



“Analyses are difficult if we assume people are irrational because irrationality has limited use in making predictions

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PROF PENGFEI WANG
Professor of Economics

INS AND OUTS OF CAPITAL FLOWS AND ASSET BUBBLES

The emergence of China as a major source of capital for developed countries is a phenomenon that has caught economists and political leaders by surprise. Research at HKUST offers novel perspectives on the flows of capital in and out of China and its massive trade imbalance with the West, with economist Prof Pengfei Wang and his collaborators becoming the first to quantify this data and use it to develop a new theory to explain the dynamics involved.

Classic economic theory has long suggested that capital normally flows from developed countries, where it is abundant, to the developing. However,

economists have been perplexed as to why the reverse now appears to be true. This is particularly the case for China, which by the end of March 2017 was holding US\$3 trillion in foreign reserves, mostly US government bonds.

Prof Wang explained that this is an outcome of China’s immature financial system. Due to the underdeveloped banking-credit-financial system, households have limited investment options. At the same time, households and firms have borrowing constraints. This gap creates financial frictions: households save excessively to self-insure against unpredictable shocks. However, their huge financial capital cannot be effectively channeled to firms.

Prof Wang observed that financial capital in China yields a lower rate of return compared with the US. This drives domestic household savings to flow to the US for higher returns, despite government-imposed currency restrictions, and the rise of informal financing platforms. He also noted that



Prof Wang's work shows how China's underdeveloped financial system explains the capital flows in and out of China and its massive trade imbalance with the West.

50% of GDP

China's total accumulated net financial capital outflows to developed countries in 2010

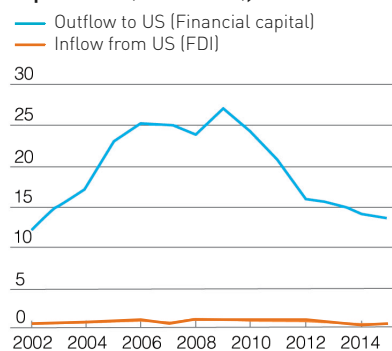
capital is flowing from the US to China in the form of Foreign Direct Investment (FDI), which involves the investment in a firm's machinery and equipment. This is because China has a higher rate of return on fixed capital than the US – consistently over 20% in recent decades.

"Many countries accuse China of manipulating its exchange rate by keeping it artificially low to generate a huge current account surplus," said Prof Wang, whose findings, published in *The Economic Journal* (2015), dismiss currently popular political views. "We argued this was not the case. First, it is the real exchange rate, and not the nominal exchange rate, that determines the current account balance. While China may adjust its nominal exchange

rate, the real exchange rate is determined by economic forces and not by government intervention. Second, current account surplus also exists in many other emerging countries with a flexible exchange rate, so it suggests that an account surplus is caused by other reasons. Third, we showed that financial frictions can quantitatively explain a large current account surplus in our model.

"Due to financial frictions, China is lending money to the US at very low interest rates, for example through US Treasury Bonds. But the Chinese debt repayment is very high in foreign direct investment." Since FDI earns a much higher rate of return than bonds, China always receives negative net income payments. Thus, the country needs to export more than it imports, namely run a current surplus, to finance negative net income payments.

Capital flows (China vs US), % of China's GDP



Prof Wang's theory suggests that, in the long run, if China can improve its banking-credit-financial system, household savings can be channeled more effectively to its domestic production sector. In addition, the greater availability of credit for private enterprise would allow the sector to expand, reducing the role of FDI in production investment. It could also assist in reducing the liquidity that has helped fuel China's housing bubble.

This builds on Prof Wang's earlier work on asset bubbles, published in the *American Economic Review* (2012) and *Econometrica* (2013). Asset bubbles, defined as the difference between fundamental value and market value, had previously only been studied on the periphery of economics due to the common assumption that they are driven by irrational behavior that does not lend itself to predictions

and economic modeling. Prof Wang challenged this outlook, theorizing that asset bubbles are in fact driven by sentiments of optimism and pessimism rather than irrationality.

20% of GDP

Accumulated net FDI inflows received by China from developed countries in 2010

He and collaborator Prof Jianjun Miao at Boston University developed a new method to detect asset bubbles, using a structured model in which asset prices are derived from people's optimistic view and linked to real variables, including stock prices and investment in the economy. They used US stock prices from 1985 to 2012 as the starting point. The period covered the bursting of two major bubbles: the

The orange line shows the accumulated net FDI outflows from the US to China as a percentage share of China's GDP; the blue line shows the accumulated net financial capital outflows from China to the US as a percentage share of China's GDP.

internet bust of 2001, and the US housing collapse of 2007. A basket of economic data was analyzed, including stock prices, consumption, investment, hours worked, and the relative price of investment goods.

Prof Wang has also used his theory to analyze the housing bubble in China and the effectiveness of policy to dampen it. This includes assessing the unintended consequences of moves to increase stamp duty and limit purchases to local residents.

"Credit-driven bubbles are very fragile because optimistic belief can turn to pessimism with a slight change in the fundamentals. Asset prices drop, credit gets crunched, lending and liquidity evaporate, and investment and consumption fall," said Prof Wang.

His research has led him to believe that if the bubble bursts in China, the consequences could be more severe than the collapse of the US housing market in 2007-08, making HKUST economists' work in monitoring China's emergence all the more important.