Chapter 5

Is There A Risk in Overvaluing the Role of the Exchange Rate in Global Rebalancing?

Shang-Jin Wei
Columbia University, NBER and CEPR

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CHAPTER 5

Is There A Risk in Overvaluing the Role of the Exchange Rate in Global Rebalancing?[1]

SHANG-JIN WEI

Columbia University, NBER and CEPR

While the inflexible exchange rate regime of China has been said to be a major cause of the global current account imbalances, the intellectual basis for the claim is weak, and the policy attention being given to the issue might pose a risk to the world economy to the extent that it distracts from efforts to find more productive solutions. A systematic examination of the data (Chinn and Wei, forthcoming) finds no strong or robust support for the conventional wisdom that a more flexible exchange regime facilitates a faster current account adjustment. An alternative way to look at China's current account surplus (and the apparent departure of the real exchange rate from purchasing power parity) needs to put more weight on structural factors that underpin China's unusually high national savings rate in recent years. In this regard, one factor that has not been part of the policy discussion, but which could be economically significant in understanding China's savings pattern, is an increasing imbalance in the number of young men relative to the number of young women in the marriage market. As China's sex ratio rises (since the beginning of this century), both corporate and household savings rates rise due to a desire by families with a son and young men to raise their relative wealth so as to improve their chances in the marriage market, in combination with frictions in the financial market (Wei and Zhang, 2011a, 2011b).

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This could produce a simultaneous rise in the current account and a decline in the value of the real exchange rate (Du and Wei, 2011). Other factors that contribute to the rising savings rate in China reinforce this basic mechanism. This perspective calls for different policy actions other than the obsession with the form of the nominal exchange rate regime.

Keywords: global rebalancing, exchange rate regimes, savings, sex ratios, China

JEL Classifications: E21, D91, O24

1. Introduction

One of the seemingly intractable problems in the world economy in recent years has been the global current account imbalance. China and a few other countries have been running large current account surpluses since the beginning of this century, which are matched by persistently large current account deficits in a group of other countries—most notably, the United States. The problem has been identified as a root cause of or a contributing factor to the 2007–09 Global Financial Crisis (GFC), and possibly a ticking time bomb that could lead to a future world economic crisis.

Very commonly, the fixed exchange rate regime of certain surplus countries is understood to be a key cause of the current account imbalance problem. Both official statements and opinion pieces in news media have reinforced such a view. For example, a communiqué of G20 finance ministers and central bankers declared that "an orderly unwinding of global imbalances, while sustaining global growth, is a shared responsibility involving…greater exchange rate flexibility".[2]

These statements are not, however, founded on systematic analysis of actual country experiences. Indeed, it is not difficult to find counter-examples. While Egypt has a relatively rigid exchange rate regime, it has a relatively fast current account convergence. On the other hand, while Japan has a flexible exchange rate regime, it does not have a fast convergence speed. Of course, there is a limit to how much we can learn from individual examples.

2. Exchange Rate Regimes and Current Account Adjustment

Chinn and Wei (forthcoming) sought to address this deficiency by systematically investigating the data for all International Monetary Fund (IMF) member countries. After examining the data in many different ways, we find no support for the notion that countries on a more flexible exchange rate regime robustly exhibit a faster convergence of their current account to the long-run equilibrium.

[2] G20 Communiqué, Meeting of Finance Ministers and Central Bank Governors, 17–18 November 2007, Cape Town, South Africa.

We estimated variations of the following specification for 170 countries over the period 1971–2005:

$$ca_{it} = \rho_0 + \rho_1 ca_{it-1} + \theta_{0j} \sum_{j=0}^{k} regime_{jit} + \theta_{1j} (ca_{it-1} \times \sum_{j=0}^{k} regime_{jit}) + v_{it}, \quad (1)$$

where ca_{it} is the current account to GDP ratio for country *i* in year *t*, and the variable *regime* is the *de facto* exchange rate measure, proposed by either Levy-Yeyati and Sturzenegger (2005) or Reinhart and Rogoff (2004).[3] As is standard in the international finance literature, the speed of current account convergence can be inferred from the AR(1) coefficients.[4] (As an extension, we allow for both country fixed effects and year fixed effects; this does not alter the basic conclusion of the paper.)

In Tables 1a and 1b, we separate countries into different groups based on a combination of two criteria: a country's stage of economic development (income) and its nominal exchange rate regime. The nominal exchange rate regime classification is per Levy-Yeyati and Sturzenegger (2005). The most salient feature is the lack of a clear sign that more flexible regimes provide faster current account adjustment. In Table 2, we pool all countries together. The same conclusion emerges.

[3] We have also employed the *de jure* index based upon the IMF's *Annual Report on Exchange Arrangements and Exchange Restrictions* instead of the *de facto* measures. The results indicate no systematic relationship.

[4] We check for higher-order auto-regressive terms, and find that an AR(1) is sufficient for the annual data. The sole exception is for the category of non-industrial countries (and non-industrial ex-oil exporters) under a fixed exchange rate regime. In that case, the second lag is typically statistically significant. The pattern of persistence, however—as measured by the sum of the auto-regressive coefficients—is unchanged relative to the baseline specification.

Table 1a. Current Account Persistence by Country Sample, by Regime

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	All					Industrial countries		
	Floating	Dirty float	Dirty/crwl	Fixed	Floating	Dirty float	Dirty/crwl	Fixed
CA(-1)	0.630	0.762	0.788	0.735	0.867	1.060	0.893	0.929
	(0.111)***	(0.068)***	(0.065)***	(0.030)***	(0.044)***	(0.066)***	(0.120)***	(0.033)***
Constant	–0.010	0.002	–0.006	–0.012	–0.001	0.003	–0.001	0.000
	(0.004)***	(0.003)	(0.003)**	(0.002)***	(0.001)	(0.003)	(0.004)	(0.001)
Observations	769	278	388	2,125	209	50	35	279
Adjusted R^2	0.38	0.55	0.64	0.58	0.71	0.88	0.8	0.78

Note: Robust standard errors in parentheses. Significance levels: * 10 %; ** 5 %; *** 1 %. Dependent variable = CA; exchange rate regimes are based on Levy-Yeyati and Sturzenegger definitions.

Table 1b. Current Account Persistence by Country Sample, by Regime

	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
	Non-industrial countries				Non-industrial countries ex-oil			
	Floating	Dirty float	Dirty/crwl	Fixed	Floating	Dirty float	Dirty/crwl	Fixed
CA(-1)	0.596	0.726	0.781	0.728	0.564	0.717	0.797	0.701
	(0.122)***	(0.078)***	(0.068)***	(0.031)***	(0.133)***	(0.071)***	(0.072)***	(0.039)***
Constant	–0.014	0.000	–0.007	–0.014	–0.016	–0.001	–0.006	–0.020
	(0.005)***	(0.004)	(0.004)*	(0.002)***	(0.006)***	(0.004)	(0.004)	(0.003)***
Observations	560	228	353	1,846	529	209	331	1,579
Adjusted R^2	0.34	0.5	0.62	0.57	0.33	0.49	0.65	0.51

Source: Chinn and Wei (forthcoming), RESTAT.

Note: Robust standard errors in parentheses. Significance levels: * 10 %; ** 5 %; *** 1 %. Dependent variable = CA; exchange rate regimes are based on Levy-Yeyati and Sturzenegger definitions.

Table 2. Current Account Persistence, by Country Sample

	(1)	(2)	(3)	(4)
	All	Industrial countries	Non-industrial countries	Non-industrial countries ex-oil
CA(-1)	0.630	0.867	0.596	0.564
	(0.111)***	(0.044)***	(0.122)***	(0.133)***
CA(-1) x LYS1	0.132	0.193	0.131	0.153
	(0.130)	(0.079)**	(0.145)	(0.151)
CA(-1) x LYS2	0.158	0.026	0.185	0.233
	(0.128)	(0.125)	(0.140)	(0.152)
CA(-1) x LYS3	0.105	0.062	0.132	0.137
	(0.115)	(0.055)	(0.126)	(0.139)
LYS1	0.012	0.003	0.014	0.016
	(0.005)**	(0.003)	(0.007)**	(0.007)**
LYS2	0.004	–0.001	0.007	0.011
	(0.005)	(0.004)	(0.006)	(0.007)
LYS3	–0.002	0.001	0.000	–0.003
	(0.004)	(0.002)	(0.006)	(0.006)
Constant	–0.010	–0.001	–0.014	–0.016
	(0.004)***	(0.001)	(0.005)***	(0.006)***
Observations	3,560	573	2,987	2,648
Adjusted R^2	0.57	0.79	0.56	0.52

Source: Chinn and Wei (forthcoming), RESTAT.

Note: Robust standard errors in parentheses. Significance levels: * 10 %; ** 5 %; *** 1 %. Dependent variable = CA; LYS1 is a dummy variable for a dirty-float regime; LYS2 is a dummy variable for a dirty float/crawling peg; LYS3 is a dummy variable for fixed.

To make sure that our result is not driven by a few outliers, Figure 1 plots the distribution of the AR(1) coefficients by country groups, where a country's group affiliation is defined by its nominal exchange rate regime. It is clear from the graph that there is no strong or systematic association between the nominal exchange rate and the speed of current account adjustment.

Figure 1. Individual Auto-Regressive Coefficients (No Trend) for LYS Categories (Higher Indicates More Fixity)

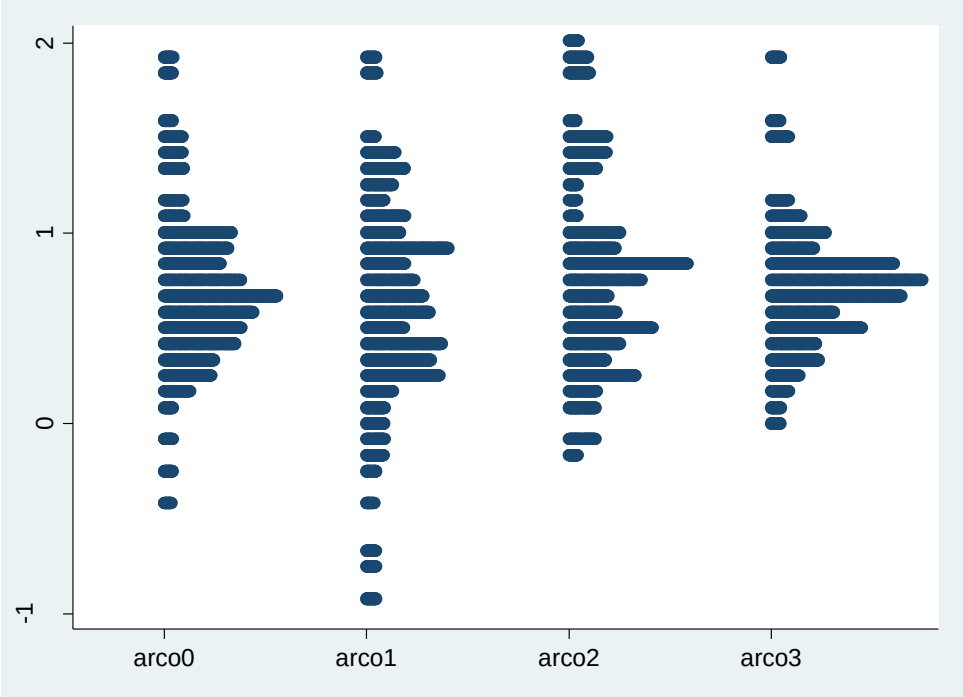
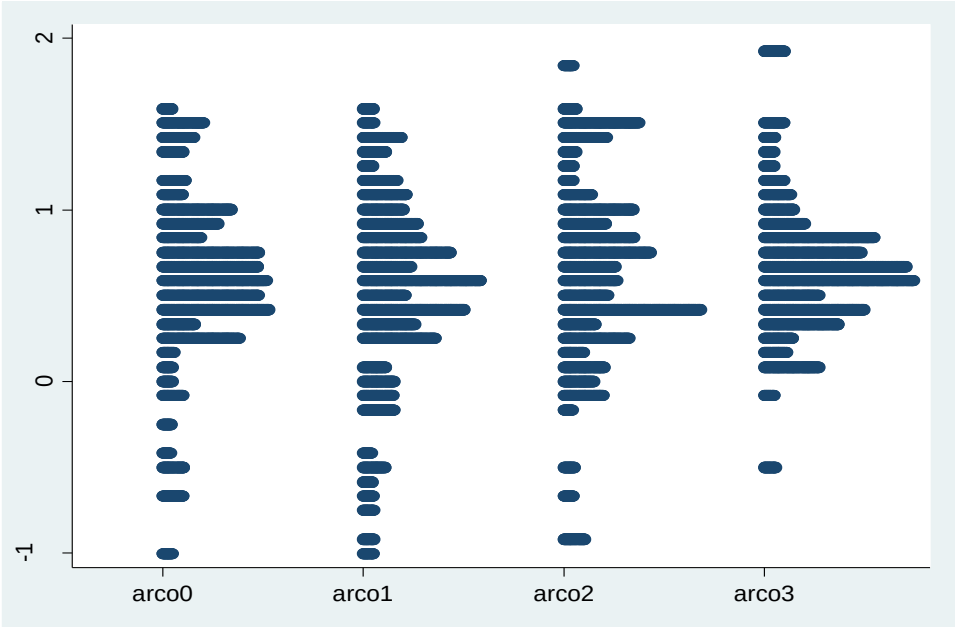


Figure 2. Individual Auto-Regressive Coefficients (With Trend) for LYS Categories (Higher Indicates More Fixity)



Source: Chinn and Wei (forthcoming).

Additional regressions include more controls that might affect current account adjustment. We also deal with the possible endogeneity of a country's nominal exchange rate regime by using instrumental variables proposed by Levy-Yeyati and Sturzenegger (2005). The basic conclusion is the same.

We also replicate the analysis with the Reinhart and Rogoff (2004) classification of exchange rate regimes. The results are reported in Tables 3a and 3b. The qualitative results are the same: there is no robust support for the view that more exchange rate flexibility yields faster current account adjustment.

To understand why this is a sensible result, we have to realize that the current account responds to the real exchange rate, not the nominal exchange rate. A large body of empirical research in international finance shows that the real exchange rate tends to be stationary and converges to the steady state in the long run. The question is whether its convergence speed is connected to a country's nominal exchange rate regime. In Table 4, we examine this connection systematically by following a specification that is similar to the current account regressions. The evidence is clear that the convergence speed of the real exchange rate is not systematically related to a country's nominal exchange rate regime.

In short, the proposition that flexible exchange rates give you a faster adjustment of current accounts is basically wishful thinking, and is not supported by a systematic data analysis.

Table 3a. Current Account Persistence, by Country Sample, by Reinhart–Rogoff Regime

	(1)	(2)	(3)	(4)	(5)	(6)
	All			Industrial countries		
	Floating	Band/crwl	Fixed	Floating	Band/crwl	Fixed
CA(-1)	0.663***	0.799***	0.719***	0.925***	0.840***	0.946***
	(0.0639)	(0.0595)	(0.0455)	(0.0427)	(0.0424)	(0.0417)
Constant	–0.005*	–0.005**	–0.015***	–0.000	–0.001	0.001
	(0.003)	(0.002)	(0.003)	(0.001)	(0.002)	(0.001)
Observations	619	1,275	1,179	204	307	200
Adjusted R^2	0.442	0.666	0.51	0.784	0.663	0.84

Note: Robust standard errors in parentheses. Significance levels: * 10 %; ** 5 %; *** 1 %. Dependent variable = CA; exchange rate regimes are based on Reinhart–Rogoff definitions; "free fall" regime observations omitted.

Table 3b. Current Account Persistence, by Country Sample, by Reinhart–Rogoff Regime

	(7)	(8)	(9)	(10)	(11)	(12)
	Non-industrial countries			Non-industrial countries ex-oil		
	Floating	Band/crwl	Fixed	Floating	Band/crwl	Fixed
CA(-1)	0.621***	0.795***	0.688***	0.656***	0.800***	0.655***
	(0.071)	(0.063)	(0.048)	(0.084)	(0.066)	(0.054)
Constant	–0.007**	–0.006**	–0.021***	–0.009**	–0.007**	–0.026***
	(0.004)	(0.003)	(0.003)	(0.005)	(0.003)	(0.004)
Observations	415	968	979	348	921	905
Adjusted R^2	0.391	0.662	0.47	0.445	0.673	0.431

Source: Chinn and Wei (forthcoming), RESTAT.

Note: Robust standard errors in parentheses. Significance levels: * 10 %; ** 5 %; *** 1 %. Dependent variable = CA; exchange rate regimes are based on Reinhart-Rogoff definitions; "free fall" regime observations omitted.

Table 4. Real Exchange Rate Persistence, by Country Sample

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	All			Industrial			Non-industrial			Non-industrial ex-oil		
REER(-1)	0.797	0.782	0.785	0.624	0.579	0.704	0.803	0.814	0.832	0.779	0.733	0.728
	(0.024)***	(0.056)***	(0.053)***	(0.055)***	(0.103)***	(0.102)***	(0.024)***	(0.054)***	(0.060)***	(0.030)***	(0.043)***	(0.066)***
REER(-1) x LYS1		–0.042	–0.029		0.035	–0.119		–0.063	–0.034		0.001	0.019
		(0.075)	(0.072)		(0.159)	(0.141)		(0.077)	(0.074)		(0.083)	(0.083)
REER(-1) x LYS2		–0.101	–0.115		–0.124	–0.107		–0.120	–0.125		–0.033	–0.068
		(0.111)	(0.106)		(0.152)	(0.159)		(0.110)	(0.106)		(0.095)	(0.096)
REER(-1) x LYS3		0.064	0.093		0.075	0.022		0.032	0.074		0.097	0.126
		(0.083)	(0.073)		(0.104)	(0.095)		(0.084)	(0.076)		(0.099)	(0.094)
LYS1		0.181	0.121		–0.171	0.546		0.280	0.136		–0.002	–0.092
		(0.349)	(0.340)		(0.732)	(0.647)		(0.360)	(0.353)		(0.394)	(0.403)
LYS2		0.450	0.517		0.611	0.518		0.529	0.557		0.140	0.307
		(0.507)	(0.487)		(0.701)	(0.729)		(0.503)	(0.483)		(0.444)	(0.449)
LYS3		–0.248	–0.377		–0.351	–0.106		–0.073	–0.270		–0.366	–0.500
		(0.386)	(0.339)		(0.490)	(0.445)		(0.390)	(0.352)		(0.471)	(0.450)
REER(-1) x												
Trade openness			–0.115			–0.122			–0.130			–0.134
			(0.052)**			-0.135			(0.056)**			(0.057)**
REER(-1) x												
Financial openness			–0.029			–0.055			–0.007			–0.036
			(0.024)			(0.037)			(0.029)			(0.044)
Trade openness			0.359			0.408			0.423			0.410
			(0.212)*			(0.602)			(0.233)*			(0.242)*
Financial openness			0.129			0.267			0.025			0.148
			(0.112)			(0.171)			(0.139)			(0.206)
Constant	0.956	1.001	1.129	1.749	1.957	1.454	0.932	0.840	0.918	1.037	1.205	1.420
	(0.111)***	(0.258)***	(0.255)***	(0.256)***	(0.481)***	(0.462)***	(0.112)***	(0.245)***	(0.295)***	(0.139)***	(0.205)***	(0.333)***
Observations	2,489	1,936	1,728	687	571	515	1,802	1,365	1,213	1,587	1,176	1,024
Number of cn	92	90	88	24	23	22	92	67	66	92	59	58
R-squared	0.64	0.63	0.66	0.46	0.47	0.49	0.65	0.64	0.67	0.61	0.59	0.64

Source: Chinn and Wei (forthcoming), RESTAT.

Note: Robust standard errors in parentheses. Significance levels: * 10 %; ** 5 %; *** 1 %. Dependent variable = REER; LYS1 is a dummy variable for a dirty-float regime; LYS2 is a dummy variable for dirty float/crawling peg; LYS3 is a dummy variable for fixed.

3. The Hidden Source of China's Surplus Problem

The debate on exchange rate flexibility is driven largely by a desire to get China to let go of its exchange rate management. Our discussion would not be complete if we did not dissect the red dragon in the room—namely, the role of the renminbi (RMB) exchange rate in the country's current account surplus.

The Chinese real exchange rate is widely believed to be substantially undervalued. The standard narrative one often hears goes as follows. The Chinese nominal exchange rate is undervalued largely through deliberate and massive government intervention in the currency market. The rapid accumulation of the country's foreign exchange reserve is *prima facie* evidence that the authorities have engaged in massive currency-market interventions. The undervalued currency has in turn created both a growing current account surplus and an increasing departure from purchasing power parity.

3.1. An Alternative Perspective

This narrative is not, however, the only way to piece together the real exchange rate, the current account and the foreign exchange reserve. Du and Wei (2011) investigated an alternative perspective that technology and policy shocks might have triggered a race to raise savings and to work longer and harder. These developments led to a simultaneous decline in the value of the real exchange rate and a rise in the current account (even though the exchange rate is not the cause of the current account surplus). Once the current account is put into a surplus gear, foreign exchange reserve accumulation happens largely passively as a result of the country's capital control regime, which—as with capital control regimes in many other countries—requires mandatory surrender of foreign exchange earnings by firms and households.

The initial technology shock in the new narrative was the spread of ultrasound B machines in China in the 1980s that allowed expectant parents to easily detect the gender of their fetus. The initial policy shock was the implementation of a strict version of the family planning policy. By interacting with a long-existing parental preference for sons, the combination of the two shocks started to produce an unnaturally high ratio of boys to girls at birth from the early 1980s. About 2003, the first cohort born with an

excess number of males was entering the marriage market. The competition for a marriage partner by young men has become progressively more intense since then. In 2007, the sex ratio for the pre-marital age cohort (five to twenty) was about 115 young men per 100 young women. This implies that about one out of every nine young men cannot get married, mathematically speaking.

Why would a rise in the sex-ratio imbalance trigger a significant increase in savings rates? The short answer is that family wealth is a key status indicator in the marriage market (other things being equal). As the competition for brides intensifies, young men and their parents raise their savings rate in order to improve their relative standing in the marriage market. If the biological desire to have a female partner is strong, the response of the savings rate to a rise in the sex ratio can also be quantitatively large.

I would contend that the increased sex ratio has significantly raised both the corporate and the household savings rates in China, and might have indirectly contributed to an increase in government savings as well.

3.2. How Does A Higher Sex Ratio Raise the Corporate Savings Rate?

While it is commonly claimed that the primary driver for China's high corporate savings is mis-governance of state-owned firms (that they do not pay enough dividends to their shareholders), this is an incomplete story. Bayoumi et al. (2010) examined a sample of Chinese listed companies and asked whether, within a given sector, state-owned firms systematically have a higher savings rate. The first column of Table 5 reports an insignificant coefficient on the state-owned enterprise (SOE) dummy, which means that the answer is negative. Some state-owned firms might have a high savings rate because they pay insufficient dividends to shareholders. But non–state-owned firms might also have a high savings rate—probably because they are concerned with access to bank lending and other sources of external financing when they need to invest and expand.

Table 5. Chinese Corporate Gross Savings (As a Share of Assets)

	China firm sample:		*Cross-country sample:*	
	Comparing SOEs with non-SOEs		*Comparing Chinese firms with world average*	
State-owned dummy	0.003	0.027*		
	[0.010]	[0.016]		
State-owned dummy*trend		–0.007*		
		[0.004]		
China dummy			0.0713	0.105**
			[0.0533]	[0.049]
China*Time trend				–0.0092
				[0.0062]
Firm size	0.058**	0.059**	0.223**	0.22**
	[0.018]	[0.018]	[0.075]	[0.08]
Year dummies?	Yes	Yes	Yes	Yes
Sector dummies?	Yes	Yes	Yes	Yes
Observations	6,402	6,402	132,801	132,801
R-squared	0.086	0.087	0.265	0.265

Source: Bayoumi et al. (2010).

Note: Standard errors in parentheses. P-value levels: *** < 1 %; ** < 5 %; * < 10 %. Corporate gross savings rate is Winsorized at the 1 % level; standard errors are clustered at the country level (columns 3–4).

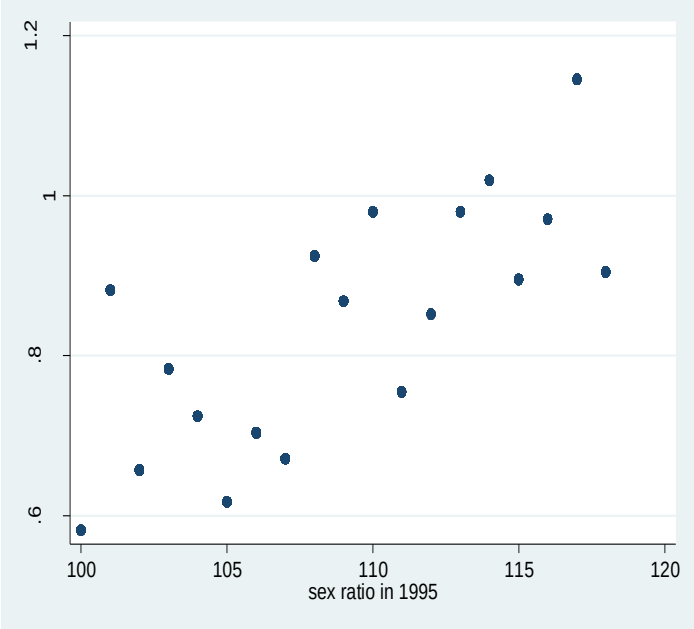
In the second column of Table 5, we examine how the pattern evolves over time by including an interaction term between a time trend and the dummy for SOEs. The result indicates that, in the earlier part of the sample (2000–03), it was indeed the case that SOEs had a higher savings rate. In the later part of the sample (2004–07), however, the reverse is true: non-SOEs tended to have a higher savings rate.

Even though non-SOEs do not have the same kind of corporate governance, their high savings rate can be understood through the lens of the difficulty they face in obtaining a bank loan. This problem is much more severe for newly established private firms that are far from being eligible for listing on a stock exchange. This is where the sex-ratio angle comes in.

A simple decomposition of China's manufacturing growth rate from 1995 to 2004 (using two censuses of all manufacturing firms in these two years) indicates that 70 percent of the growth comes from domestic private firms. A further decomposition of private-sector growth indicates that 70 percent of that comes from extensive margin growth (that is, the formation and growth of new privately owned firms). In other words, the birth and growth of new private firms are a big part of China's growth story. Wei and Zhang (2011b) find that the desire to raise one's relative wealth—which is greatly exacerbated by a rising sex-ratio imbalance—has inspired much more private business formation. In Figure 3, we plot the average growth rate in the number of domestic private firms (for all regions with a common sex ratio) against the local sex ratio. There is a clear and strong positive relationship between the two. This positive relationship continues to hold when we control for other determinants of private business formation, such as local income, education level, initial business development, and the age structure of the local population. Household-level data indicate that families with a son who live in regions with a high sex ratio are more likely to choose to be entrepreneurs (to be business owners or self-employed). Across regions, we estimate that variations in the sex ratio might account for half of the regional variations in the rate of private business formation. The relationship also holds after we do instrumental variable regressions and perform a placebo test. The instruments are regional variations in the financial penalties for violating birth quotas 15 years before and the fraction of local population that is exempted from birth quotas. We can reject the hypothesis that these are weak instruments. We also show that these instruments have a high correlation

with the local sex ratio, and they are uncorrelated with the error term in the main regression. The two stage least square regressions suggest that the relationship is likely to be causal: a higher local sex ratio causes more new private firms to emerge.

Figure 3. Initial Sex Ratios and Growth Rates of Private Firms, 1995–2004



Source: Wei and Zhang (2011b).

Note: On the horizontal axis is the sex ratio for the age cohort five–nineteen in 1995 inferred from the 1990 Population Census. On the vertical axis is the growth rate in the number of private firms from 1995 to 2004, averaged over all counties that had the same value sex ratio (up to a basis point).

Again, since new private firms have concerns about access to external financing, they have to keep most of their profits within the same for reinvestment. As a result, a combination of rising sex ratios and financial market frictions has produced a rise in corporate savings in the private sector.

3.3. How Does A Higher Sex Ratio Raise the Household Savings Rate?

The connection between the higher sex ratio and higher household savings is even more direct. Before we go to that evidence, it is useful to comment on some common misconceptions. Some researchers and opinion leaders contend that the Chinese household savings rate cannot be an important part of China's current account surplus story because: a) Chinese household income as a share of national income has been

falling in recent years; and b) in any case, corporate savings (and also government savings) has shown a strong increase in recent years. I disagree with this contention. First, the household share in national income might well be underestimated due to under-reporting of income for tax-avoidance or evasion purposes. As the range of "gray income" rises over time, the scope for under-reporting of national income might also have increased. Second, even though the Chinese corporate savings rate appears high in an absolute sense, it is in fact part of an international pattern. Bayoumi et al. (2010) formally document this pattern. Columns 3 and 4 of Table 5 present the relevant statistical evidence on this issue. In comparison, Chinese household savings as a share of national savings has no peers in the world. This suggests that, to understand why China's national savings rate is so much higher than other countries, corporate savings is no more important than household savings after all.

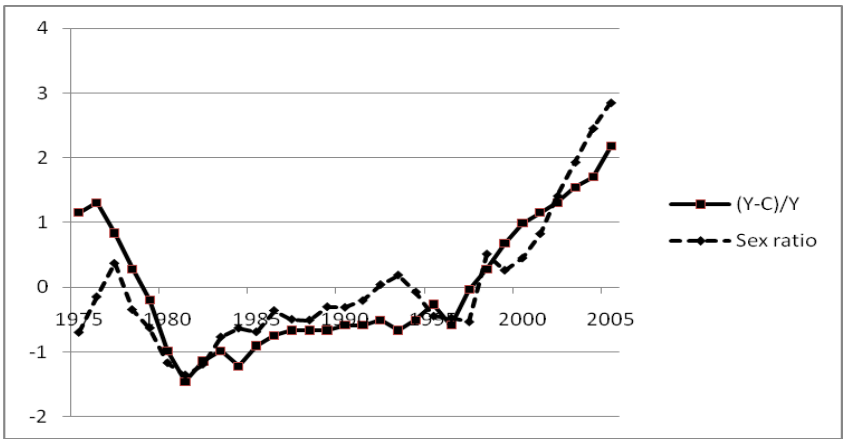
Back to the connection between the sex ratio and the household savings rate: Xiaobo Zhang and I have documented relevant evidence (Wei and Zhang, 2011a). First, across regions in China, those with a higher sex ratio also tend to have a higher savings rate, holding constant the age structure of the local population, income level, social safety net, and other factors. Second, across households with a son, those residing in a region with a higher sex ratio save more (holding constant family income and other characteristics). In comparison, for households with a daughter, their savings rate is uncorrelated with the local sex ratio. The sex ratio effect is significant. While the Chinese household savings rate approximately doubled from 16 percent (of disposable income) in 1990 to 31 percent in 2007, we estimate that the rise in the sex ratio explains more than half the increase in the household savings rate.

3.4. Overall Savings Rate

I have argued so far that the rising sex ratio in China in recent years has been an important factor underlying both a rising corporate savings rate and a rising household savings rate. To the extent that government revenue tends to be plentiful when the economy is growing well, the higher sex ratio has likely contributed to a rise in the government savings rate as well (though we do not have rigorous proof on the last point).

In Figure 4, we import from Wei and Zhang (2011a) a time-series plot of China's national savings rate together with a plot of China's sex ratio for those aged twenty years (or the sex ratio at birth lagged by 20 years, to be precise). The two lines have a striking coherence. Of course, formal regression analysis confirms that the two are highly related.

Figure 4. Sex Ratios and Saving Rates



Source: Wei and Zhang (2011a).

Note: The sex ratio is defined as the ratio at birth 20 years earlier. The saving rate is defined as the ratio of GDP–private and government consumption to total GDP, which is available from the *China Statistical Yearbook 2007*. Both variables have been rescaled by subtracting the mean and dividing by the standard deviation.

Qingyuan Du and I have also examined the connection between local sex ratios and local private-sector savings rates (the sum of household and corporate savings rates) across countries in 2006 (Du and Wei, 2010). After controlling for per capita income, the share of the population enrolled in the social security system, the age structure of the population, and continent dummies, we find that the national sex ratio is a statistically significant predictor of the national private-sector savings rate. This relationship continues to hold if we exclude China from the sample.

As long as the sex-ratio imbalance significantly raises the national savings rate, and the national investment rate does not have a correspondingly large change, a higher sex ratio would produce a higher current account surplus (without any policy actions on the nominal exchange rate front). Du and Wei (2010) have formalized this logic and provided some cross-country evidence that is consistent with this idea.

3.5. The Sex-Ratio Imbalance as a Factor Underlying the Exchange Rate

When the economy-wide savings rate rises, the real exchange rate (defined as the price of non-tradable goods relative to tradable goods) falls. To see this, we note that a rise in the savings rate implies a reduction in demand for both internationally traded goods and non-tradable goods. Since the price of internationally traded goods is approximately pinned down by the world market, this translates into a reduction in the relative price of non-tradable goods, and hence a decline in the value of the real exchange rate.

The high sex-ratio imbalance also motivates people—especially parents with a son—to work harder and longer (in order to create more wealth and be more competitive in the marriage market). As the non-tradable sector is likely to be more labor intensive than the tradable sector, this leads to a faster expansion of the non-tradable sector relative to the tradable sector. This puts additional downward pressure on the value of the real exchange rate.

Putting the two channels together, a rise in the sex ratio generates a real exchange rate that appears too low relative to purchasing power parity (or relative to the standard approach used by the IMF). Of course, other factors also have contributed to an increase in the aggregate savings rate (for example, a rise in income volatility) or an increase in the effective labor supply (for example, gradual relaxation of restrictions on rural–urban migration). These factors would reinforce the Darwinian mechanism discussed here, causing the real exchange rate to fall further and the current account to rise even more.

While the sex-ratio imbalance can induce a current account surplus without currency manipulation, the rises in the savings rate and current account are still socially inefficient. While households raise their savings rates to out-compete other families in the marriage market, the number of men who cannot get married in the aggregate will not be affected by the savings behavior. Therefore, the extra savings (and the associated current account surplus) is socially wasteful. Without an effective mechanism for households to coordinate their actions, however, no individual household dares to unilaterally cut their savings rate or work effort.

4. The Risks of A Misdiagnosis

If the perspective in this paper has some validity then the ferocious fixation of international financial institutions and some G20 discussions might not be the most productive in terms of finding solutions to the global current account imbalances. But is the fixation simply "much ado about nothing", or does it pose risks to the world economy?

In a world with limited staff resources (that is, the world we live in), the fixation on fixed exchange rates becomes a costly distraction for the staff and management of international financial institutions. This happened in the years leading up to the GFC. There was very little effort going into uncovering other potentially systematically important risk factors, such as weak financial regulations, predatory lending practices, and over-accumulation of risks in major financial institutions.

Just before the GFC became headline news, the staffs of international financial institutions were accused of being "asleep at the wheel", for not acting vigorously enough to solve the exchange rate problem. n retrospect, the accusation was misplaced. If these institutions were asleep at the wheel—in the sense of overlooking the danger signs just under their noses—they were essentially overworked by being asked to drive a car on a path that led nowhere.

The fixation on the fixed exchange rate regime poses another risk as governments in both surplus and deficit countries are mentally distracted from finding other ways to deal with structural problems that led to the global imbalances. Of course, this is not to say that a change in the real exchange rate has no effect on current accounts. Rather, a move to a more flexible exchange rate does not reliably move the real exchange rate in the right direction.

If the higher sex-ratio imbalance is a significant reason for the current account surplus then policies that help to reduce the sex-ratio imbalance can also help to narrow current account imbalances over time. Perhaps in future policy dialogue, instead of another push for more flexible exchange rates, it would be more productive to consider social policies—including family planning policies and women's social status in particular—in the context of national savings and current account imbalances. If they start now, they will not solve the global imbalances right away; however, if they do not start now, the world might still be talking about current account imbalances 10 years down the road.

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Table 6. Ln(real exchange rate) and the Sex Ratio, using Private Credit to GDP Ratio as the Measure of Financial Development

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	All countries	All countries	All countries	Excluding major oil exporters	Excluding major oil exporters	Excluding major oil exporters	Excluding major oil exporters
Sex ratio			–4.290**	–4.012**	–3.193*	–3.408**	–3.500**
			(1.667)	(1.713)	(1.797)	(1.568)	(1.754)
Ln(GDP per capita)	0.318**	0.190**	0.236**	0.233**	0.360**	0.402**	0.359**
	(0.030)	(0.038)	(0.041)	(0.044)	(0.073)	(0.063)	(0.073)
Private credit (% of GDP)		0.004**	0.004**	0.004**	0.003**	0.002**	0.002**
		(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Fiscal deficit					–0.007	0.002	–0.005
					(0.009)	(0.008)	(0.009)
Terms of trade					0.0002	–0.001	0.0003
					(0.001)	(0.001)	(0.001)
Capital account openness					0.060**	0.029	0.058**
					(0.027)	(0.024)	(0.027)
Dependency ratio					0.009**	0.010**	0.008*
					(0.004)	(0.004)	(0.004)
Crawling peg (RR)						–0.397**	
						(0.075)	
Managed floating (RR)						–0.036	
						(0.077)	
Free floating (RR)						–0.081	
						(0.119)	
Intermediate (LYS)							–0.078
							(0.092)
Float (LYS)							–0.145*
							(0.085)
Observations	142	132	132	123	92	89	92
R-squared	0.444	0.542	0.564	0.579	0.706	0.801	0.716

Source: Du and Wei (2011).

Note: Dependent variable = ln(RER). Standard errors in parentheses; ** $p < 0.05$; * $p < 0.1$.

Table 7. Ln(real exchange rate) and the Sex Ratio, using Financial System Sophistication as the Measure of Financial Development

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	All countries	All countries	All countries	Excluding major oil exporters	Excluding major oil exporters	Excluding major oil exporters	Excluding major oil exporters
Sex ratio			–6.192**	–6.255**	–5.051*	–4.664*	–4.430
			(1.964)	(1.995)	(2.500)	(2.802)	(2.908)
Ln(GDP per capita)	0.318**	0.480**	0.443**	0.447**	0.529**	0.526**	0.531**
	(0.030)	(0.082)	(0.077)	(0.088)	(0.123)	(0.119)	(0.127)
Financial system sophistication		0.170*	0.252**	0.245**	0.099	0.034	0.086
		(0.089)	(0.086)	(0.099)	(0.110)	(0.121)	(0.116)
Fiscal deficit					–0.022	–0.014	–0.025
					(0.015)	(0.015)	(0.017)
Terms of trade					–0.004	–0.006**	–0.005
					(0.003)	(0.003)	(0.003)
Capital account openness					0.063	0.058	0.073
					(0.042)	(0.047)	(0.047)
Dependency ratio					0.014**	0.017**	0.017*
					(0.007)	(0.007)	(0.008)
Crawling peg (RR)						–0.285*	
						(0.147)	
Managed floating (RR)						0.045	
						(0.102)	
Free floating (RR)						0.053	
						(0.173)	
Intermediate (LYS)							–0.052
							(0.137)
Float (LYS)							0.044
							(0.125)
Observations	142	54	54	49	43	42	43
R-squared	0.444	0.748	0.791	0.797	0.844	0.866	0.845

Source: Du and Wei (2011).

Note: Dependent variable = log(RER). Standard errors in parentheses; ** $p < 0.05$; * $p < 0.1$.

Table 8. Real Exchange Rate Undervaluation and Excess Current Account: The case of China

	% of RER undervaluation					Excess (non-governmental) current account				
	(1)	(2)	(3)	(4)	(5)	(1)	(2)	(3)	(4)	(5)
	Only BS	FD+BS	Add GD +TT+KA	Add DR	Add SR	Only BS	FD+BS	Add GD +TT+KA	Add DR	Add SR
Financial development index										
Private credit (% of GDP)	55.26	43.45	35.44	17.91	7.86	13.52	12.06	11.39	8.97	2.01
Financial system sophistication	55.26	46.38	31.31	16.78	2.24	13.52	10.26	10.11	7.97	0.37

Source: Du and Wei (2001), NBER Working Paper 16000.

Note: Excess RER undervaluation = model prediction – actual log RER (a positive number describes percentage undervaluation); excess current account = private-sector current account (that is, current account net of government savings) – model prediction; the five columns include progressively more regressors: 1) the only regressor (other than the intercept) is log income—a proxy for the Balassa–Samuelson (BS) effect; 2) add financial development (FD) to the list of regressors; 3) add government fiscal deficit (GD), terms of trade (TT), and capital account openness (KA); 4) add the dependence ratio (DR); 5) add the sex ratio (SR). The last two rows correspond to estimates when two different proxies for financial development are used. The first row uses the ratio of credit to the private sector to GDP, and the second row uses an index of local financial system sophistication from the *Global Competitiveness Report*.