

International Division of Labor and Global Imbalances

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The current financial crisis has its roots in global imbalances, but the causes of global imbalances are still a myth and its linkage with the crisis unclear. Although there were discussions before the crisis, the current consensus seems to ubiquitously suggest that the imbalances were caused by the deficit countries' excessive consumption and the surplus countries' excessive savings, and both academics and policymakers are quickly gathering together to propose and plan for the "right" cures, that is, to increase consumption in the surplus countries and to increase savings in the deficit countries. Indeed, some encouraging signs have emerged from the deficit countries; for instance, domestic savings in the United States have increased since the crisis broke out. Taking this as evidence for a turning point for the United States, the largest deficit country, to shift away from excessive consumption, many people begin to doubt whether there is a chance for the export-led growth model of the surplus countries to sustain. After all, if Americans do not want to consume too much, where should the surplus countries, especially China and Japan, sell their products?

The central idea of this paper, however, is that the real cause of global imbalances rests in the long-term economic factors that have shaped the new international division labor that started immediately after the Second World War and has accelerated after the Berlin wall fell. Even a casual glance of the countries on both sides of the imbalance tells a pattern of this new wave of division of labor. On the deficit side, we have United States, Great Britain, and Australia, all of which have adopted the Anglo-Saxon model of capitalism that places finance in the center of the economy. The surplus side is more diverse, but we can still tell a pattern. There are three groups of countries, the old manufacturing giants, namely, Germany and Japan, the newly emerged "world factories", especially China and Brazil, and oil exporters. Because this pattern of division of labor is determined by slowly changing factors shaping countries' comparative advantages, we should not expect that the

imbalances will disappear quickly after the crisis passes away. Most of measures taken by either the international organizations or individual countries, because they are based on wrong or partial understanding of the causes of the imbalances, are not likely to produce long-lasting results. America's rising saving rates will be temporary, and the surplus countries will continue on the export-led growth model, regardless whether they like it or not.

The paper is organized as follows. In Section 1 below we discuss how global imbalances are linked with countries' comparative advantages and provide evidence for it using data of 40 countries for the period 1991-2006. We will also discuss how global imbalances could lead to financial crisis. In Section 2, we present proposals for the international community to correct global imbalances and for the Chinese government to correct China's external imbalances. In Section 3, we conclude by recapitulating several important implications emerging from the paper.

1. International Division of Labor and Global Imbalances

1.1 The story

There are four existing explanations for global imbalances. The first proposes that government deficits in some countries are the causes for those countries' current account deficits. However, empirical studies do not find strong evidence for this explanation (e.g., Backus, Henriksen, Lambert and Telmer, 2005). The second explanation believes that manipulation of the exchange rates by some countries is the cause for global imbalances. For example, undervaluation of a country's currency may lead to current account surpluses in that country. However, this may not be a major cause for global imbalances even if it does have an effect. Germany and Japan have a floating system but both countries have very large surpluses. The third explanation links global imbalances to the different rates of economic growth and different paces of demographic transition in the world (Henriksen, 2005). Countries with higher rates of economic growth have more optimistic expectations for the future and thus consume more today. In contrast, countries with a lower age

dependency ratio tend to have a larger supply of labor and consume less today. The last explanation realizes the importance of the variation of the financial sector in the world. Willen (2004) shows in a theoretical model that a country with a less complete financial sector will save more. Mendoza, Quadrini and Ríos-Rull (2009) also notice the importance of the heterogeneous development of the financial sector. They show in their theoretical model that global financial integration induces countries with more advanced financial sectors to reduce domestic savings and increase international borrowings. An important corollary of their model is that countries with strong financial sectors gain from global imbalances but countries with weak financial sectors lose. However, Chinn and Ito (2009) find in a cross-country panel study that the strength of the financial sector only has explanatory power for developed countries, but not for underdeveloped countries.

Our explanation is an extension of Mendoza, Quadrini and Ríos-Rull (2009). Instead of focusing on the single factor of financial development, we focus on the comparative advantage between finance and manufacturing. In their single-factor model, countries with weak financial sectors lose in global financial integration. In our framework of comparative advantage, all countries gain.

The Anglo-Saxon model of capitalism strongly favors the financial sector. The Harvard economist Andrei Shleifer and his coauthors (La Porta, Lopez, Shleifer and Vishny, 1998) have found strong evidence that the common law countries --- or the Anglo-Saxon countries --- have better developed capital markets than countries with other legal origins. Whether legal origins provide the right explanation is still debatable, but it is clear that the United States and Great Britain are more dependent on the capital market to raise capital and their banking sectors are much more dynamic than in countries like Germany, Japan, and France. That is, the Anglo-Saxon countries have a comparative advantage in finance, and for that reason, they naturally specialize in finance. On the other hand, their manufacturing sectors have experienced deep “hollowing out”.

The old manufacturing giants, Germany and Japan, continue to have

comparative advantages in manufacturing, because they have accumulated strong manufacturing capacities in both physical and human capital. This has a lot to do with the history they have inherited from the first wave of division of labor. At that time, their roles were already cemented in manufacturing goods for the consumption in United States. Their current strengths lie in sophisticated consumer products and intermediate inputs.

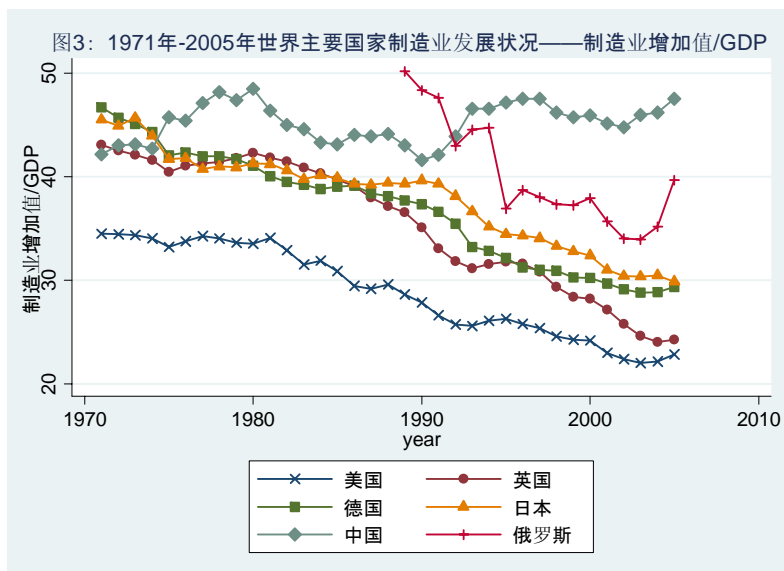
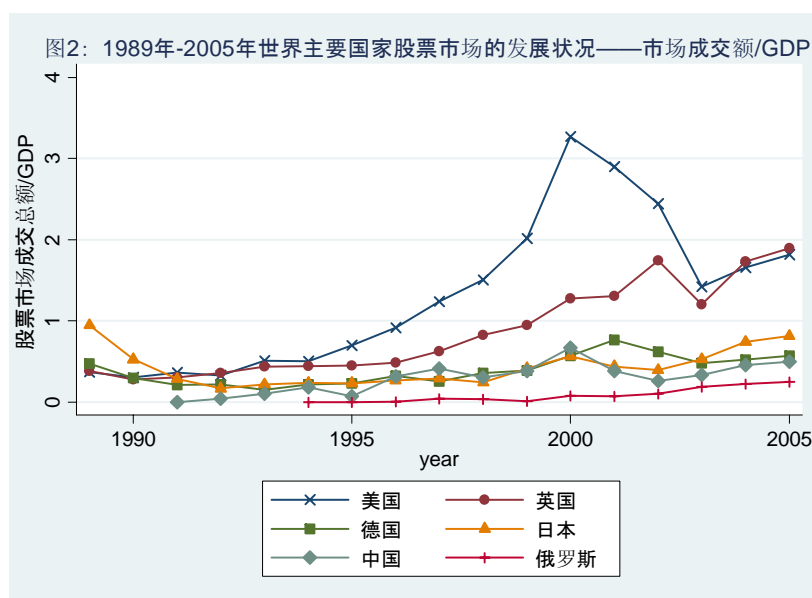
The newly emerged manufacturers like China export mainly low-end consumer products. Their comparative advantages lie in their relatively cheap but educated labor forces. Joining in the world system helps those countries to tap into the potentials of their abundant labor forces. In the case of China, accession to the WTO in 2001 has made a big difference. Between 2001 and 2007, China's exports grew by 28% per annum, compared with 15% in the 1990s. Not surprisingly, China's burgeoning foreign exchange reserves also began to build up in that time period. Looking India from the lens of China, though, often leaves people puzzled. India has similar demographics as China's, but India's current account registers deficits. However, this may be caused by India's reluctant embrace of globalization. India has more restrictive labor market regulations than China, and Indian intellectuals are more critical on globalization than their Chinese counterparts. Indeed, if we trace both countries' trade dependency ratios --- that is, the ratio of trade divided by GDP --- against the years since their respective reforms began, we find that India has followed closely China's trajectory of opening to international trade.

The oil exporters have traditionally provided oil dollars to the United States. These countries have small manufacturing sectors, but their oil income is more than enough for them to import consumer goods. What is surprising is that in the last decade Russia has joined the rank of these countries. Being a traditionally strong manufacturer has not immunized Russia from being captured by the Dutch disease. Its economy has been singularized and its inflation rate has seldom fallen to single digits.

In summary, this round of globalization has a strong tendency to specialize

countries in specific economic activities at which individual countries enjoy comparative advantages. This is evident in Figure 1 and Figure 2. Figure 1 shows the amounts of stock market transactions divided by GDP in several major countries; Figure 2 shows the shares of manufacturing in GDP in those countries. Clearly, the United States and United Kingdom have larger capital markets and smaller manufacturing sectors, and China, Germany, Japan and Russia have smaller capital markets and larger manufacturing sectors.

Figures 1 and 2



Then, why does specialization lead to imbalance of payments with some countries having net surpluses and others having net deficits? Economic theory predicts that normally a surplus country would enjoy an increase of wealth, so it would import more and its current account would end up with being roughly balanced again. Economic theory also predicts that normally a deficit country would face high interest rates and would cut borrowings and rebalance its current account. But in reality we have observed persistent imbalance on both sides.

It has a lot to do with the pattern of specialization we've just seen. It is not a coincidence that none of the surplus countries has a highly developed financial market. They specialize either in manufacturing or in oil exporting. That is why the "manufacturing" of finance is concentrated in New York and London. Like other activities, finance also finds its way to concentrate in places where it is done in the most efficient way. As a result, hard-earned money flows from the surplus countries to the deficit countries. That is, the financial markets in the surplus countries are incapable to channel savings earned on exports to domestic investment or consumption. This observation has an ironic implication for the current debate which often lays blames on the American financial market for causing the financial crisis. While the American financial market may be too fluid, the financial markets in the surplus countries are too static.

However, there is still one question left unanswered: how can current account deficits be sustained in a deficit country? Put in another way, how can a country consume more than it produces for a long period of time without violating its inter-temporal budget constraint? This is the so-called "dark substances" question. Here we would like to propose one kind of the "dark substances". This is the wealth effect of consumption caused by optimistic expectations for future income growth. Although the liquidities flowing to the deficit countries are not real wealth, they do have the effect to increase those countries' real wealth by suppressing the interest rates. Both the real economy and the prices of financial assets grow faster under cheaper credits. As a result, people consume more than they produce today.

1.2 Empirical evidence

In this section, we present evidence for our theory. We collect data of 40 major countries for the period 1990-2006 and study how the comparative advantage of finance over manufacturing affects a country's current account surplus (deficit). Our data sources include Penn World Table, World Bank Development Indicators, IFS, and Beck (2006). One of our innovations is to create an index measuring the relative strength of finance over manufacturing in a specific country:

$$CAI = \frac{\text{capitalization of the capital market}}{\text{value-added of manufacturing}}.$$

Here the capitalization includes the values of stocks, bonds, and debts. We have data for CAI for each country in each year. Then we estimate the following fixed-effect panel model:

$$(1) CA_{it} = \alpha + \beta \ln CAI_{it} + \delta X_{it} + f_i + f_t + u_{it}.$$

In the model, CA_{it} is the ratio of country i 's current account surplus to its GDP in year t ; CAI_{it} is its comparative advantage index in that year, X_{it} is a set of control variables; f_i and f_t are country and year fixed effects, respectively; and u_{it} is an i.i.d. error term. In X_{it} , we have included variables to account for the predictions of other theories including the degree of currency undervaluation, the rate of GDP growth, and age dependency ratio. The degree of currency undervaluation comes from Rodrik (2008).

Table 1 presents the results of several regressions based on model (1). In FE_1 we only include $\ln CAI$ as the explanatory variable. The result shows that doubling a country's comparative advantage of finance over manufacturing will lead to an increase of 3.3 times in the share of current account deficit in a country's GDP. This is a very significant effect, but is smaller than what has been observed in the United States. Between 1991 and 2001, its CAI index increased from 8 to 12, or by 50%, but its current account deficit increased from 1% of GDP to more than 3% of GDP.

Table 1. Panel Estimations Based on Model (1)

	FE_1	FE_2	FE_3	GMM
Logarithm of <i>CAI</i>	-3.30*** (-0.52)	-2.99*** (0.48)	-2.95*** (0.47)	-1.23*** (0.34)
Logarithm of currency undervaluation index		11.43*** (1.09)	11.38*** (1.06)	6.64*** (0.77)
Growth rate of real per-capita GDP (%)			-0.17*** (0.04)	-0.35*** (0.03)
Age dependency ratio (%)			-0.17*** (0.06)	-0.08* (0.05)
Lagged dependent variable				0.61*** (0.03)
Country dummies	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes
Sample size	556	499	499	442
R ²	0.18	0.35	0.39	

Notes: (1) The dependent variable is the share of current account surplus in GDP. (2) Currency undervaluation index takes values in [-4, 5]. Positive values indicate undervaluation, and negative values indicate overvaluation. (3) *, **, and *** indicate significance at the 10%, 5% and 1% significance levels, respectively.

In FE_2 we added the currency undervaluation index (in logarithm), and in FE_3 we added the other two control variables. All the three variables have significant estimates, all of which also have the expected signs. In particular, the estimates for currency undervaluation are large. If undervaluation increases by 100%, the share of current account surpluses in GDP increases by more than 11 times. However, most countries have small values of overvaluation if they overvalue their currencies at all.

The last column presents the results of the GMM estimation with the lagged dependent variable added. Except the GDP growth rate, the magnitudes of the estimates have all dropped but remain significant. However, the estimate for the lagged dependent variable is large; by its value, the long-run effect of each variable should be increased by a factor of 2.5 times. This will basically raise the effect of *CAI* to the levels found in the FE estimations.

Strictly speaking, our definition of *CAI* does not reflect the comparative

advantage between countries because it is only defined for one country. To correct it, we define the following index using the United States as a reference:

$$\widehat{CAI}_{it} = \frac{CA_{it}}{CA_{US,t}}$$

It measures country i 's comparative advantage of finance over manufacturing with respect to the United States. Then we study how this measure affects a country's trade surplus with the United States. The specification is still the one defined in Model (1). Now the dependent variable is country i 's trade surplus with the United States divided by its own GDP, CAI_{it} is replaced by \widehat{CAI}_{it} (still in logarithm). In addition, the currency undervaluation index is replaced by a country's real exchange rate (RER) with the US dollar (direct price) because the index does not measure bilateral undervaluation well. The other two variables are redefined as relative values with respect to the United States. The results of three regressions are shown in Table 2.

Table 2. Finance-Manufacturing Comparative Advantage and a Country's Trade Surplus with the United States

	FE_1	FE_2	GMM
Logarithm of \widehat{CAI}_{it}	-1.62*** (0.23)	-1.63*** (0.23)	-1.74*** (0.21)
Logarithm of RER		0.23*** (0.06)	0.06 (0.06)
Per-capita GDP growth rate relative to the US			-0.03 (0.02)
Age dependency ratio relative to the US			-0.30*** (0.03)
Lagged dependent variable			
Country dummies	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes
Sample size	567	514	508
R ²	0.26	0.29	0.41

Notes: (1) The dependent variable is a country's share of trade surplus with the United States in its own GDP. (2) *, **, and *** indicate significance at the 10%, 5% and 1% significance levels, respectively.

The first two regressions are standard FE estimations, one with only the comparative advantage index and the other with RER added. The last regression adds other control variables and is estimated by GMM. Most of the results are qualitatively the same as those shown in Table 1 although RER and per-capita GDP growth rate are insignificant in the GMM regression.

Table 3. Factor Contributions to China's Trade Surplus with the United States:
2001-2004

Factor	2001	2002	2003	2004
Finance-manufacturing comparative advantage	53.26%	47.70%	44.53%	41.17%
RER	1.88%	1.69%	1.59%	1.42%
Per-capita GDP growth rate	-3.33%	-3.05%	-2.05%	-1.25%
Age dependency ratio	22.95%	23.07%	24.33%	24.41%
Unexplained factors	25.24%	30.59%	31.60%	34.25%

Notes: The short-term estimates of the GMM regression are applied in making the calculations.

Using the results of the GMM regression, we assess the relative strengths of different factors in contributing to China's trade surplus with the United States between 2001 and 2004. The results, presented in Table 3, are very illuminating. First, 40 to 53 percent of China's trade surplus with the United States can be attributed to its comparative disadvantage of finance over manufacturing (or comparative advantage of manufacturing over finance) relative to the United States. Second, another 22 to 24 percent of the surplus can be explained by China's advantage of lower dependent burdens relative to the United States. Third, the contribution of the RER has never been larger than 2%, and the contribution of per-capita GDP growth is also small. That is, about two thirds of China's trade surplus with the United States can be explained by the two long-term factors defining the two countries' finance-manufacturing comparative advantages and demographics. This conclusion has major implications for policies aiming at reducing global imbalances and China's trade surplus with the United States.

1.3 Global imbalances and the financial crisis

The last two sub-sections show how global imbalances come into place. However, if the financial markets in the deficit countries, particularly United States and Great Britain, could properly digest the “excessive” supply of money from the surplus countries, then imbalance would not have mattered. It would have even disappeared. In a frictionless world, i.e., a world free of cross-border restrictions and endowed with strong legal protections and able actors who have all the relevant information to make the right decisions, we should have seen that banks in Wall Street open subsidiaries in Germany, Japan, China, and Russia, so those countries do not need to export their hard-earned surpluses. Of course, the world is full of frictions so we end up with the imbalance. However, imbalance did not necessarily lead to the financial crisis. If the American financial market had not been overly concentrated in the housing and commodity markets, there would have been no asset bubbles and there would have been no crisis. There seem to be numerous opportunities for high-return investments in other parts of the world. For example, investing in infrastructure in Africa and India should be profitable in view of the low quality of infrastructure over there. Unfortunately, the financial sector is the most sensitive industry in terms of demands for legal protection and information so, surprisingly, it is the most home-biased industry despite its fluidity. Bankers prefer doing their businesses at their home countries where they feel easy with the legal system. It is not an accident that the deficit countries have the best legal framework for financial market development. As a result, money flows there and mostly stays there. Unfortunately, there are not that many new technologies or other productive activities to invest in those countries. In the end, their financial sectors flourish on creating its own “productive” assets, which are basically assets on paper accumulated on derivatives and other sorts of financial innovations. So the bubbles, and the financial crisis.

2. Policy Responses to Global Imbalances

2.1 Conventional wisdoms

The crisis seems to have reached its bottom and there seem to be lights at the end of the tunnel signaling for a recovery. However, there will be no corrections for global imbalances even if the world economy recovers. We will quickly go back to business as usual. The proposals currently put on the table are not going to offer the cure.

Many people point figures on the inflexible exchange rate regimes in some surplus countries, particularly China. However, our empirical results show that the exchange rate is only a minor contributor to global imbalances. Germany and Japan both have a floating regime, but both countries run very large surpluses. In particular, Japan has remained a strong exporter despite the Plaza Accord forced the Yen to float and revalue. China's own experience since 2005 also rejects the claim. Between 2005 and 2008, RMB appreciated by about 20%, but China's trade and current account surpluses both surged.

The proposal to replace the US dollar by an international currency will not work either, at least not in the short run. Even all the goods and services were denominated in the international currency, or any other currency, for that matter, the fundamental forces determining the international division of labor would remain and global imbalances would continue. The role of the dollar dominance is to concentrate the excessive liquidities to the US market. In the long run, liquidities will probably disperse to other countries if the position of the dollar is weakened. However, we have to realize that the strong dollar and the strong American financial system reinforce each other. That is, the dollar will be likely to remain strong as long as the American financial system still leads the world. Since there are no signs, even after the financial crisis, that the American financial system is going to become weaker relative to other countries, we should not expect the dollar to become substantially weaker either.

Another mainstream proposal is for the surplus countries to increase consumption. But the chances for it to work are small. Most of the growth of savings in the surplus countries has been contributed by corporate profits and government

revenues although residential saving rates remain high there. The problem is not so much of a lack of residential consumption than of a lack of corporate investment and government spending. The Chinese government is being urged to spend more on social security and health care. While this will have a direct effect on government spending, the Chinese government has to be careful not to over-commit itself to social security and health care. Public money becomes cheap at a time of fast economic growth and thus fast growth of government revenues, which often leads governments to over-commit in public spending. Japan and the United States are two examples. In addition, the induced residential consumption should not be exaggerated. Both Germany and Japan have good social security and health care systems, but residential consumption in both countries is still relatively low, especially when it is compared with other industrialized countries.

If the adjustments in the surplus countries are unlikely to happen or at least take time to happen, we cannot expect that the adjustments in the deficit countries happen quickly either. Money is still going to be cheap and borrowing is still optimal to finance consumption.

In the end, economics wins the game. Unless we reject free trade and free flow of capital and the division of labor associated with them, we will have to live with global imbalances for quite a long time. The problem facing us is not to correct the imbalance, but how to neutralize its negative consequences. To do that, we have to realize that either side of the imbalance is incapable of finishing the business on its own. We have to find a global solution.

2.2 Policy recommendations for international organizations

The solution for the international organizations is to create non-country-specific financial assets and make them sufficiently profitable for the surplus countries to invest in. The IMF's SDR can be such an asset. Most of the world is still very poor and desperately needs investment. If the arrangements are right, this investment can be profitable and the surplus countries will be willing to contribute. In this respect, the

IMF can work with the World Bank to enlarge and strengthen both institutions' current operations to accommodate more contributions from the surplus countries. This round of IMF's capitalization is a good start and should be continued. The recent move of the Asian countries to create an Asian fund is also heading toward the right direction.

In the short run, however, the spread of liquidities to more countries will not reduce global imbalances. Instead, it is more or less like a relocation of the current account deficits from the traditional deficit countries to future deficit countries. However, in the long run, we should see that the level of imbalances to come down. This is because investments in the new deficit countries will enhance those countries' domestic manufacturing capacities and thus reduce their reliance on imports. That is, the reduced deficits in the traditional deficit countries will not be fully picked up by the new deficit countries, and global imbalances will be reduced.

The traditional deficit countries can also act to help reduce global imbalances. For example, they can allow more companies from other countries, including the surplus countries, to be listed in their stock markets, so excessive liquidities can be spread more evenly across the globe.

2.3 Policy recommendations for the Chinese government

China has to undergo serious structural changes in order to reduce its external imbalances. Among them, accelerating the pace of urbanization and reforming the financial sector are the two most critical.

China lags behind in urbanization in terms of its income level. China's current per-capita GDP is 3,400 dollars in nominal terms, and its urbanization rate is 46%. In comparison, the Philippines has a per-capita GDP of 2,200 dollars, but an urbanization rate of 48%. Domestically, agriculture only contributes to 11% of the national GDP, but 40% of the national labor force is in the countryside. If all the rural residents worked in agriculture and the urban-rural income gap were to remain at 3.3 to 1, then China's urbanization rate should be 71%.

Urbanization increases domestic consumption for two reasons. First, urbanization increases people's income and consumption almost for free. Currently, an average urban resident consumes as much as 2.6 times of an average rural resident. Second, urbanization leads to the development of the service sector that is more capable than manufacturing in generating employment. When employment increases, labor income also increases. The share of labor income in GDP has been declining fast in the last decade (Bai and Qian, 2009) and is one of the most important factors leading to China's external imbalances (Yao and Yu, forthcoming). By increasing labor income, urbanization boosts consumption and reduce China's external imbalances.

While urbanization corrects China's external imbalances by reducing China's exports, reforming the financial sector does that by better utilizing the savings accumulated by exports. In recent years, China's trade surplus has reached 9% of its GDP, most of which have accrued to China's burgeoning official foreign reserves. This is a wasteful process. The return on capital in China is over 10% (CCER Research Team, 2007) whereas China's foreign reserves can only get a 2% return on the treasury bills and other bonds in the American market. China's inadequate financial sector should take most of the blames. Two major deficiencies make it incapable of fully utilizing China's national savings.

The first is the lack of small and medium sized banks. China only has 16 major commercial banks and 110 regional banks. There are many rural credit unions, but most of them are running badly. In comparison, the United States has 7,500 commercial banks, 9,900 credit unions, 886 saving and loan associations, and 400 mutual saving banks. One of curious things amidst China's abundance of savings is that small and medium enterprises (SMEs) still suffer the problem of lack of credits. This has a lot to do with China's scant number of smaller banks. Large banks often chase large firms because large firms demand for large loans and save the banks' operational costs. Smaller banks cannot compete with large banks and have to serve SMEs. The lack of credits constrains SMEs' expansion, but SMEs are more efficient

than large firms in generating employment. Therefore, the lack of smaller banks suppresses labor income and contributes to China's external imbalances.

The second is the lack of regional capital markets. Each province in China is a medium or large country in terms of population and territory, but none of them has a functioning capital market. The two national stock markets currently only accommodate about 1,500 companies, a tiny fraction of China's total number of firms. This distorted structure not only hinders the growth of SMEs, but also set barriers for ordinary citizens to share the benefits of fast economic growth. This is particularly relevant for China's lack of corporate bond markets. The Chinese stock market is unusually volatile, very risky for ordinary citizens to invest. For most people, fixed-income assets should be the first choice of investment. Without such an option, many people opt to invest in the informal financial market, facing the risk of frauds.

Reforming the financial sector requires that the government improve its regulatory framework. This will be a daunting task. The government made mistakes in the 1990s when regional capital markets began to emerge. There were many frauds and the government closed all the markets. This time, the Chinese government should not miss the opportunity again.

3. Conclusions

In this paper we propose and test the hypothesis that global imbalances are the result of international division of labor between countries with strong financial sectors (the deficit countries) and countries with strong manufacturing or resource sectors (the surplus countries). Our theory and empirical evidence have strong implications for the literature on global imbalances and the policies trying to correct them. It is worthwhile to recapitulate some of them.

First, there are potentially substantial gains from trade underneath the surface of global imbalances. Both the deficit countries and the surplus countries gain from the division of labor behind the imbalances. Second, since it is determined by long-term factors, the phenomenon of global imbalances cannot be easily corrected

by short-term measures such as adjustments of the exchange rates. To minimize the costs coming with it, international organizations and individual countries must encourage structural changes in the global economy and individual countries. Third, the current emphasis on creating an international currency will not be likely to work as long as the American financial system still leads the world. Fourth, China will continue its export-led growth model in the next decade because of its comparative advantage in manufacturing and its abundant labor supply. To lower the costs coming with this model, China should accelerate its pace of urbanization and improve its financial system to accommodate more banks and regional capital markets.

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