	1500	0.53
4030	806	0.28	1209	0.42	1612	0.57	2015	0.71
5050	1010	0.35	1515	0.53	2020	0.71	2525	0.89

The most conservative estimate, which is based on Wang's data on grey income and official income data, is over 2/3 of China's current foreign exchange reserve, 1.97 trillion dollar (Table 4). If 20% of that wealth is reallocated overseas within a short time, China's FX reserve would diminish by 14%. Thus, it would take an improbable 75% reallocation of their assets within a short time to deplete China's FX reserve by half. However, in all of the other estimates, it would take the reallocation of less than 50% of their wealth to deplete China's FX reserve by over 50%. For example, if the top 1%



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households commanded 40% of the 63% of grey income earned by the top decile, it would only take a 50% reallocation of assets overseas to deplete China's FX reserve by close to 50%. The estimate of wealth from the Hurun data suggests that even a 30% diversification overseas would deplete China's FX reserve close to 50%.

Table 4 shows that in the highest estimate, one that assumes that the top 1% of households command 50% of financial wealth and 40% of market real estate assets, even a modest 20% reallocation within a short time would deplete the FX reserve by 35%, or over 1 trillion USD. A 30% reallocation would deplete well over half of China's foreign exchange reserve. An unlikely, but still possible, 50% movement of their wealth would deplete almost the entire FX reserve.

Examining all of the wealth estimates, it seems reasonable to conclude generally that a 20% movement of the top 1% households' wealth overseas would not severely drain the FX reserve, even if it happens within a relatively short period of time. At an extremely high level of wealth concentration, a 20% reallocation would take 1 trillion USD from the FX reserve, which, although sizable, is substantially less than half of China's enormous FX reserve. However, the situation becomes more volatile if a shock compelled China's wealthiest households to reallocate 30-40% of their wealth overseas. Most of the wealth estimates show that with a 30% reallocation, one would see nearly or above 1 trillion USD flowing out of China. In some cases, over 50% of the FX reserve may be depleted. With a 40% movement of wealth overseas, the FX reserve would be depleted by over 50% in the majority of the scenarios. Again, if the wealthiest 2.1 million households in China decided to move 50% of their wealth out of China within a short period of time, the Chinese foreign exchange reserve would be depleted by 50% or

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more in most of the wealth estimates. It would not be an exaggeration to call a 40 or 50% reallocation of wealth overseas “capital flight” or “financial panic.”

Over time, rising income and wealth inequality only makes the situation more volatile, especially at a time when the growth of the FX reserve is expected to slow. In 2009, for example, the foreign exchange reserve grew by 22%, but the wealth of the super wealthy listed in Hurun grew by 26% in 2009 and 64% in the two year period between 2008 and 2009. Thus, unless policies are put into place to reverse this trend, the FX reserve becomes increasingly vulnerable to capital flight by the top 1% of households over time.

### **The Holes in China’s Foreign Exchange Control**

To be sure, capital control would make a sudden shifting of the majority of the wealth held by the wealthy difficult and costly. However, numerous channels have developed in recent years to facilitate cross-border capital movement by China’s elite and overseas speculators. In a recent media interview, the head of the general department of the State Administration of Foreign Exchange (SAFE) admitted that numerous channels existed for speculators to move money into China (Wang 2011). Those same channels, which include underground money changers, doctored trade invoicing, false reporting on the amount of money raised in overseas share offerings, and fake foreign direct investment in fixed assets, can all be reversed and become channels for moving money out of China (Wang 2011; State Administration of Foreign Exchange 2010a). The number of actors helping individuals and firms to circumvent foreign exchange regulations also seem numerous. In the recent sweep of violators on FX policies, SAFE

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found that both foreign and domestic financial institutions, firms, and individuals had violated exchange control regulations (Wang 2011). Although estimates vary, some have estimated that more than 250 billion USD in speculative capital has flowed into China in the past two years against FX regulations (Chen 2011). Meanwhile, SAFE has uncovered 193 violations against foreign exchange regulations in financial institutions since 2006, involving a mere total of 7.3 billion USD (State Administration of Foreign Exchange 2010b). The great disparity between estimates of hot money inflows and SAFE regulatory actions suggests the majority of violations against FX regulations has slipped by SAFE's regulatory purview unnoticed.

China's integral role in global trade constitutes the greatest weakness in China's foreign exchange control. Because of the liberalized current account, movement of capital is allowed as long as the involved parties can prove that the movement of capital was tied to trade transactions. Thus, to move money into China for speculation, one only needs to falsify an export invoice and to bribe customs officials to verify the invoice (Wang 2011). Because China is eager to attract foreign direct investment, local governments are often willing to exaggerate the amount in a foreign investment project, as long as part of that amount is invested in the project.<sup>5</sup> Investors can then take the remainder to speculate in the stock market or in real estate. Finally, SAFE uncovered cases where companies exaggerated the amount they raised overseas in stock and bond offerings in order to help investors move capital into China (State Administration of Foreign Exchange 2010a). Much more so than underground money changers, it has been very difficult for SAFE to suppress hot money inflows through legitimate trade and investment channels because, as one SAFE official puts it, these transactions are "hidden,

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<sup>5</sup> Interview in a major city in northern China: 7/22/2010

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complex, and widespread” (Wang 2011). Completely shutting down current account transactions would be catastrophic to the Chinese economy, so it is not an option.

If a major shock compelled wealthy Chinese and foreign speculators to move money overseas, these same channels can be used. Instead of falsifying an export invoice, a wealthy Chinese can pay an importer a commission to falsify an import invoice, which requires payment to an overseas account. Falsifying import invoicing is especially easy if the counterparty in the trade deal is located in a developing country where customs statistics are not kept carefully. The importer then only would have to bribe Chinese customs officials to approve the invoice. Given China’s voracious appetite for commodities import, a large part of which comes from developing countries, false trade invoicing will be the main channel of capital flight, at least in the first stage of any future crisis. In fact, this may be happening to some extent already, as import grew by 55% in 2009 and 40% in 2010, which far outpaced China’s economic growth in those two years (National Development and Reform Commission 2010). An exporter can also under-invoice an export order and ask the counter party to pay into an overseas account.

With recent policies encouraging Chinese companies to invest overseas, Chinese foreign direct investment will become another major channel for capital flight. In 2009, the State Council first approved regulations allowing Chinese firms to invest overseas using foreign exchange already held in China or overseas by Chinese firms (State Administration of Foreign Exchange 2009). Although Chinese firms invested overseas before, the new regulation allowed firms to do so without State Council approval, although SAFE approval is still required. In the first 11 months of 2010, Chinese firms invested over 47 billion USD overseas (Ministry of Commerce 2010). Until recently,

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individual investors in China could only invest overseas through mutual funds investing in overseas debt and equity or get money out through underground money changers. However, in January 2011, the Wenzhou Municipal Government, home to the most vibrant private sector in China, announced an experimental scheme that allows individual investors who are Wenzhou residents to invest up to 200 million USD overseas each year (Li and Xu 2011). To be sure, under the new rule, individual investors are forbidden to invest directly in publicly traded stock, real estate, or in any financial institutions. Instead, they must invest the money in a new corporate entity or take shares in existing entities, up to 3 million dollars per entity (Zhao 2011).

At this moment, interest in the new scheme seems tepid, mainly because so many channels exist already to get money out of China. High net worth investors would like to invest overseas without revealing to the government the potentially large sums they are investing (Zhao 2011). Also, central authorities remain cautious about liberalizing capital accounts and have delayed implementation of this experiment. However, if this experiment spreads to other major cities in China, it will open up yet another major channel for funneling funds overseas at relatively low costs.

Finally, underground money changers routinely move millions of USD in and out of the country on behalf of clients. In recent cases of underground banks uncovered by SAFE and the police, clients typically used these entities to move upward of tens of millions of dollars in and out of China (State Administration of Foreign Exchange 2010a). To be sure, there is a limit as to how much money underground channels can move out of China, but billions can be reallocated this way, especially in the first stage of any capital flight episode.

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## **Shocks to Relative Returns**

Even with structural weaknesses, the top 1% of households currently has little incentive to reallocate a large share of their wealth out of China. For one, there is strong expectation for yuan appreciation, and Chinese real estate, the favorite investment destination of China's wealthy elite, has on average appreciated by 7% in the first 11 months of 2010. In Beijing, the price of new housing appreciated by a whopping 14% in the first 11 months of 2010 despite a series of government policies aimed at deflating real estate prices (National Bureau of Statistics 2010). At a time when the interest rate is essentially zero in much of the developed world, the extraordinary high returns of investing in China, especially in the real estate sector, attracted substantial amount of "hot money" investment from abroad and compelled domestic investors to invest their wealth in Chinese real estate. Yet, the negative real interest rates offered by Chinese banks and treasury bonds compels investors to constantly look for ways to earn a positive real return. If shocks diminish opportunities to earn positive returns in China or rapidly raise the average return of investing overseas, high net worth investors would reallocate a substantial share of their wealth overseas.

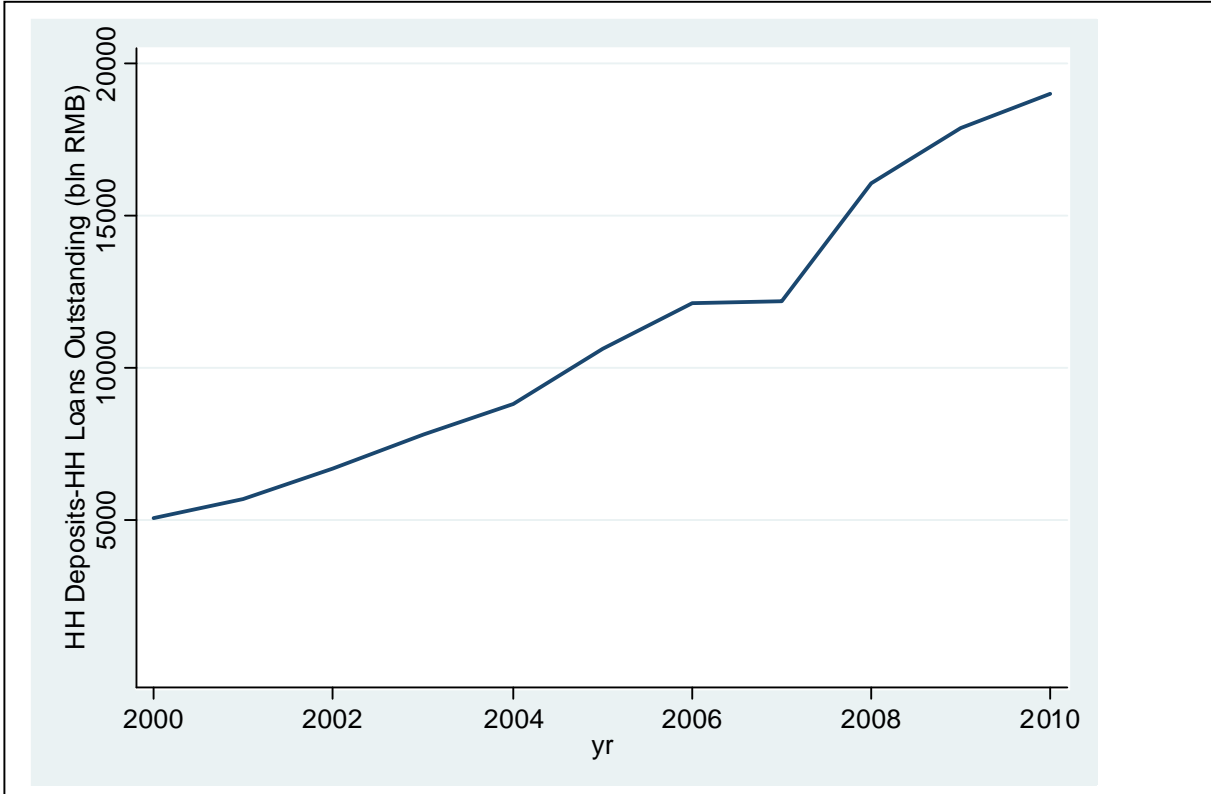
In theory, the reason for large scale capital flight is simple: "...after tax domestic returns adjusted for expected depreciation that are lower than after tax foreign returns, and domestic returns that have higher volatility or risk than foreign returns" (Hoeffler et al. 1999). In essence, it comes down to either low relative return or heightened risks of domestic investment. Contagion effect is also an important cause of capital flight, which sees the departure of some wealth leading to the flight of even more wealth (Hoeffler et al.

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1999). In addition, this paper has argued that the concentration of wealth also makes large scale capital flight more likely because of the ease of information transmission and coordination among the rich and the large impact even a partial reallocation of wealth would have on the foreign exchange reserve. All of these mechanisms have materialized or can materialize in China in the future.

First, domestic investors seeking a positive return already face great pressure from the negative real interest offered by the banks. The artificially low interest rates in China essentially takes from households and gives to the corporate sector because there is a large gap between household deposits and borrowing by households from the banks. Figure 1 shows that household net deposits in the banking system have ballooned from 5 trillion yuan in 2000 to nearly 20 trillion yuan at the end of 2010. In contrast, the corporate sector, mainly composed of state-owned or state shareholding firms, have benefited enormously by being the net borrowers on the other side. As current inflation rate is over 5%, households lose close to one trillion yuan each year in real purchasing power because 1 year deposit rates is only 2.75% while the 12 trillion yuan in demand deposits earns less than 1% interest (People's Bank of China 2010b).

**Figure 1: Household Deposits Minus Household Loans (Bln Yuan): 2000-2010**



Source: PBOC

In a repressed financial system, ordinary households must suffer in silence while inflation erodes both their income and savings. However, the wealthiest households in China, which command a sizable share of China's household deposits, will look for ways to beat negative real returns in the banking system. Wealthy households in China cannot afford to be conservative investors by placing money just in time deposits and treasuries because they will lose purchasing power over time. Thus far, domestic real estate investment seems to be these households' favorite way of beating inflation tax, especially given slow growth and low interest in the rest of the world. However, in order for the wealthy to keep their money in China, the sum of domestic investment returns, expected



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rate of yuan appreciation, and the transaction costs of moving money out must be higher than inflation rate and asset depreciation from other risk sources. Major shocks which rapidly reduce on-shore returns, devalue the RMB, increase inflation, or escalate investment risks would compel the wealthy to reallocate a substantial share of their assets overseas.

For one, an exogenous shock that causes a sudden spike in inflation that far outstrips the appreciation of real estate may compel wealthy households to reallocate some part of their savings overseas to protect it from inflation. Although interest rates are low overseas, they tend to be higher than inflation rates. Inflation induced capital flight was a serious problem in China back in the early 1990s, when the inflation rate was above 20% (Shih 2008). It also is a common cause of capital flight around the world (Alston and Gallo 2000; Hoeffler et al. 1999). This forced the Chinese government to cut credit expansion drastically to forestall inflationary pressure. Although successful, it also led to a decade of tepid growth and a large quantity of non-performing loans (Shih 2008).

However, stringent monetary policy that causes a sizable correction in the stock market and real estate market also lowers relative returns. If high inflation compels the central government to freeze credit expansion and crack down on underground banks, as China has done numerous times in the past, the stock market would deflate substantially, and highly leveraged developers and local government financing platforms would run short on capital suddenly. Given a downward shift in expected return, a sizable share of China's wealthy households may choose to seek higher returns elsewhere.

To forestall an expectation of low growth, the government may announce its intention to end monetary tightening at some point in the future. Of course, if there is a

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general expectation that the government will reverse course in the near future, there will be no panic. However, a general expectation of monetary loosening would also deprive monetary tightening of its credibility, thus continuing inflationary expectation. In fact, the Chinese government is running into this precise dilemma now. In early 2011, inflation rates show little sign of moderating, and any major upstream supply shock would bring inflation rates to dangerously high levels. The government, however, cannot respond with decisive monetary tightening because it would lead to a sizable correction of the housing market and a sudden spike of non-performing loans. Thus, the central bank is trying to navigate through this difficult period through “cautious” monetary policy. In late 2010, the central bank ratcheted up reserve requirement several times but raised interest rates only by 50bps despite inflation rates above 5%. Meanwhile, banks lent some 500 billion yuan beyond the original credit target of 7.5 trillion yuan for 2010. Finally, the government tried to minimize the dilemma by announcing artificially low inflation figures which diverged sharply with the high degree of popular dissatisfaction with inflation (People's Bank of China 2010a). While effective in the short-run, this equilibrium is extremely vulnerable to any major supply shock which may see inflation spiral out of control.

A positive shock in the world economy can likewise attract Chinese capital overseas, especially if growth in real estate prices slows. If inflation compels the US Federal Reserve to raise interest rates substantially, it may attract a large amount of capital from the developing world. Similarly, if equity prices in the US enjoy a strong bull run due to economic recovery, real returns in the US may be substantially higher than in China, thus presenting an attracting investment choice for high net worth Chinese

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investors. A major technological innovation, like new energy, which leads to the rapid development of a new sector can likewise present attractive alternatives to real estate investment in China. Related, if the transaction costs of moving large sums of money out of China are reduced because of capital account liberalization, HNWI in China may also find it worthwhile to relocate a large share of their wealth overseas.

The high degree of inequality in income and wealth also creates its own policy dilemma for the government. On the one hand, if the government fails to address this inequality, wealth accumulation among the rich will continue, making the entire system even more vulnerable to capital flight by the wealthiest households. At some point in the near future, even a 20-30% reallocation of HNWI assets overseas likely will lead to a severe drainage of the foreign exchange reserve. Moreover, if income continues to accrue mainly to the top 10% of households, mass consumption will not be a main engine of growth. Short of a continuation of 20 plus percentage growth in export, the Chinese government will have to rely on debt-financed fixed asset investment to sustain high growth rates, which also increases the risk to the entire financial system.

A decisive effort to reverse inequality via taxation, however, can also cause capital flight by the rich. In the classic example, if the government levied a small tax increase on the wealthy to finance a welfare program for the poor, it may only cause a small amount of capital to leave initially, which is harmless. However, as more wealth departs, especially if it is concentrated at the top few percentage of households, the remaining wealthy households are stuck with a rising per capita tax obligation to finance this welfare program, thus raising their incentive to reallocate wealth overseas (Hoeffler et al. 1999). To avoid this situation, the state would have to either institute equalizing tax

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arrangements before wealth has concentrated in the hands of a small number of households or at a time when the relative returns of investing domestically is high. For China, where wealth is already incredibly concentrated, the window for decisively instituting an effective equalization scheme is rapidly closing. If growth slows down in the coming years due to the lack of consumer demand and slowing investment, it would be extremely dangerous for the government to raise taxes on wealthy households substantially.

In addition to the high concentration of wealth and a relatively porous system of capital control, the repressed financial system which offers negative real interest rates compels Chinese investors to look for high yield investment opportunities. This is especially the case where wealth is highly concentrated in the small share of households, allowing them to have an enormous impact on the FX reserve. Thus far, they have found investment opportunities mainly within China. However, in the coming years, various shocks may change that equation.

### **Government Defense Against Capital Flight**

Unlike every other developing countries which have faced capital flight, China has a large arsenal of defense against any possible capital flight. However, this arsenal is not within limit. If over one trillion USD leaves the country, the central bank would have to print large quantities of money to prop up the RMB and to maintain the solvency of the banking sector. The impact of capital flight on the banking after the first trillion USD in capital flight may be particularly severe.

If the FX reserve declines by 50-100 billion a month for a couple of months, the

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Chinese government will declare victory in their rebalancing efforts and signal the end of yuan revaluation. This moderate amount of net outflows would be an unnoticeable blip in China's enormous FX reserve. There is some chance that smart money may see this as a sign of coming trouble and may accelerate their reallocation overseas. If the FX reserve declines by over 100 billion USD in a month or if it declines by more than two months in a row, the Chinese government will try to hide it by having China Investment Corporation (CIC) repay some of its bonds held by the PBOC before maturity with US dollars. This would force the CIC, which is separate from State Administration of Foreign Exchange (SAFE), to first sell its equity or bond holding to raise money. Because over half of CIC's 330 billion dollar holding is tied up with Chinese bank shares, the CIC cannot quickly sell large portions of that holding without causing a crash in the shares of Chinese banks, which would intensify a financial panic (China Investment Corporation 2010). Instead, CIC would sell its roughly 100 billion dollars in foreign corporate bonds and publicly traded shares (China Investment Corporation 2010). Even this amount of FX depletion would be hardly noticeable and is well within SAFE's ability to control.

If there is net outflows exceeding 250 billion dollars within half a year, SAFE will try to stem the flows. Instead of carrying out inspections on export invoicing, SAFE will carry out inspections on import invoicing. There will be a crackdown on underground money changers also. Indeed, when faced with an unusually high amount of outflows in the second half of 2008, SAFE began to carry out inspections against outflows (Wen and Huo 2009). However, just as the prevention of hot money inflows is ineffective today, the attempt to stop capital flight will be challenging. China cannot stop importing large

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quantities of commodities and food from developing countries, especially if there is inflationary pressure. Chinese import of foreign goods totaled over 1.2 trillion USD in 2010, a 40% increase from 2009 (National Development and Reform Commission 2010). As such, the Chinese government cannot completely stamp out import invoicing as a channel of capital flight.

If capital continues to flow out of China, the amount of assets that the CIC can unwind to raise cash will quickly run dry. This is especially the case since over half of its holding is tied down to Chinese bank shares and convertible notes. SAFE would then need to step in to unwind its assets. If we disregard international impact, China has a large foreign exchange reserve, which would take an enormous amount of outflows to unwind completely. However, even before the Chinese foreign exchange reserve is completely depleted, SAFE sale of equity and debt holdings may directly impact the solvency of domestic banks. In 2009, SAFE decided to hold 15% of its enormous portfolio in equity and corporate debt, which at today's valuation would total 420 billion dollars (Anderlini 2009). Although it is impossible to know precisely, a large share of that amount has been invested in major Chinese financial and industrial firms listed in Hong Kong and in the US. As SAFE assets fall toward 1 trillion USD, investors will begin to question the share of SAFE assets that is held in dollar denominated securities instead of Chinese company shares and debt. If this skepticism emerges, the reserve will need to contemplate the large scale sale of shares of Chinese companies and financial institutions, which may lead to a collapse of their share prices. This would make the recapitalization of the banks through the market extremely challenging.

In the mean time, deposits in the banking sector will also decrease in a significant

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way. As companies pay overseas counterparties and as HNWI's withdraw money from banks to sneak out through the underground banking system, banks will quickly become unable to make new loans since 60% of banks' loan balance is trapped in medium to long term loans with maturity above 1 year (Figure 2). The PBOC can inject liquidity into banks by redeeming the 4.1 trillion yuan in bonds outstanding. This can roughly counteract the outflow of 621 billion dollar, which is substantial. The PBOC can also decrease required reserve ratio (RRR) rapidly to prevent illiquidity in the banking system. To be sure, because China has some of the world's highest RRR (20%), there is some room for RRR reduction. However, to avoid a catastrophic credit crunch, at minimum 5 trillion yuan in new loans need to be made in a given year, which further requires reductions in RRR.

Even with this wide array of tools, an outflow of 1 trillion USD, roughly 30% or less of the wealth of the top 1%, would see the PBOC redeeming all of its bonds and bringing down RRR to the 6-7% range. Any additional outflow would completely deplete banks' reserves and force banks to halt credit expansion and even to recall loans, which would drastically increase bankruptcies and slow economic growth. To support continual credit expansion, the PBOC can also print money on a large scale, as it did in the 1980s and 1990s (Shih 2004). This likely would trigger very high inflation rates. Inflation above 20%, however, provides strong incentive for the top 1% of households to reallocate their savings overseas.

Would devaluation work? The high degree of wealth concentration may defeat the effectiveness of devaluation in stemming outward flows. The problem here is that a minor devaluation would be seen as insufficient and would raise the expectation of

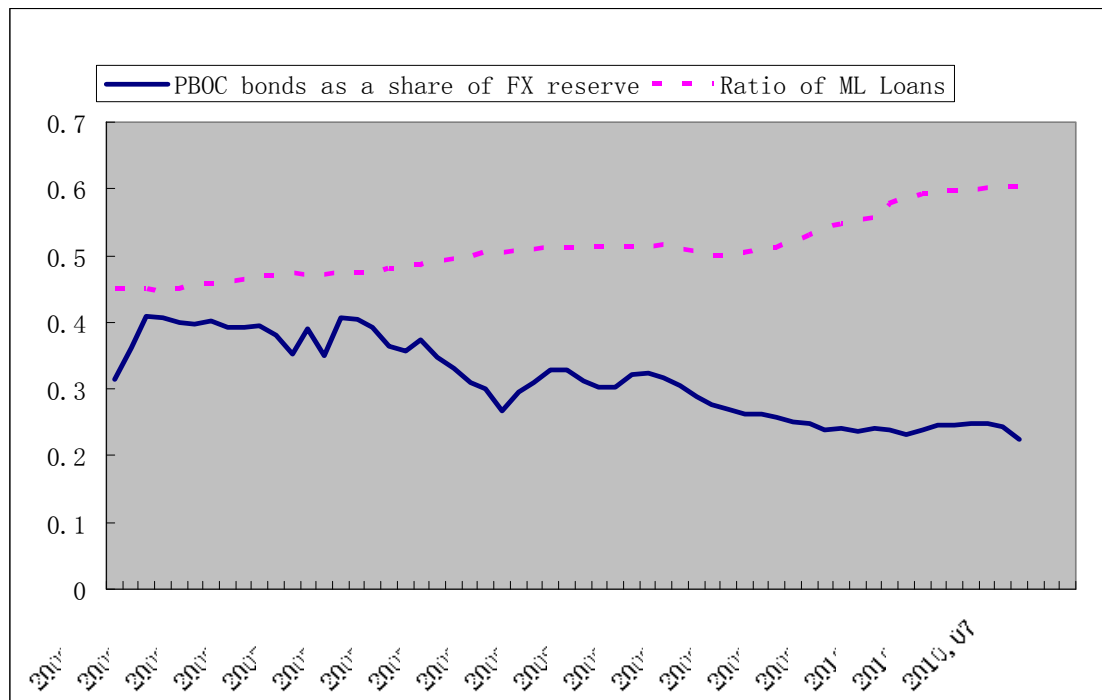
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further devaluation, prompting more outflows. As for a large one-off devaluation, a significant subset of the wealthy political elite would get wind of it before it happens and will try to get as much of their money out as possible. Given the concentration of wealth, even discussion of a significant one-off devaluation may trigger large scale capital flight.

Although minor outflows would be hardly noticeable in China, once outflows surpass half a trillion dollars, capital control may become increasingly ineffective. For one, SAFE already has a hard enough time keeping foreign money out today. Under capital flight, SAFE must engage in the much harder task of keeping the wealth of the politically powerful in China. The government also cannot completely shut down current accounts, which would lead to shortage and even more severe inflation. If the government continues to force banks to lend despite falling deposits, it would need to print large quantities of money in the midst of an inflationary episode, thus causing hyper-inflation. A severe contraction of credit expansion would lower inflationary expectation, but would also drastically reduce the returns from stock or real estate investment, thus increasing incentive to move money out. This would be the reverse of what happened in the 2008-2009 period when foreign hot money left the low returns from a battered US equity market in search for higher returns in China. The reverse situation would draw both foreign hot money and domestic HNWI's to reallocate investment overseas, which would further increase outflows. Without printing money, banks would become insolvent, which would take a long time to repair. In sum, once capital flight takes hold, the Chinese government will have few ways of forestalling it without either making the situation worse or without suffering massive economic costs.



**Figure 2: Ratio of Medium and Long Term Loans and PBOC Bills Outstanding as a Share of FX Reserve**



Source: PBOC

### The Fragile State of China's Foreign Exchange Reserve and China's Response

The world has never seen a foreign exchange reserve as large as China's 3 trillion dollar one. It is hard to imagine that capital outflows can ever diminish such a large reserve to a dangerous level. This paper, however, outlines three reasons for worries. First, this paper finds that the wealthiest households in China at least have wealth equivalent to China's current foreign exchange reserves, and their wealth is likely growing faster than the growth of the reserve. The high concentration of wealth in China means the wealthy class has high incentive and ability to move money overseas. Even if they reallocate a minority share of their wealth overseas, China's foreign exchange reserve will deplete by a significant and dangerous degree. Moreover, because these

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individuals are also close to the political elite, they will have no trouble moving money through China's exchange control, which is already porous. Finally, in an age of globalization, high net worth individuals will least of all make sacrifices at the behest of the state. This applies to China as much as anywhere else. If relative returns increase overseas due to shocks, it remains an open question whether the top 1% of households in China will leave their wealth in China.

Given the importance of trade to China's economy, there is little China can do to stop capital flows through the current account. High wealth inequality is also deeply entrenched in China's political economy by now, and any drastic attempt to reverse it may risk triggering large scale capital flight. To the extent that the Chinese government is determined to reverse income inequality, it will have to be a gradual process taking place over a five to ten year horizon. In the short term, China's only recourse to reduce the volatile state of its foreign exchange reserve is to bring real interest rates back to positive territory. By restricting credit expansion and by raising interest rates much more aggressively, China can reduce the relative attractiveness of foreign investment opportunities to the wealthiest households. This should be done even if there is only moderate degree of inflation because with negative real interest rates, even moderate shocks that change relative returns can trigger sizable outflows.

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