Spring 2011

Sustaining Growth: A Projection of China's Rebalancing Efforts towards Domestic Consumption

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Sustaining Growth: A Projection of China's Rebalancing Efforts towards Domestic Consumption

**Senior Project submitted to
The Division of Social Studies of Bard College**

by

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Annandale-on-Hudson, NY
May 2011

Abstract

According to the macroeconomic identity, combined private sector and public sector balance should match current account balance in any economy. This senior project applies the macroeconomic identity to Chinese data, and analyzes systematically China's economic structure. The analysis finds that China is not as reliant on trade as people normally think despite that the private sector is running a large surplus. Furthermore, it also shows that the private sector can be induced to spend more, and the public sector has much potential to increase deficit spending. Based on these results, I recommend a combination of 10% to 20% exchange rate appreciation, financial liberalization, equalizing tax between trade and non-trade departments, and increasing public spending. The projected outcome of such policy package is that trade surplus and private sector surplus will both decrease, and correspondingly public sector deficit will increase. Such outcome can help China to reduce trade imbalance and ease overheating in terms of overinvestment, thus creating a more sustainable growth pattern that is hinged on domestic consumption.

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Dedication

To teachers and friends who have taught and cared about me at

Bard College!

Acknowledgments

Chapter 1
Introduction and Overview

As the world is slowly and painfully edging out of financial crisis, one thing has become clear: consumers in the West, particularly the US will no longer be the engine for future global growth. Instead, emerging economies have to consume more. This brings our focus onto China, the second largest economy with the world's largest population. Both the international community and the Chinese government have realized the need for China to rebalance towards greater reliance on consumption. While there is little objection that the Chinese government has successfully executed a miraculous growth story on an unprecedented scale, it is much less clear how proficient the regime will be in unleashing internal growth potential.

China's past performance is generally known to fall back on state-led investment in domestic infrastructure and exports. After decades of heavy investment, the effect of diminishing return has rendered infrastructure spending ever less efficient. When it rains, it pours. The untimely outbreak of global financial crisis and the subsequent deleveraging of western consumers shut the other engine of growth. Over-optimistic voices and words of demise about China's future have always existed, but only become more abound now. This reflects the underlying uncertainty China has not faced in at least more than a decade. Standing at the end of the comfortable path where appetite of western consumers

readily absorbs surplus Chinese labor, China now has to find a new path of growth centering on domestic consumption.

Although calls for rebalancing are widely heard from the media and the academia, many questions about China's rebalancing efforts remain unanswered. The most important ones are: how feasible and to what extent could the middle-lower income Chinese citizens stand up to support the country's economic miracle? What is the appropriate level of investment? How quickly does rebalance have to be made? While it is not possible to provide exact answers to all the three questions, my senior project aim to contribute to the literature in two ways. Firstly, I will apply the macroeconomic identity analysis, which has mostly been used on the US economy, to Chinese data. Secondly, I will draw on various studies concerning individual sectors, and piece together a fuller picture that shows the overall state of the Chinese economy. Together, I hope the results will shed some lights on important policy choices for China to maintain its growth.

In the project, considerable effort will be spent on the seemingly simple task of understanding the numbers. In developing countries like China where both the structure of the economy and the reporting methods are rapidly changing, it is always wise to look behind the surface. Many headline numbers we may have seen are misleading. As such, I will pay special attention to explain why the familiar headlines are biased. When data is available, I try to trace the path all the way back to the establishment of the People's Republic of China (PRC) in 1949. Otherwise I will focus on the period since 1978 when economic reform started.

The entire project is divided into six chapters. The remaining of this chapter will give an account of China's past GDP growth path focusing on its sustainability and

introduce the macroeconomic identity. In the next four chapters, I will consecutively discuss the public sector, the external sector, the business portion of the private sector and the household portion of the private sector. The central questions concerning the respective sectors are: China's fiscal policy stance; China's true reliance on trade; possibilities of overinvestment; and the causes behind the striking fall in household consumption as a share of GDP. In the final chapter, I will use results from studies discussed in the preceding chapters to construct three different scenarios and provide policy packages required to achieve the projected growth. It should be noted that the scenarios presented are conditional projections that are different from forecasts. They are meant to show the likely outcomes if the various results to which this senior project is based on turn out to be true.

1.1 The China Story
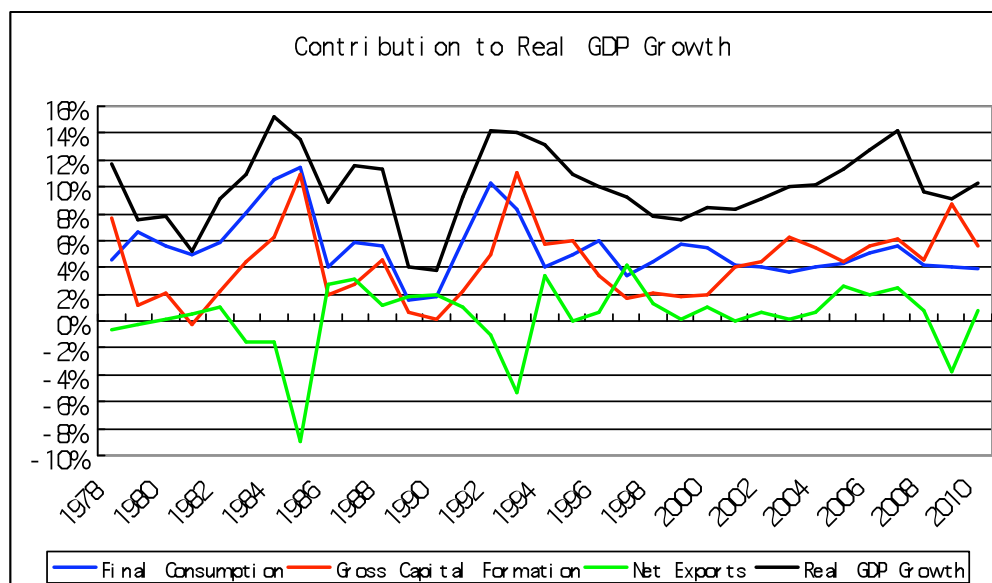
Figure 1: Haver analytics

Starting from the macro data, China's real GDP growth rate has averaged 10.1% for the three decades following economic reform in 1978. Although the number is impressive, it tells us little about what happened. Thus, the first step is to break up the gross figure into different components. By convention of expenditure accounting, GDP growth comes from domestic consumption, investment and net exports. Two figures are plotted: Figure 1 shows the overall real GDP growth rates as well as contribution of each component to growth on a yearly basis; and Figure 2 shows the cumulative weight of each component in the year's GDP.
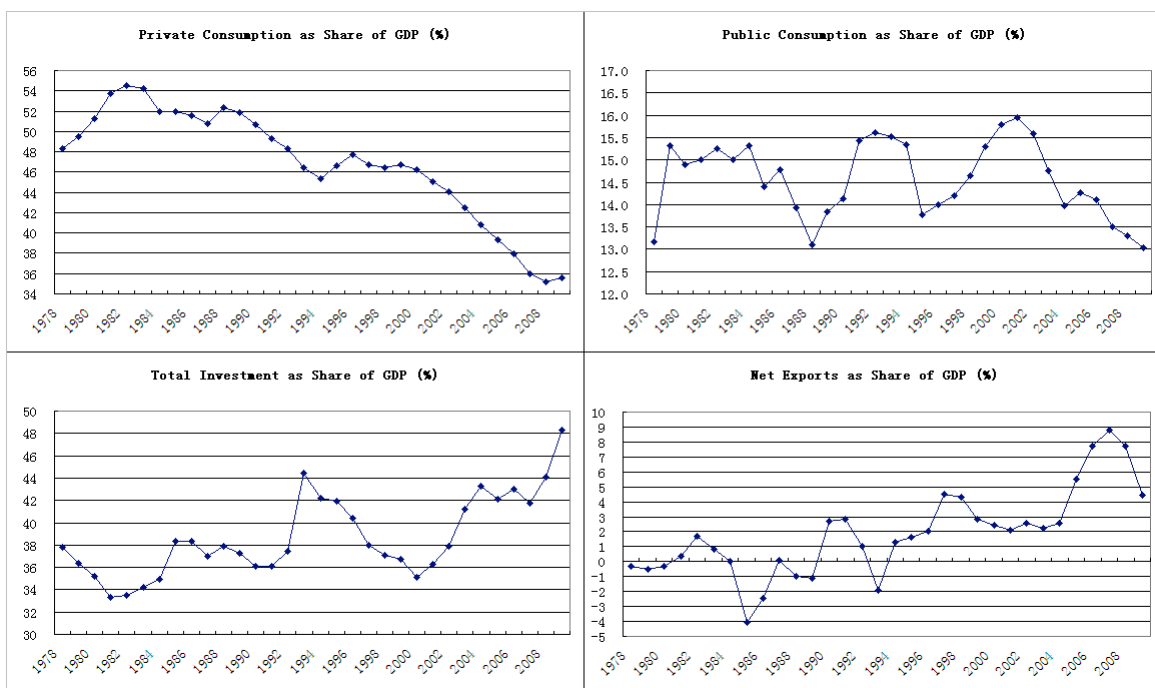
Figure 2: Haver analytics

In Figure 1, the top line shows the real GDP growth rate. In each given year, the three lower lines will add up to give the real GDP growth rate. The figure tells us where the growth comes from, but does not show the absolute weight. For instance, the contribution of net exports to growth in 2008 is about zero. This does not mean that net exports did not contribute anything to GDP in 2008, but it shows that net exports in 2008

is about the same amount as 2007, hence there is no growth coming from net exports. For absolute weight in GDP, we need to refer to Figure 2. It should be noted that absolute weight is different from absolute value. The cumulative weight will decrease if the component is not growing at least as fast as the real GDP growth, which is about 10% a year. On the other hand, if a component is growing at a speed quicker than 10% a year, its weight in real GDP will   increase.

We can see from Figure 2 that private consumption was the most important component of GDP in the earlier years of reform, and from Figure 1 that domestic consumption contributed about two-third of growth. Domestic consumption is made up of private and public consumption. Public consumption has fluctuated within the narrow range of 13% to 16%, varying slightly from year to year s stable as a share of GDP. Thus changes in domestic consumption are mainly due to private consumption changes. As we may observe from Figure 1, the importance of domestic consumption as a growth contributor had decreased since the early years of reform, especially after entering the 1990s. This is also reflected in the dramatic fall of private consumption as a share of GDP. As we can see, after increasing briefly from 48% in 1978 to 55% in 1982, private consumption started the prolong

ed decline all the way to 35% in 2009. As of 2009, total domestic consumption accounted just about half of overall GDP.

Correspondingly, investment took the leading role as the growth driver. In the past ten years, the ratio between investment growth and GDP growth increased steadily from 23.7% in 1990 to more than 40% in mid-2000s and to 95.6% in 2009! Moreover, it is worth noting that the peak of investment growth and the trough of exports growth have

coincided in the past, indicating a conscious effort from the part of investment to maintain GDP growth when exports slipped. Accumulated investment on average makes up about 40% of GDP, and peaked to almost 50% on the last count in 2009.

Based on such breakdown, external sector seems to play an amazingly small role in China's growth story, contributing negatively rather than positively for most of the years. For instance, net export pulled down GDP growth in 1983-1985, 1992-1993 and again in 2009. Cumulatively, net export as GDP share was not significant until 2005, when it began a hike to the peak of 8.8% GDP in 2007. This sharply contradicts our impression of China as an export-led economy because the contribution of net export is both limited and recent. What are more familiar to us may be analysts that use the growth of total exports as a share of GDP growth. Such measure indicates that export growth has contributed on average to almost 40% of the total growth in real GDP since 1990, rising to nearly 60% since 2000.[1] On a cumulative scale, exports also account for 20% of GDP on average since data became available in 1982, and rising to 30% in the mid of 2000s.[2]

We should note that both approaches mentioned above are biased. The size of exports represents the additional boost a country receives from the rest of the world, and imports vice versa. Hence, the net exports value is a clear underestimation of the impact of external sector because directional impact can be crucial for a country although the country may receive no net boost from the rest of the world. Take the example of a country producing only oil and import everything else. The economy will be doomed if foreign demand for oil decreases even though the net trading position is balanced. On the other hand, using pure exports value is an overestimation of China's reliance on external

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[1] John Horn, Vivien Singer, and Jonathan Woetzel, September 2010 , "A truer picture of China's export machine," McKinsey Quarterly
[2] The World Bank country database

sector because the presence of processing trade. In another word, China imports certain intermediate products to assemble into final products for exports. While official trade statistics count the entire value of the final product as exports, China's role in the process actually only involves the value of assembling.

We will show in chapter three that China's exports contain about 50% domestic valued added, making exports contribution to be 15% of GDP. Although this number is significantly lower than we may think, it is still very high for an economy the size of China today when compared internationally. To recap, residential consumption, public consumption, investment and export have contributed 40.9%, 14.5%, 40.8% and 15.0% of the GDP respectively on average for the past ten years. As the average net export is 4.4%, it means China's import will count 10.6% of GDP in order to balance up.

Given this macro picture, it is not immediately clear that there is an urgent need for China to rebalance towards domestic consumption. In order to show the need, I wish to refer to the paper by Guo and N'Diaye (2009). In the study, Guo and N'Diaye try to simulate a growth path where future growth comes mostly from exports. Using the World Economic Outlook (WEO) projection and past experience of Korea, they project an 8.25% GDP growth rate for China between 2009 and 2020, and 5% thereafter. The study assumes that China's domestic consumption grows in line with GDP growth and investment is made to maintain total-factor productivity (TFP) growth at past ten-year average. Under such assumptions, real exports will have to grow at 14.5% during 2011 to 2020 if import elasticity stays at 2001 to 2009 average. This result implies that current account balance will be responsible for 15% of GDP, and China has to take up 20% of world exports by 2040 based on WEO projection for world trade, more than doubling

China's current share. The paper goes further to make assumptions about price elasticity of key industries, identified to be steel, shipbuilding and machinery for China. If these key industries are responsible for the bulk of exports growth, the world price for steel, ship and machine tools have to fall by 45%, 12.75%, and 14.5% respectively to accommodate increased production. Although specific assumptions in the study may be put to debate, the message is clear: reliance on exports for future growth will lead to further price distortion, which have to come from thinner profits, implicit and explicit subsidies, and strained international relations.

If exports expansion is not reliable for sustained grow, it may be questioned whether further investment increases could do the job. Although levels of investment are supposed to be natural market reactions, the large share of State Owned Enterprise (SOE) in the Chinese economy makes it possible for investment to become the last resort growth driver when other engines like exports and consumptions fall short of expectations. This is the widely known "Chinese characteristic" policy induced investment. However, investments as such are not based on profit maximization motives, and their efficiency is put to doubt. Many studies have been done in this area. For instance, Tang, Zhou and Ma (2010) find a positive link between degrees of government intervention in SOEs and levels of overinvestment. As commonly recognized, overinvestment can easily lead to deteriorating health of the banking industry, which is dominated by the Big Four state owned banks. As the Big Four are implicitly obliged to finance non-profitable policy induced investment, China's banking industry is susceptible to overinvestment. I will discuss more about investments in chapter four. For now, since China is already

operating at high level of investment to GDP, it is unlikely that there is much room for further increase.

It may be argued that a combination of further investment and export growth could fuel China's future growth while keeping negative impacts under tolerable levels, hence the regime does not have to rely on boosting domestic consumption. Although this can be true, it is to nobody's benefit that China should continue to distort its structure of growth. Moreover, we have so far ignored possible retaliation from the international community. If China is to follow the distortion path, other countries are surely to react more violently in the future, making the path more difficult to achieve. Therefore, increasing domestic consumption is the mutually beneficial, and perhaps the only possibility for China Miracle to be kept alive.

1.2 Macroeconomic Identity

What have been discussed in the previous section may not sound totally unfamiliar as parts and bits of the discussion may have come across our attention through media coverage. While it helps to set the stage by explaining why residential consumption is the key for China's future, we are much less frequently told to what extent domestic consumption can be increased in a feasible timeframe so that lose from exports and possible decrease in investment can be made up for. We know that domestic consumption is made up of public and residential expenditures. It is certainly true that the Chinese government has plenty of bullets in terms of buffing up public consumption, and I will discuss the public sector shortly. However, even for a government having as much control over the national economy as that of China, it is not possible to force up

residential consumption. In order to know how much residential consumption could possibly increase, we must look at the asset stock and the projected income flow of the private sector as one cannot consume beyond means in a sustainable manner. To do this, I will introduce the macroeconomic identity analysis.

We can break any economy into three financial balances: the private sector balance made up of all households and firms, the public sector balance containing all levels of government, and the current account balance. By the macroeconomic identity of GDP equals gross national income less net income from abroad, we can derive the following equation:

(Savings – Private Expenditure) + (Taxes – Government Spending) – (Payments from Abroad – Payment Made Abroad) = 0

Using common terminology, the above equation can be re-written as:

Private Balance + Public balance – Current Account Balance = 0

A detailed derivation of this equation is included in Appendix 1. As the three accounts balances always add up to zero, unless each sector is balancing itself, there must be certain sectors doing deficit spending while the rest is running a surplus. This analysis reveals important information about financing situations. As good citizens do not go around robbing banks, any deficit spending must be financed. For instance, government deficit can be financed with the issuance of new bonds, current account deficit by foreign

capital inflow, and private deficit by bank loans. Whenever a sector runs a deficit, there must either be building up of debt or running down of assets, both serving to increase the financial risk associated with the sector. On the other hand, a sector constantly returning surpluses has accumulated the power to spend more in the future. In another word, deficit or surplus in each period is a flow, and the asset is a stock. Current stock can be turned into future flow, and past flow is accumulated as current stock. In this manner, we can make estimates about future flows by looking at past flow and current stock. An application of this method of analysis on the US economy can be found in Godley (1999).
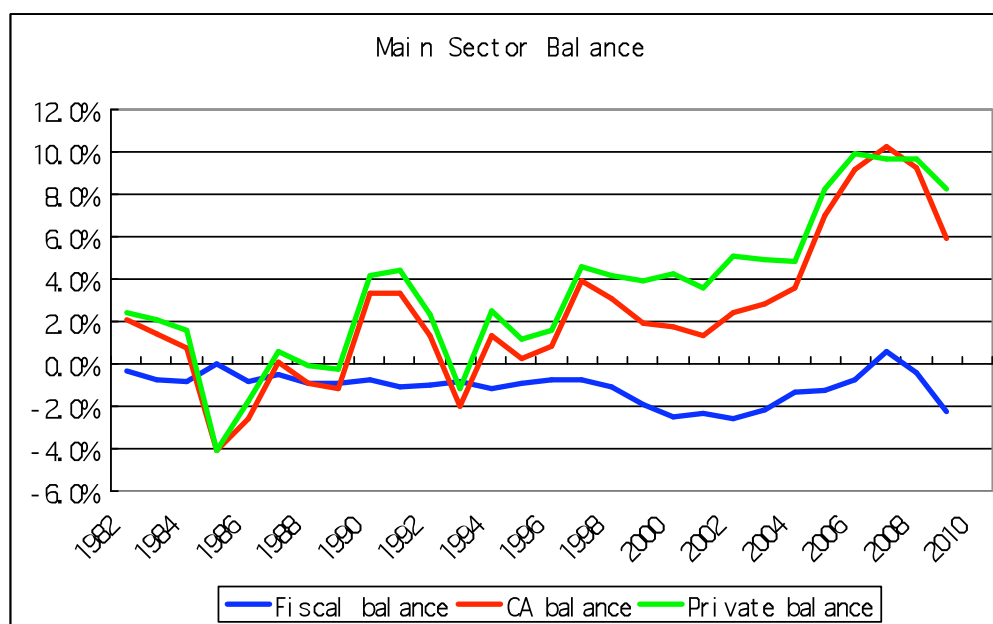
Figure 3: Current account from SAFE; public account from *SYB*

Figure 3 above shows the three account balances for China. The diagram is produced using current account and government account information. The private sector balance is derived from the other two based on the macroeconomic identity. This is because while current account and fiscal account information is standard, much complication arises out of the private account. Hence I will proceed to the discussions and hope they will illuminate a meaningful way to put together the raw private sector

data so that actual values will resemble those theoretically derived ones. As such, I reserve the calculation of actual private sector data to the final chapter. Each balance in the figure is divided by GDP to show its relative weight in the rapidly expanding economy. As the numbers are quoted as deficit, the positive domain in the figure means the sector is running a deficit while the negative domain means there is a surplus. To start, I will first discuss the public sector.

Chapter 2
Public Sector

The raw data on public account is reflected in two ways in China Statistical Yearbooks (SYB), firstly through the government finance section and secondly in the flow of fund (fof) data. Through the government finance section, we can glimpse at the overall fiscal policy by observing total government revenue and expenditure. Through the fof information, we can know where revenue comes from and where expenditure goes as well as net changes in asset position. I will start by describing China's past policy stance.

2.1 Fiscal Policy
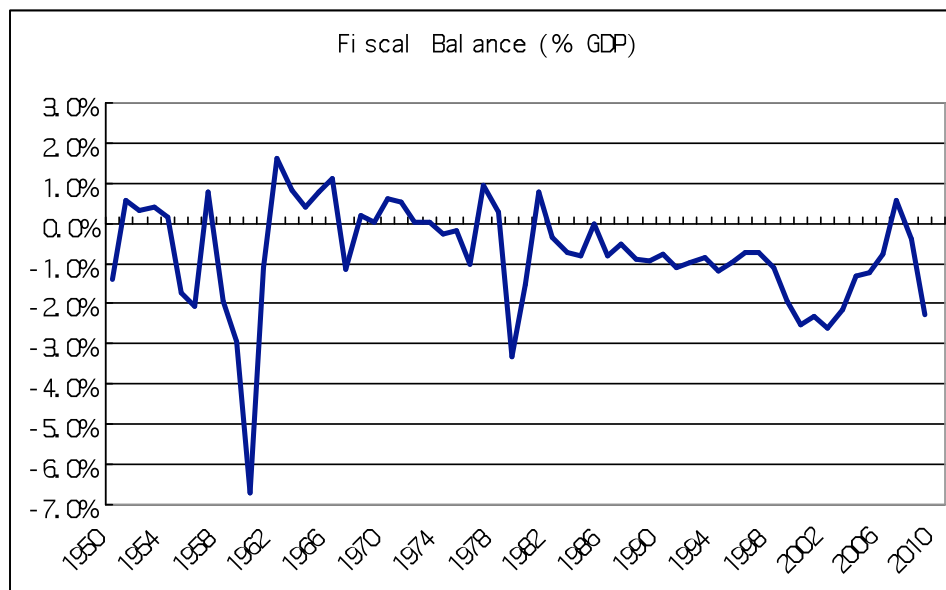
Figure 4: PRC 55 Years Statistics Compilation and China SYB 2010

Using gross revenues minus gross expenditure, the public account balance figure is constructed as shown in Figure 4. The graph here is the same as the fiscal part of Figure 3 though a longer time span is involved. In the figure, we can see that fiscal policies have been very conservative by today's standard throughout the past 60 years since the PRC became independence in 1949. Government budgets were about balanced for most of the time. Even if a deficit did occur, it tended to be only a couple percents of the GDP. This is in sharp contrast to countries like today's US where 5% to 10% government deficits have become the norm. There are both cultural and practical reasons behind the conservative fiscal policies in China. On the cultural side, unless there are situations of emergency or unexpectedness, spending beyond one's means is deemed inappropriate in the Confucius root. Communist doctrine went even further to denounce lending behaviors as the root of all evils. Hence, intentional efforts to minimize government borrowing were evident.

Nevertheless, it is implausible that cultural root was the only impediment behind more aggressive fiscal policies because there were many occasions during the past 60 years when more active inputs from the part of the government were urgently needed. For instance, at the very beginning PRC's independence, the country was lying in ruin after serving as the battlefield for western invasions, WWII and the civil wars. Just like any other countries undergoing post-war reconstruction, China was desperately in need of more proactive government intervention to kick off economic recovery. However, only a small deficit equivalent to 1.4% GDP was run, and the deficit was covered with the issuance of discounted "victory bonds" in the same year. Moreover, a string of surplus

years followed. This is unimaginable for a country that had just gone through more than a century of war destruction.

The practical difficulty for running a larger fiscal deficit was soon to become manifest. The period from 1958 to 1961 was the only time when a significant fiscal deficit was observed throughout the history of the PRC. This is due to the onset of the Great Leap Forward (GLF) program, when over-ambitious economic goals were set. Hence government budgets were expanded to facilitate the required inputs. Deficit spending returned in 1955 and 1956 to about 2%. After a brief dip in 1957, China's fiscal deficit started to soar in 1958. Fiscal deficit was 2.0% of GDP in 1958, 3.0% in 1959 and peaked 6.7% in 1960. Six issuances of "state economic construction bond" during 1954 to 1959 helped to pay for the deficit. Besides, PRC also borrowed heavily from its communist comrades, mainly from Russia and other Eastern European countries.

However, the result of aggressive government spending was high inflation. Under the structure of Soviet-style command economy, the private sector was purposely eliminated or constrained. Hence, domestic demand for government bond was minimal. In order to finance any deficit, borrowing must be done in the international market. It is common knowledge that the world was deeply divided by ideological chasm until the fall of USSR. Hence, China could only borrow from the communist countries since financial ties with capitalist countries were non-existent. Unfortunately, most communist regimes were having bitter financial troubles of their own, including the USSR. Hence, any support China could obtain internationally was very limited. As a result, most deficit spending was financed by issuing currency. As the centrally planned economy is characterized by constant supply deficiency, a larger money supply and hence a larger

claim on limited productions, could easily turn into inflation even if deficit was small at a couple percents of the GDP.

The entire 1960s and 1970s was a period of immense economic difficulty and fiscal asceticism in China. As the over-ambitious GLF policies backfired, China's economy suffered severe setback, contracting more than 27% in 1961 alone based on World Bank data. Externally, Sino-Soviet split was made open, leading to Soviet withdrawal of nearly all technical experts, blueprints and specialists from China. It put a sudden halt on many major projects, resulting in large resources waste. At the same time, China was made to repay Soviet debt. This explains why China had to run a fiscal surplus during the difficult time of early 1960s. When China finally paid off all Soviet debt in 1965, the notorious Cultural Revolution broke out in 1966 and lasted one whole decade to 1976. The subsequent collapse of production activities led to the collapse of fiscal revenues. Despite of the hardship, the Chinese government did not issue any internal or external debt again.

Due to both cultural and practical reasons, deficit spending was not an important tool to stir economic growth during the entire command economy era. Nonetheless, the fiscal asceticism enabled China to enter the reform era without debt burden. Since 1981, the Chinese government abandoned "debt free" policy approach and started to issue internal debt again. During 1981 to 1990, various debts were issued, but the initial impulsion of heavy-handed government stimulation was quickly reversed to more benign deficit of less than 1% GDP. The problem of running large fiscal deficit was again limited financing options. This problem was only gradually solved when private sector was revitalized during the 1980s and China began to cultivate ties with the capitalist

world. In 1993, the central government passed an institutional reform to abolish the conduct of financing fiscal deficit through direct borrowing from the central bank. Instead, the treasury was made to issue government bonds while the central bank could purchase them in the open market. This is similar to the standard practice today.

The timely reform prepared China for the challenge of the Asian Financial Crisis, which run rampant in 1997, topping the Asian miracles one after another. The Chinese government reacted to the crisis by expansionary fiscal policies. Fiscal deficit increased rapidly for six years in a row: 1.1% GDP in 1998, 1.9% in 1999, 2.5% in 2000, 2.3% in 2001, 2.6% in 2002 and 2.2% in 2003. The effect of the reform was clear as the link between public deficit and inflation was cut. During the post Asian Financial Crisis, retail price decreased even though public deficit increased. The two marked peaks in inflation around 1990 were due to market reform rather than deficit spending.

After 2003, government spending kept expanding quickly although deficit level dropped and turned into a surplus in 2007. This was due to an even quicker pace in revenues increase. For instance, stamp duty increased almost ten-fold from previous year due to soaring stock markets and contributed 4.4% of all tax revenue (up from 0.5% in 2006). China's ability to step up government spending during time of need is again proven during the global financial crisis. From 2007 to 2009, public expenditure increased by 23.2%, 25.7% and 21.9% (in nominal terms). The proactive fiscal expansion through the four trillion RMB stimulus package undeniably helped China's rapid recovery from export collapse during the crisis. While the 2010 number is not yet available, a mild public deficit of about 2% is expected to remain for a while as much of the stimulus package was spent on long term projects that require follow up investment.

2.2 Stock and Flow

So far we have only looked at the overall flow figures for China's public sector. In order to know whether such flow is sustainable, we also need to look at expenditure and revenue separately. For this purpose, I will bring in another source, the China SYB fof data mentioned in the opening of the chapter. In constructing the fof data, the economy is divided into five sectors, including non-financial firms, financial firms, household, government and rest of the world. Non-financial firms include all publicly and privately owned for profits firms engaged in the production of goods and services. Financial firms include the central bank, commercial banks, insurance companies and other financial institutional. Governments include all levels of local and central governments as well as non-for-profit government agencies, such as schools. Households include all Chinese citizens and the rest of the world is straightforward. The fof table starts with value added during the production process. For the initial round of income distribution, firms get profits and fixed asset discount value; households receive labor income and governments receive value added tax income. Once this is done, property incomes, which include interests, dividends and rents, are allocated among the sectors. The above two steps make up for initial distribution round. In the redistribution round, incomes are transferred among sectors through social welfare or insurance, and income tax is collected. The income after redistribution is disposable income. A sector can either save or spend its disposable income. While expenditure is used for consumption, saving include both real investment and financial investment. The later is the residue of saving plus transferred income less real investment.

The two tables below are constructed using the fof data. Table 1 shows income items and Table 2 shows expenditure items of the government sector for the period between 1992 and 2008. All numbers are quoted as percentages of GDP. It should be noted that the "government sector" shown in the tables comes from the combined value of "governments" and "financial firms" divisions in the fof data. This modification is made for two reasons. First, China's financial sector is highly dominated by the state sector, and much of the financial sector debt is implicitly guaranteed by the Chinese government. Hence, it is appropriate to treat financial firms as part of the government sector. Besides, the fof definition of financial firms includes institutions like the central bank, which is apparently not part of the private sector. Since we cannot ignore financial firms, it is much more reasonable to attribute them to the public instead of the private sector.

	Value added	Tax and social security	Net property income
1992	12.7%	14.0%	-0.29%
1993	12.6%	14.7%	-0.55%
1994	12.4%	13.3%	-0.56%
1995	11.1%	13.3%	-0.82%
1996	10.6%	15.1%	-0.78%
1997	10.6%	14.9%	-0.58%
1998	11.5%	14.8%	-0.27%
1999	11.3%	16.5%	-0.44%
2000	11.0%	16.4%	0.07%
2001	11.4%	17.6%	-0.57%
2002	12.3%	17.1%	-0.36%
2003	12.4%	18.2%	-0.14%
2004	13.6%	16.4%	-0.41%
2005	11.8%	17.9%	-0.19%
2006	12.3%	18.9%	-0.21%
2007	12.9%	19.5%	-0.51%
2008	14.1%	18.4%	-0.16%

Table 1: China SYB fof tables (numbers are quoted as percent of GDP)

	Wage	Consumption	Capital formation	Transfer	Net asset
1992	6.7%	13.0%	2.4%	3.7%	0.8%
1993	6.7%	12.8%	2.9%	3.8%	0.5%
1994	6.7%	12.4%	3.1%	3.0%	-0.2%
1995	7.0%	11.2%	3.0%	2.7%	-0.2%
1996	7.6%	11.2%	2.9%	3.0%	0.1%
1997	8.0%	11.2%	3.2%	2.7%	-0.3%
1998	9.1%	11.4%	3.5%	2.6%	-0.6%
1999	9.8%	11.7%	3.4%	4.2%	-1.8%
2000	9.1%	11.9%	3.3%	4.7%	-1.7%
2001	9.3%	12.1%	3.5%	5.6%	-2.1%
2002	10.0%	11.7%	3.8%	4.7%	-1.3%
2003	9.4%	11.0%	5.1%	4.1%	1.0%
2004	8.0%	14.5%	5.2%	2.4%	-0.6%
2005	8.2%	14.3%	5.2%	1.2%	0.6%
2006	7.5%	13.8%	5.0%	0.8%	3.9%
2007	7.3%	13.1%	4.4%	0.8%	6.2%
2008	8.7%	13.2%	4.8%	0.9%	4.7%

Table 2: China SYB fof tables (numbers are quoted as percent of GDP)

The two tables reveal some important messages. First, government income as percentage of GDP has been increasing, and the increase is most pronounced under tax and social security, which registered more than 5% jump between early 1990s and late 2000s. It implies that government sector is getting larger in the past ten years. China's government sector used to control the entire economy before 1978 economic reform. After 1978, size of government sector decreased dramatically to make room for the private sector. Hence, the resurgent of government sector share shows that a turning point had been reached in the 1990s.

Second, property income of the government sector is negative. This is due to the fact that SOEs ceased paying dividend to the treasury in 1993 as many of the SOEs were undergoing dramatic restructuring, often incurring heavy losses. In recent years, dividend payments for some profitable SOEs have been resumed, but the percentage is kept low.

For instance, some selected SOEs paid 5% of their profits to the Chinese government, and the rate of dividend payment is gradually increased to 10% or 15% depending on different industries in 2009. The rate of dividend payment is expected to increase to a much higher level in the years to come, hence presenting a large potential income increase for the government.

Third, government saving has been substantial in the past, and a large part of the saving is transferred to firms. This fact is clear if we jump ahead to Table 5, which shows that transfer income of "non-financial firms" almost match transfer expenditure of the government. Understandably much of the transfer was used to help the restructuring efforts of the SOEs. However, as most SOEs have completed the restructuring process and turn profitable again, such transfer expenditure from the government becomes unnecessary. Indeed, transfer expenditure decreased sharply in the later part of 2000s. In conclusion, income flow of the Chinese government is very robust, and there is likely to be much spending power that is yet to be allocated.

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010F	2011F
Gen. Gov. Direct Debt (US$ Bil.)	206.23	238.40	280.91	309.56	381.58	427.66	474.75	573.93	779.39	928.76	1,127.41	1,295.41
Gen. Gov. Direct Debt/GDP	17.6	18.4	19.8	19.3	20.2	18.7	17.1	15.8	17.0	18.6	19.6	19.8
Gen. Gov. FC & FC-indexed Debt/GG Direct Debt	23.8	20.9	18.0	17.1	8.8	7.7	7.2	6.0	0.9	0.7	0.6	0.5
External Debt (US$ Bil.)	152.2	170.1	168.5	193.6	228.6	281.1	322.9	373.6	453.6	458.6	473.6	488.6
Interest Paid on External Debt (US$ Bil.)	9.9	10.2	9.6	11.0	13.7	18.3	24.2	31.8	43.1	48.2	54.5	61.1
Official Foreign Exchange Reserves (US$ Bil.)	165.6	212.2	286.4	403.3	609.9	818.9	1,066.3	1,528.3	1,946.0	2,399.2	2,726.6	3,009.6

Table 3: Moody's Sovereign Ratings Handbook and author's calculation

Besides income flow, cumulative asset position is another important factor to take into account in order to project the future financing situation of the government sector. Table 3 list a number of items regarding the government sector asset position. The first two rows show that general government debt has been constantly lower than 20% of GDP.

This is very low as compared to most other countries, whether developed or developing ones. For the purpose of reference, public debt to GDP ratio is 225% for Japan, 78% for Germany and 59% for the US in 2010 based on the World Factbook data from CIA.[3]

Moreover, most of China's public debt is denominated in local currency. This is seen from the third row, where ratio of foreign currency denominated debt decreased to less than one percent in 2009 and is expected to remain so for some years. When public debt is denominated in local currency, the government faces no liquidity constraint and hence payment difficulty. This is why Japan could maintain a pubic debt more than 200% of GDP for two decades while Latin American countries suffered debt crisis in the 1990s with much lower debt to GDP ratios. As Latin American debt was mostly denominated in the USD, when foreign exchange reserves ran low or fiscal situations turned bad, international investors fled from Latin American debt, selling off their local currencies, leading to depreciation against the USD and hence deteriorating debt position.

Going down the table, fourth row shows the amount of external debt, or debt held by foreigners. As a national government has much more influence over their own residents than over foreigners, a lower ratio of foreign holding indicates financial soundness. At the same time, as government debt is considered the most secure and liquid asset, domestic holding of government debt will enhance the robustness of the domestic financial system. Comparing first and fourth row shows that China's government is shifting towards higher percentage of domestic holding.

Finally, the last two rows are the amount of interest paid on external debt and total foreign exchange reserves. It is widely known that China has the largest foreign exchange reserves in the world, and short term interest payment is obviously not a problem. In fact

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[3] https://www.cia.gov/library/publications/the-world-factbook/rankorder/2186rank.html

the total amount of China's foreign exchange reserves is getting so large that many negative impacts have surfaced. Difficulty to manage such a huge reserve is just one of the examples.

In conclusion, China's fiscal policy seems way too conservative given China's income flow and asset position. Strong financial position of the government sector is a double edged sword. On the positive side, it means that the government has huge potential to safe guard the economy from external shocks. This is well proven during the 2008-2009 global financial crisis. On the reverse side, if the government fails to take adequate action, the government sector is sure to register surplus in the near future. This will push the private sector into deficit. As Chinese household is also running a surplus, which I will discuss later, the entire deficit pressure will fall on firms. This will lead to dangerous outcome as the financing situation of firm sector deteriorates as a whole.

Chapter 3
Current Account

China has been known as an exports-led growth country. In recent years, much has been written about China's rising current account surplus and the importance of its exchange rate policy. In a much cited paper, Goldstein (2007) blames China for failing to allow more rapid RMB appreciation, and justify the position using indicators that have become all too familiar to us: sustained trade surplus; non-appreciating real effective exchange rate (REER); lack of role for market forces; and continued government intervention in the exchange market. The paper further blames China's interest rate policy to be the impediment to smooth banking sector reform, more balanced growth and independent monetary policy while at the same time hurting China's trading partners. On the surface, we are easily swayed into taking a convenient position; and think that the exchange rate policy is the panacea to all China's internal and external problems. In reality, superficial views as such are highly misleading. In order to get a better picture of China's external sector, the first step is to look behind the statistics.

3.1 Exchange Rate and Trade Surplus

I have reproduced China's historical current account balance in Figure 6, which is identical to the current account part of Figure 3 shown earlier. By looking at the

aggregate data, 2001 is the watershed marking apparent current account taking of. This is easy to understand as 2001 is the year when China was officially admitted into the WTO. Before 2001, both surpluses and deficits were registered, but after 2001, there were straight surpluses in a row. Moreover, the magnitudes of surplus both in terms of absolute value and as a share of GDP have shown notable increase. For instance, current account surplus increased from 1.3% GDP in 2001 to the 2007 peak of 10.2%. This is considered to be a high level whether historically or internationally.
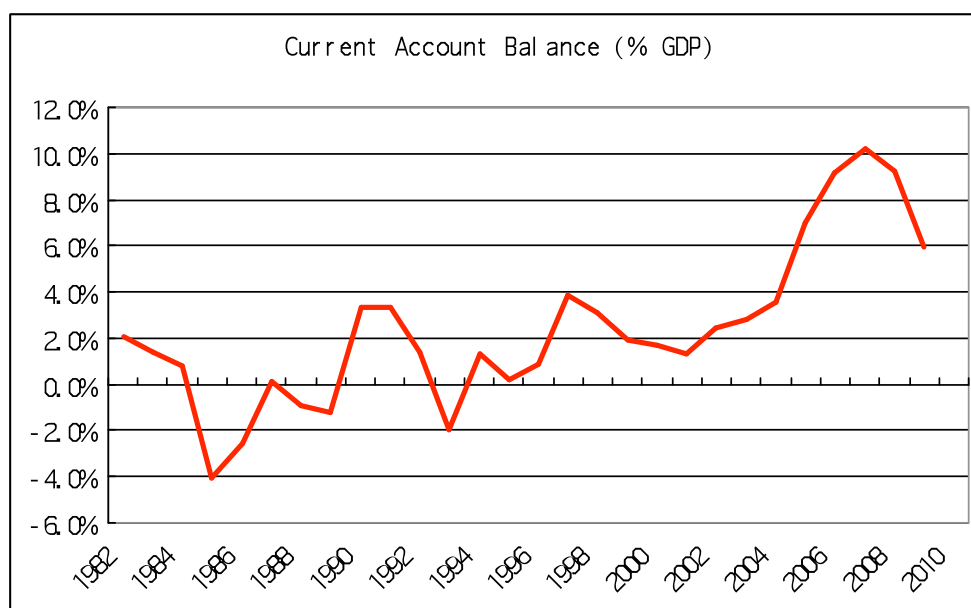
Figure 5: China State Administration of Foreign Exchange (SAFE)

After a decade of rapid trade growth, China has now surpassed both the United States and Germany to become the world's largest exporter.[4] Hence, it is understandable that other countries are concerned about China's growing current account surplus. Lately, mounting pressure has been applied for China to revalue the RMB exchange rate, firstly from the US and later from emerging economies like Brazil. While the hope is for quick and large scale revaluing the RMB to restore international imbalance, the Chinese

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[4] https://www.cia.gov/library/publications/the-world-factbook/rankorder/2078rank.html

authority has categorically rejected such demand, and this is not without reason. Although it is clear why exchange rate has an impact on current account balance, simply assuming that revaluing the RMB will solve China's trade imbalance is not possible. He (2008) refutes the claim that RMB valuation has a large role to play in the building up of current account surplus by presenting two major empirical evidences.

First, the merchandise trade and service trade components of the current account have shown opposite trends with the former going into increasing surplus and the later into increasing deficit. As changes in exchange rates should affect both merchandise and service trade in a similar manner, the opposite trends demonstrate that RMB exchange rate does not have a large impact in both components of the current account. It may be argued that merchandise and service trades may be highly correlated in a negative way so that increasing merchandise exports will require proportional increase in service imports, leading to the observed trend. A closer look at service trade items shows that transportation has been the largest contribution to service trade deficit, hence imparting more plausibility to the counter argument. However, other items unrelated to merchandise trade such as tourism and construction also failed to show clear positive correlation with merchandise trade. Hence, it is at most ambiguous that interest rate changes have influenced both the merchandize and the service trade in a similar manner as it should have.

Second, He (2008) points out that rapid current account surplus increase did not correspond to period of exchange rate depreciation and vice versa. Figure 7 shows the effective RMB exchanged rate index compiled by the BIS. As we can observe from the graph, rapid appreciation of RMB from 1994 to 1998 corresponded to rapid current

account surplus buildup in the same period though the reverse is expected. Further more, the exploding surpluses since 2001 onwards also seem to coincide with rather stable or appreciating RMB exchange rate trend. Hence, it is unconvincing that undervalued RMB value has a large impact in the mounting surpluses. Further econometric tests on data in He (2008) confirm the result of weak or non-existing relation between RMB exchange rate and China's current account balance.
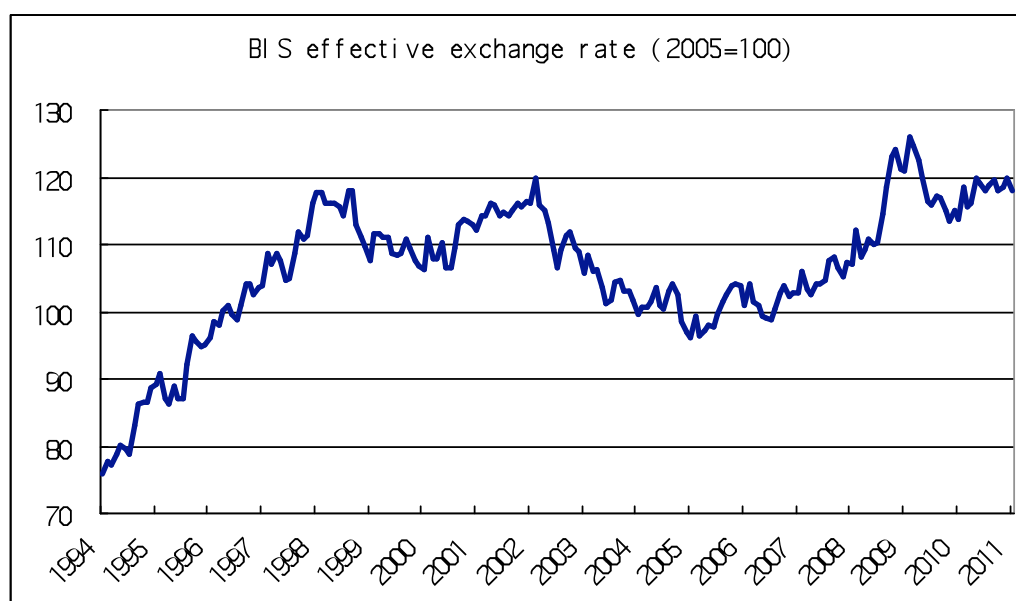
Figure 6: Bank of International Settlement (BIS)

3.2 Trade Structure

If exchange rate, or mere prices changes, is not the main driver of China's mounting current account surplus, we must look deeper for structural reasons. China's trade and custom statistics differentiate exports into general trade and processing trade. In our impression, China is often mocked as a big workshop, where intermediate goods are assembled together for exports. This view is reinforced by a cursory reading of the statistics, which show that more than half of China's total exports today still consist of

processing trade. However, this classification is not a functional one, but rather for tax purposes. A careful look shows that there are two subcategories within "processing" trade. First, processing that is based on contractual agreements with foreign suppliers of inputs and foreign buyers of final products; second processing using imported inputs. Under the first category, firms do not pay import taxes or VAT, while under the second category firms first pay the required taxes and then claim rebates later. It is the first category that conforms to conventional view of processing trade, where the exports are inextricably linked to imported inputs. In the second category, the share of imported inputs can vary arbitrarily, depending on the extents of domestic sourcing.
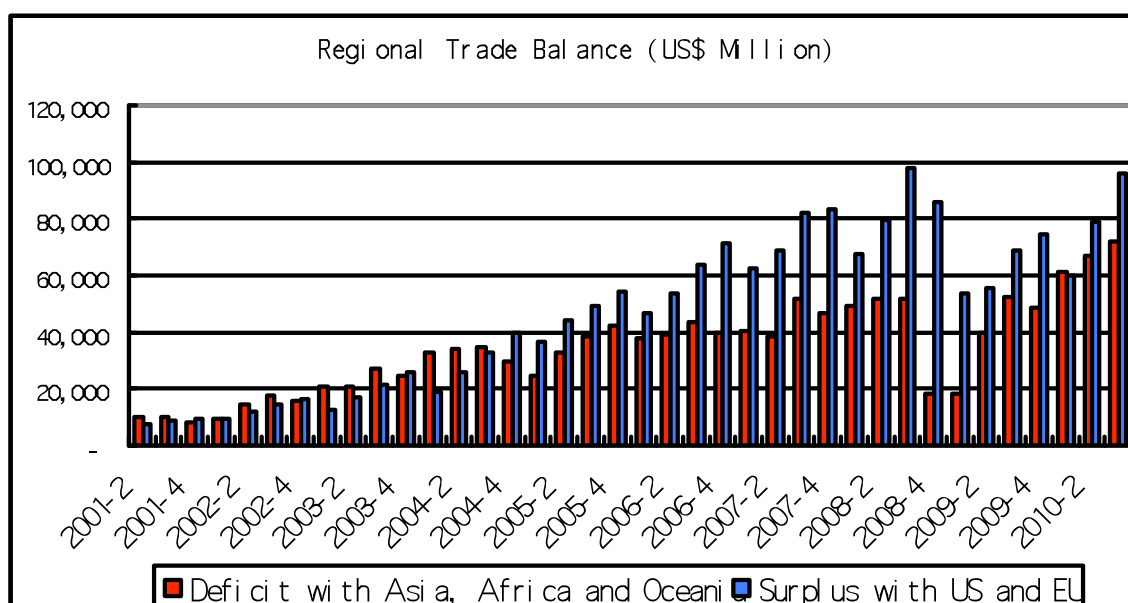
Figure 7: Haver Analytics and author calculation. Asia includes Japan Korea Taiwan and ASEAN

Over the years, China has steadily moved away from simple assembly line based processing trade, adding both domestic content and sophistication. This subtle change is reflected in China's changing regional trade balances. Figure 8 shows China's regional trade deficits and surpluses. In the early 2000s, China's deficits with Asia, and Africa and Oceania largely mirror China's surplus with the West, supporting the caricature that

Chinese labor mixed intermediate inputs from Asia and raw materials from Africa and Oceania to produce final goods sold to the US and Europe. However, this relationship broke down after mid-2000s as China's regional surplus growth outpaced regional deficit growth. The clearest evidence came during the financial crisis when imports totally collapsed while exports lingered on. The implication is that China was able to manufacture most of the exports domestically.

As the exporting department is has evolved over time, we cannot simply use the raw data distinction between general and processing trade as proxy for "domestic content" of China's exports. How dependent Chin really is on exports is an important question for policy choices in dealing with trade unbalance. If reality is what popular headlines put it at 60%, then China should by all means attempt to maintain its edge on trade even at the cost of structural distortion in the short and medium run Otherwise, China may afford to have much more freedom in executing its policies and prioritize other more important factors.

The standard vertical specialization model developed by Hummels, Ishii and Yi (2002) can be used to compute domestic and foreign contents in a country's exports when the country does not engage in any processing trade, and hence deduct "foreign component" from the final exports value. The model is unsuitable for countries engaged in extensive processing trade like China because it assumes that the intensity in the use of imported inputs is the same between production for exports and production for domestic sales. If applied directly, the result is likely to significantly underestimate the share of foreign value added in China's exports.

Improving on the standard vertical specialization model, Koopman, Wang and Wei (KWW 2008) draw on input-output (I/O) literature and create a generalized version of the vertical specialization model. The new model requires both the I/O data, which is used to determine sector-level total imports/exports, and trade statistics to determine the relative proportion of processing and normal exports within a sector. As pointed out earlier that the China Customs distinction between procession and normal exports is for tax purposes, KWW (2008) only use the raw data as an initial "guess value", on which a further optimization based on ten constrains is performed. Using the modified model, and feeding on 1997, 2002 and 2006 published China benchmark I/O tables as well as trade statistics, KWW (2008) estimate domestic component for all China's merchandise exports to be 52.3%, 53.9% and 50.7% for the three data years. The estimates for manufacturing goods are slightly lower at 47.6%, 51.3% and 49.4% in 1997, 2002 and 2006 respectively. Since no clear trend is observable and the results are considerably close, it is convenience to use a generalized rule of 50% domestic value added for all China's exports.

Based on this rule of thumb, China's is 15% dependent on export as we have already discussed in the first chapter. Comparing to Japan in the 1960s and early 1970s, which is the period when Japan's growth was most rapid, exports of goods and services only accounted for about 10% of GDP based on World Bank data, and this figure has not undergone the same exercise of removing "foreign content" like we just did for China. This comparison shows that Japan's growth was much less dependent on exports. Other well-known exports led economies like Korea and Singapore may have experienced similar levels of exports dependency to those of China's today, but these economies are

notably smaller as shares of the world economy than China. The size of an economy and the sustainability of its dependence on exports are closely related because a larger player will alter the world market prices more severely.

3.3 Estimating Trade Elasticity

Given external demand still carries considerable weight in China's economy though not as high as people normally think, we still need to compute the exports and imports elasticity in order to carry out projection exercises. Though some studies have been done to estimate China's exports and imports elasticity, most of them lack a systematic analysis over a time span in recognition that trade elasticity values were unstable in China. In this regard, I refer to Aziz and Li (2007), which make use of both aggregate and disaggregated data and calculate the dynamic change of China's trade elasticity values during the period of 1995 to 2006.

Aziz and Li use the standard reduced form partial equilibrium trade model as the basic analytical framework, where exports and imports are related to real foreign and domestic demand respectively as well as relative prices. The authors added a productivity variable to the exports equation to take into account of rapid productivity gain in China because productivity improvement is responsible for much of China's gains in world's export share. In terms of data, foreign demand is based on IMF's Global Economic Environment Indicator for China's trading partners; domestic demand is approximated by industrial sales; relative export prices come from CPI based real effective exchange rate (REER) as most of China's exports are final goods; relative import prices are aggregated from trade weighted ratios of China's PPI to external prices indices because China's

imports consist of mainly intermediate goods. Finally, the ratio of per capita GDP in China to that in the US is used as a proxy for productivity control variable because there are no reliable employment data in China for compiling labor productivity. Both exports and imports volumes are quoted as USD amount. Quarterly data from 1995 to 2006 is used because of exchange rate system reform took place in 1994 in China, unifying official and market exchange rates.

Using Dynamic OLS method since almost all the series are non-stationary, the trade equations are estimated for the entire sample as well as six rolling subsamples of eight years each, the first sample spans 1995Q1-2002Q4, and the last sample covers 1999Q1-2006Q4. For the full sample, export elasticity to foreign demand is 3.77 and to relative price is -1.55 while import elasticity to domestic demand is 1.12 and to relative price is -0.92. Productivity coefficient is 1.30. As expected, results from the rolling subsamples regression show significant changes over time. Generally speaking, demand elasticity has been more stable than relative price elasticity, and import elasticity is more stable than export elasticity.

In more details, exports demand elasticity started at 3.56, fluctuated in the mid 1990s and rose up towards late 1990s and early 2000s. Exports demand elasticity for the last rolling sample is 4.26. On the other hand, exports price elasticity began at -1.31, declined to almost -3.0 before turning back to -2.00 for the last sample. The fact that China's exports have become more sensitive to both price and demand is largely explained by changes in composition of China's trade, particularly the increasing sophistication of exports and the rising domestic content of processing trade. For instance, the share of exports that are less price sensitive, such as primary products, declined from

14.4n 1995 to 5.3% 2009. In the meanwhile, those that are typically more sensitive to prices, such as machinery, rose from 21.1% to 49.1% during the same period. More details about trade composition can be found from Appendix 2. Besides, continued market reform also increase responsiveness of exporters to market signals.

For imports, demand elasticity stayed put in early periods at around 1.10, but increased slightly to 1.17 in the later sample periods. Import price elasticity showed more variation, declining from 1.03 in the first rolling period to 0.41 in the last rolling period, meaning imports have become less elastic towards price changes. An explanation for the observation is that increased domestic sourcing of inputs has left the most price inelastic products for imports. Evidence can again be found in China's trade composition. The proportion of primary products, especially raw materials and mineral fuels, increased from more than 10% in the last twenty years. Primary products are typically more price inelastic than manufactured products.

Chapter 4
Private Sector - Firms

Having dealt with the public and the external sector, I shall turn to the private sector in this chapter. While international reporting standards exist to guide the reporting of the current account; and government budget is a clear concept; the private sector is always the place where complication arises. This is made worse in the case of China as the economy is undergoing rapid transformation. Broadly speaking, the private sector consists of firms and households. Firms invest to make profits and households earn incomes to improve standards of living. As behaviors of these two fractions are governed by very different rules, firms and households are usually treated separately. In this chapter, I will focus on firms first.

	Construction	Purchase of Equipment	Others	Primary Industry	Secondary Industry	Tertiary Industry
1994	63.8%	24.4%	11.9%			
1995	65.8%	21.3%	12.9%			
1996	65.9%	21.5%	12.6%			
1997	62.6%	24.2%	13.2%			
1998	62.9%	23.0%	14.1%			
1999	63.0%	23.6%	13.4%			
2000	62.4%	23.7%	14.0%			
2001	61.7%	23.7%	14.6%			
2002	61.1%	22.7%	16.2%			
2003	60.2%	22.8%	17.0%			
2004	60.7%	23.5%	15.8%			
2005	60.1%	24.1%	15.7%	2.6%	43.7%	53.6%
2006	60.7%	23.2%	16.1%	2.5%	44.1%	53.4%
2007	60.8%	23.0%	16.2%	2.5%	44.5%	53.0%
2008	60.7%	23.5%	15.8%	2.9%	44.5%	52.5%
2009	61.8%	22.6%	15.6%	3.1%	42.9%	54.1%

Table 4: China SYB (numbers are quoted as percent of total fixed investment)

Firms are the main vehicles for investment, and investment is the backbone of China's economic miracle. As we have discussed in the opening chapter, it is more appropriate to term China as an investment driven economy instead of an export driven one. It may be argument that most of the investment might have gone to the exporting department, so exports was still indirectly the ultimate driver of China's growth. This argument may be refuted by looking at the breakdown of total fixed investment. In Table 4, fixed investment is broken down by uses and by industry. Based on convention, agriculture and manufacturing combine to form tradable sector; and construction and services combine to form non-tradable sector. As manufacturing and construction together form the secondary industry, non-tradable sector apparently receive a larger share of fixed investment. Same reason is derived from the uses items as construction makes up almost two-third of fixed investment.
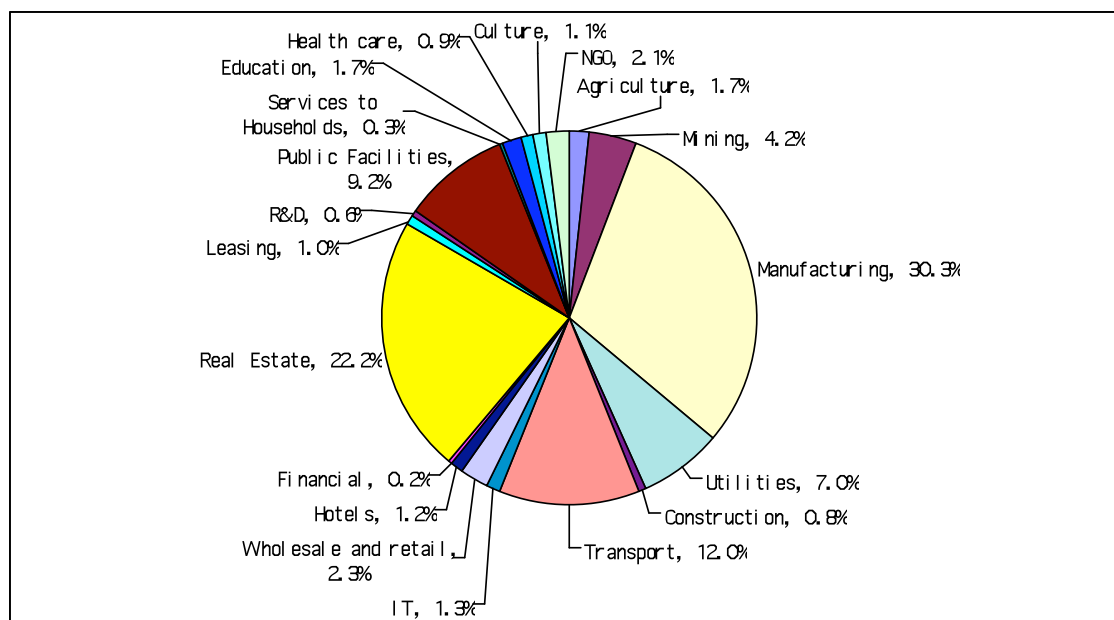

Figure 8: China SYB, Fixed Investment by Sector 2009

There is a potential problem in the definition of the term "construction" because if conventional definition is used, there is no way that the share of construction is more than

the entire secondary industry. Hence, I have also added a more detailed investment by sector graph. Figure 8 provides a snapshot of China's fixed investment in 2009 breaking into sectors. It is clear that the only major sector which can potentially go into the exporting department is manufacturing. Although manufacturing makes 30% of total fixed investment, it is not possible that all investment in manufacturing is used for exports. Hence, export intention may explain at most 10 to 20% of China's fixed investment. As a result, investment directed towards infrastructure accumulation and domestic services are the most important intention for China's huge investment, which in 2009 contributed to almost 50% of GDP as explained in chapter one.

If China's investment is mainly directed towards domestic uses, it is doubtful whether domestic demand can absorb the humongous volume of investment. Such concerns are not unfounded considering the massive size of non-performing loans (NPLs) among all four of China's state owned banks during the 1990s. The problem was only solved after multiple bailouts by the Chinese government. Today, Chinese banks generally look healthy based on standard financial indicators such as capital adequacy ratio, and probably more so than their counterparts in the developed world since the Chinese banks were largely insulated from the global financial crisis. Nonetheless, the highly monopolized banking sector means that the risk of investment will concentrate in the large state banks, making them susceptible to overinvestment.

It is my goal in this chapter to understand China's investments, whether there is overinvestment, and if there is, what is a more sustainable level? Again starting with the macro picture, a first step is to know the composition of China's corporate landscape, which is well indicated by the share of fixed investment undertaken by each type of firms.

Due to China's special background as a command economy, state owned firms, or more commonly known as SOEs, used to account for the entire economy. Hence, SOEs occupied the lion's share of fixed investment in the early years of reform. Although the share of SOEs declined steadily as China's economic reform progressed, there is still significant presence of SOE. As seen from Figure 9, SOE was responsible for more than 30% of all fixed investment, and the weight seems to have stabilized at this level as the decreasing trend had disappeared in the last four to five years. On the other hand, the share of privately owned firms maintained a straight increase with few exceptions. The only notable exception is the three years following 1989, when political turmoil threatened to change the direction of China's economic reform. In 2009, investment by private firms accounted for almost two-third of the total fixed investment.
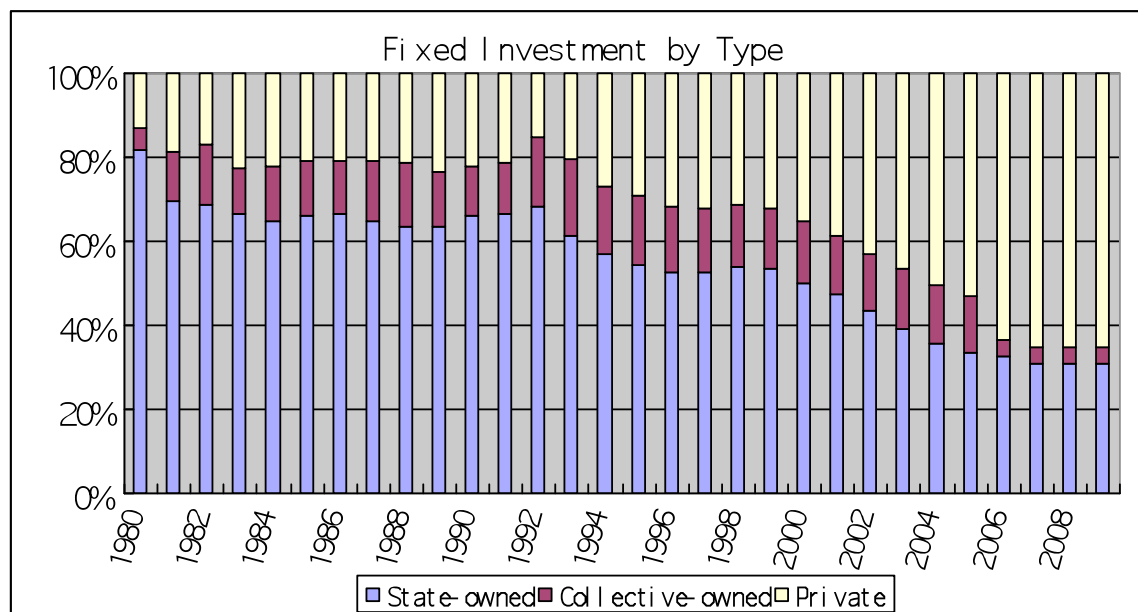

Figure 9: Haver Analytics

The third type of firms is collectively owned firms. This is a special product of China's economic transition, and refers specifically to enterprises owned by towns or villages. Due to political uncertainty in the early years of reform, private properties were

constantly subjected to the danger of a sudden seizure. Hence collective ownership was an expedient means of protecting property rights though management right were usually controlled by few individuals. Furthermore, as most entrepreneurs lacked the initial capital and borrowing capability, collective ownership was an important solution to funding problems. The close interpersonal relationships within a village or small town facilitated the formation of collective ownership. As a result of these advantages, collective ownership was gaining much popularity in the 1980s and 1990s, and this type of firms accounted for a peak of more than 17% of total fixed investment in 1993. However, as private property right was enhanced further and further, collective ownership became an encumbrance rather than an advantage. In fact, many well-known and profitable collective owned firms were demised due to property rights disputes, and many others were privatized through a number of means such as management buyout. Hence, we see the share of fixed investment by collectively owned firms decreasing sharply in the 2000s to less than 4% in 2009. Looking into the future, this kind of informal collective ownership will only become more desolate, and is likely to disappear soon. Hence, I will not devote further attention to the discussion of collectively owned firms.

4.1 SOE Investment

By convention, SOEs should be attributed to the public sector rather than the private sector, but doing so is inappropriate in China because ownership is not always clear. For instance, many SOEs are publicly traded companies, meaning ownership is mixed at least in theory. In most of the cases, the SOEs also do not receive direct

financing from the treasury and are yet to contribute significant profit to government budgets. Instead they tap into both the equity markets and the commercial banking system for financing, and enjoy considerable sovereignty in executing their cash flows. More importantly, years of reform have removed much social burden from the SOEs, and today's SOEs in China are ever more profit driven. Since they act similarly to other private firms, the best option is to treat the SOEs as part of the private sector.

As a distinguishing feather of the Chinese economy, SOEs have received both praises and criticisms. Letting aside of praises, criticisms are mostly concentrated on the issue of efficiency. Many studies have been directed at the link between government ownership and low efficiency. For instance, Sun and Tong (2003) find that share issuing privatization is effective in improving SOEs' earnings ability, real sales, and workers' productivity. Using empirical evidence of public listed companies, Xu and Wang (1997) show that there is a positive and significant correlation between ownership concentration and profitability. More specifically, firms' profitability and labor productivity are positively correlated with the fraction of legal person shares but are either negatively correlated or uncorrelated with the fraction of state shares and tradable A-shares held mostly by individuals.

Although evidence seems overwhelming, these studies have one shortfall in common: they do not provide a mechanism of how government ownership affects corporate behaviors, and how these behaviors are transformed into lower efficiency, thus leaving behind a black box unexplained. Further researches identify employment policy, financing choices and investment behaviors to be the link between ownership and efficiency. Among the identified factors, investment behavior is the most promising one

because in order to maintain desired GDP growth rate, governments tend to push up investments when other components are lagging behind expectation, thus leading to overinvestment. Zhou and others (2005) provide a key evidence for this story by empirically proving that promotion outcomes of provincial governors are closely related to relative GDP growth rates of the region. Using a sample of 1286 observations spanning from 1979 and 2002, the authors build a probit model that regress year end outcomes onto relative GDP growth. The outcomes can be promotion, staying or changing to equivalent posts, and termination. Relative GDP growth takes into consideration of absolute growth rates, previous growth rates under former governors, growth rates in surrounding regions, average growth rates under current governor, and changes in growth rates. Three dummy variables are added to control for age, education and political background. The regression results show that every standard difference move in terms of relative GDP will increase chance of promotion by 15.2% and decrease chance of termination by 12.5%.

Results from Zhou and others (2005) prove that there is strong incentive for governors to push for higher SOE investment, especially at provincial levels and during bad years. However, this result only reaffirm a suspicion that people have long held, but contribute little to understanding the actual level of investment. For instance, in order to conclude that there is overinvestment, one must be able to point out what is the appropriate level of investment. Some attempts have been made. In one of the much cited papers, Wang (2005) constructed theoretical models for both SOE investment and private firm investment. Different ownership structures cause the two kinds of firms to have different objectives and different financing options. For SOEs, the objective is to

maximize both profits and production while private firms only have profit maximizing goal. Both types of firms are subjected to financing constraints, but SOEs face lower financing costs than private firms. Solution to the constrained maximization problem show that SOEs will over-invest while private firms will under-invest.

While much can be said about the underlying equilibrium model itself, the conclusions from such theoretical studies are of little use practically because many variables cannot be quantified, including influence of ownership structure and level of financing constraint. Other theoretical models are more readily applicable for practical purposes, including the familiar Solow growth model. In Blanchard and Giavazzi (2005), the authors carry out a simple exercise of calculating Solow's "golden rule" saving rate (which is equal to investment rate), and get an estimation of about 40%. However, an economy needs to be in a steady state for Solow's optimal saving and hence investment rate to work. As China is apparently far from a steady state, and also due to over-simplification involved, this value is at best a rough guess.

A closest study to practical use is Tang, Ma and Zhou (TMZ 2010). The paper uses differentiate the companies into national SOEs, regional SOEs and private firms. The purpose is that the three types of firms have different investment mechanism. While private firms are assumed to be purely profit driven, regional SOEs are subjected to influences of the regional government, which as discussed before, have much pressure to maintain certain GDP growth rates. To the contrary, national SOEs are directly managed by the central government, and thus are more immune from regional governments. As the central governors are not usually judged upon GDP performance but are more concerned with a variety of measurements such as price stability, the incentive to push for

investment pulled GDP growth is not as strong. Nonetheless, as China's economic and social stability is very much reliant on high GDP growth due to the constant pressure to create employment, the intention to overinvest is still present. Based on such reasoning, regional SOEs tend to overinvest the most, national SOEs next while private firms will either under-invest or not overinvest.

TMZ 2010 uses two different methods to estimate the appropriate level of investment, namely Tobin's "Q" value and Sales Accelerator Model. The first method reflects investment level based on equity market expectation and the second method focuses on estimating growth opportunities based on growth rates of sales volume. The residue of actual investment less "appropriate" investment will indicate over or under-investment. A few control variables are added, including leverage ratio, cash ratio, investment return from previous year, and age and size of the company. Two more dummy variables are added to account for the macro economic condition and the industrial wide environment during the year.

The data set consists of publicly listed companies from 2000-2006. Eliminating financial firms, multinationals (companies that issued H and B shares), companies that went through ownership restructure during the sample period and those with incomplete information, there are 4397 observations for regional SOEs, 490 for national SOEs and 1331 for private firms. The regression results show that firms that engaged in overinvestment include 1645 observations for regional SOEs, 97 for national SOEs and 578 for private firms. The percentages of overinvestment for the three types of firms are 56.1%, 25.3% and 18.3% respectively.

The result for private firms may be rather surprising because most literatures indicate that private firms are financing starved in China, and hence they should be under-investing. The disparity may be explained by the fact that all private firms considered in the study are public companies. Thus, they represent the group of private firms that are most accessible to the financial market, and likely the banking system. However, this group is by no means representative of all private firms in China.

4.2 Private Investment
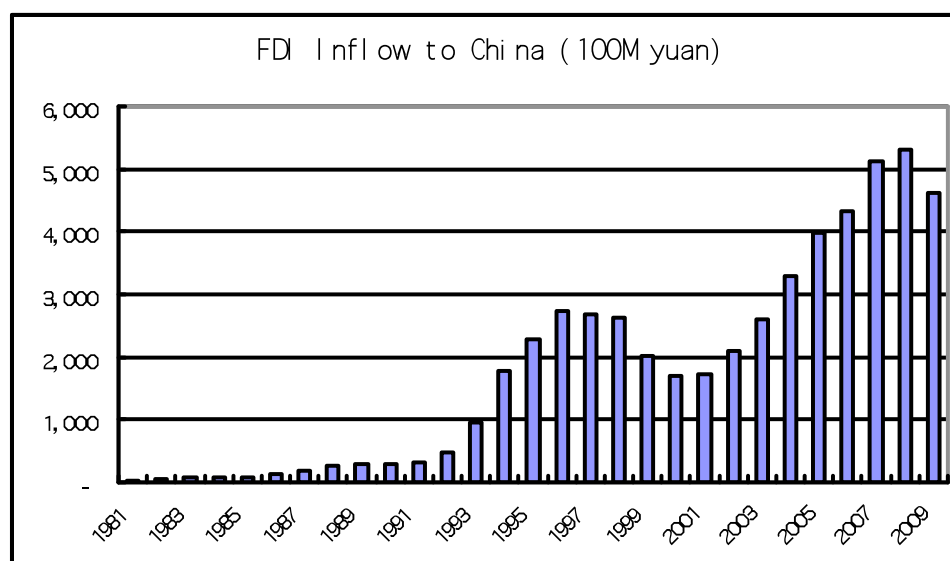
Figure 10: Haver Analytics

Although private investments include both domestic investment and foreign direct investment (FDI), FDI has attracted way more attention than its proportional share. These reports or researches often point to the rocketing amount of FDI inflow into China in terms of absolute value. True enough, FDI shot up from almost nothing in the 1980s and early 1990s to a respectable amount that accounted for about one-third of gross FDI inflows to all emerging markets. This is shown in Figure 10 where the momentum of

increase was strong throughout the later 1990s and 2000s. The only notable slowdown is the years following 1997 Asian financial crisis. As a result, China is often used as an exemplar for attracting FDI and utilizing foreign capital to realize growth. Tseng and Zebregs (2002) is one example of such analysis.
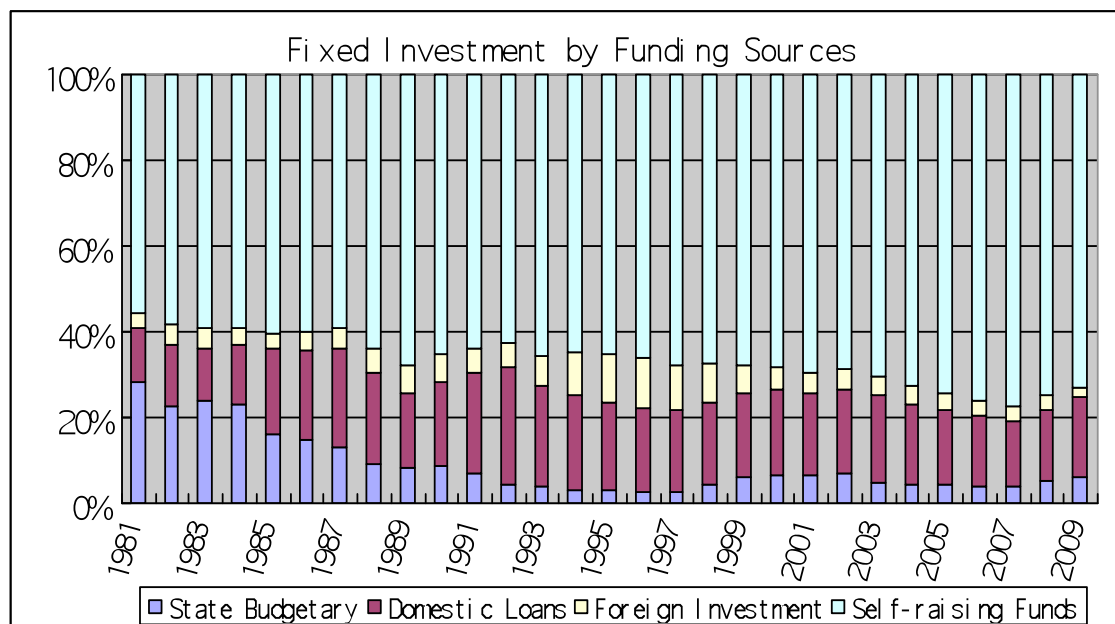
Figure 11: Haver Analytics

The influence of FDI on China's growth is exaggerated in two ways. First, much of China's FDI is in fact the so-called "round-tripping fund" that originated in China, invested in Hong Kong and reinvested back into China to take advantage of the preferential tax treatment of foreign investment relative to domestic investment. Though the exact amount of "round-tripping fund" is unavailable, the fact that around 50% of China's FDI inflow comes from Hong Kong is a telling evidence for the rampant occurrence of "round-tripping" phenomenal. Unless preferential tax treatment is removed, there is no way of knowing the true amount of FDI flow into China. Furthermore, even ignoring the possibility of "round-tripping", the overall impact of FDI in providing

finance is limited. As seen from Figure 11, the weight of FDI to total funding source is never much more than 10%, and decreased to less than 5% in recent years.

The limited impact of FDI on China's growth should not be mistaken for the absence of contribution. Doubtlessly China has benefited from the employment opportunities, management expertise and technology transfer that are usually associated with FDI. However, the bulk of China's private investment comes from domestic private firms, which often invest using self-raised funds. These funds include accumulated labor income, retained profit or borrowing from families and friends. Over the years, the importance of self-raised fund has grown from significant to dominant. For instance, self-raised fund accounted for around 75% of total fixed investment in the most recent five years.

There are a few things we may say about such financing structure. First, the overall financial system is robust. Investing using self-raised fund is also called internal financing. As internal fund is less influenced by external environment such as interest rate changes and the overall health of the macro economy, firms will be in good shape as long as the investment projects they undertake are viable. In other words, healthy firms will not go underwater due to financing problems. Second, system wide risk is limited because the financial system is sheltered from risks firms are undertaking since the amount external borrowing is limited. Third, the importance of state budgetary as a source of financing has declined and stabilized. It is understandable that only SOEs may tap into state budgets through capital transfer. In chapter two Table 2, we mentioned that government transfer spending largely went to the firm sector. The decline and stabilization of state budget financing shows the completion of both SOE and market

reform. On the reverse side, although the financial system is robust, it also means that China's financial system is not facilitating as much financing activities as it should be. Hence, capital is not efficiently allocated, and there is much room for financial development.

Finally, looking at the fof table, we can see that firms are running large deficits in the form of net asset rundown. This is expected because firms borrow from households to fund their investment. The other interesting point to note is that wage spending has decreased while capital spending increased. This means that firms are in general becoming more capital intensive.

	Value added	Property income	Tax and social security	Transfer	Wage	Capital formation	Net asset
1992	57.5%	-4.1%	-14.8%	3.7%	26.5%	28.0%	-12.2%
1993	59.8%	-4.7%	-15.1%	3.8%	25.3%	34.6%	-16.1%
1994	57.6%	-5.3%	-13.6%	3.0%	24.0%	31.9%	-14.2%
1995	60.2%	-5.8%	-14.0%	2.7%	25.1%	31.8%	-13.8%
1996	58.3%	-5.9%	-15.5%	3.0%	24.7%	29.4%	-14.3%
1997	57.2%	-5.4%	-15.7%	2.7%	22.9%	27.5%	-11.6%
1998	54.8%	-5.7%	-15.8%	2.6%	20.5%	26.7%	-11.4%
1999	53.4%	-4.6%	-16.8%	4.2%	19.3%	26.2%	-9.4%
2000	51.7%	-4.4%	-15.2%	4.7%	18.5%	24.8%	-6.5%
2001	51.8%	-3.9%	-16.2%	5.6%	18.5%	26.0%	-7.1%
2002	51.1%	-3.5%	-15.5%	4.7%	20.3%	26.6%	-10.1%
2003	50.0%	-2.8%	-16.3%	4.1%	19.4%	27.4%	-11.7%
2004	58.5%	-1.4%	-14.4%	2.4%	21.6%	29.6%	-6.1%
2005	59.1%	-1.3%	-15.5%	1.2%	23.0%	28.9%	-8.3%
2006	58.0%	-1.7%	-16.4%	0.9%	22.5%	30.9%	-12.6%
2007	56.7%	-1.2%	-16.8%	0.9%	21.7%	29.8%	-11.9%
2008	58.8%	-1.6%	-16.2%	1.0%	21.4%	30.2%	-9.6%

Table 5: China SYB fof tables (numbers quoted as percentage of GDP)

Concluding the chapter, although there is overinvestment, the financial system is in no immediate danger of systematic meltdown. However, more active financial reform will have much potential in improving the overall efficiency of China's economy, and help firms to become more labor intensive as we will discuss in the next chapter.

Chapter 5
Private Sector - Household

Falling household expenditure as a share of GDP in China has raised extensive media attention, and is the kernel of the whole rebalancing efforts in China. Referring to Figure 2 shown in chapter one, China's household consumption has remained at 35% to 36% for the most recent three years when data is available. This is extremely low when compared globally. Based on World Bank data, the number for the US has remained stable at 70% for the past five years, even during the height of financial crisis in 2008 and 2009 when credit crunch caused dramatic fall in consumer spending. The same figure puts UK at 65%, Germany at 58%, and most other developed countries at 50% to 60% range. For peers that are usually compared to China, Brazil residents spent about 60% of GDP and India 57%. Household consumption for Russia dipped to 48% in 2008 from over 50%, but quickly recovered to 54% in 2009. When comparing to other export-led economies, Korea has about 55%, and Singapore is fluctuating around 42%.[5] In fact, with 35% household consumption level, China is comparable to countries like Algeria and Kuwait, which are oil dominated economies with GDP scales nothing close to China. It should be noted that household consumption and private consumption may be used interchangeably in the case of China although the private sector consists of both firms

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[5] http://data.worldbank.org/indicator/NE.CON.PETC.ZS

and households. This is because all firms' expenditures are attributed to investment based on available data. This statistical shortcoming may have caused China's private consumption to appear lower than the actual level. Nonetheless, the international comparison done above and the historical comparison done in chapter one together still provide substantial evidence for the low level of private consumption in China.

We have discussed briefly in chapter one why low consumption level is a problem. This is because when consumption level is low, either net exports or investment has to make up for the shortfall; otherwise the country's GDP will contract. As China's economy is rapidly gaining weight, the world is no longer able to support a large enough net imports from China to keep its economy growing at the similar rates the country has enjoyed for decades. We have also discussed the downsides of supporting the economy with excessive high level of investment. Before suitable strategies can be devised to boost household consumption, we must understand the reasons that have caused its fall in the first place.

Using empirical evidences, Guo and N'Diaye (2010) try to filter out the most important determinants of China's private consumption. By international experience, the main factors influencing the level household consumption include per capital GDP, household income, public consumption, real GDP growth rates, real interest rates, CPI inflation, change in terms of trade, change in REER, the old-age dependency ratio, the share of employment in the services sector, and a measure of financial development. When per capita income in a country is low, most current income will be used for mere subsistence, and there will be high consumption and low saving rate. As per capita GDP rises, more income is available for saving. Hence saving rates tend to increase until it

reaches a certain level of asset stock, which diminish the need for further saving. Hence, consumption will rise again. As such, saving and consumption behavior follow a general path at different stages of per capita GDP development, and thus per capital GDP can be used as an important proxy to predict the level of saving in a country. While per capita GDP tells a micro level story, the total amount of household income as a share of GDP gives a macro level explanation of saving and consumption behaviors. As income represents the constraint to the level of consumption, it is easy to understand why these two are important determinants of private consumption. For the other factors listed above, I will briefly explain each too.

Public consumption may affect household hold consumption in two ways. On one hand, it substitutes private consumption. On the other hand, it frees up available resources for household to spend. Depending on the magnitude of the two directional impacts, the overall relation may either be positive of negative. Higher real GDP growth rates work through higher expected future income and hence larger future wealth to increase household consumption. Real interest rate increases discourage spending and vice versa. CPI inflation has ambiguous effect on household consumption depending on inflation expectation and whether inflation is temporary or permanent. If inflation expectation is high, current consumption will be high. However, if inflation becomes runaway open inflation, reverse Pigou effect will diminish household consumption. Better terms of trade usually will increase consumption. REER appreciation increases the household purchasing power and thus their spending decisions. Higher dependency ratio usually increases household consumption as older people generally draw down their lifetime savings. The share of employment in the service sector increases household consumption

from both demand and supply side factors. On the demand side, as the service sector is usually more labor intensive than manufacturing and agriculture, higher employment share in services shift national income distribution towards labor, which is usually the main source of income for household. On the supply side, as services are mostly non-tradable, increase in service employment share itself means that a larger variety of services is available for domestic consumption. Finally, Greater financial development tends to increase household consumption as greater access to finance reduces the needs for precautionary spending.

Returning to the Guo and N'Diaye (2010) paper, the study regress private consumption data on the factors mentioned above using Generalized Methods of Moments (GMM) estimator with an unbalanced panel of 39 economies. Natural log expression is used for the equation to capture non-linear relationship between the regressors and private consumption. The prediction result from the exercise fits actual outcome reasonably well for the period from 1995 to 2007 although large discrepancy exist for the prior data points. This is not a problem to be over concerned as the discrepancy could be due to lower quality data in the earlier years. In order to check the regression, Guo and N'Diaye add a China specific dummy and re-run the regression. The result from the second exercise does not show improved result from the original one. Hence, the study demonstrates that conventional factors discussed earlier explain China's declining household consumption reasonably well. Therefore, rather than searching for alternative factors related to the Chinese culture, I will follow conventional approach by looking at rising saving rates and falling income share for explanation of observed decline in China's household expenditure.

5.1 Saving Rate

It has long been noted that China has extraordinarily high saving rates that dwarf even all its thrifty Asian neighbors like Japan and Korea. The much quoted figure is the gross saving rate, which has exceeded 50% in recent years as shown in Figure 8. However, as all corporate earnings are assumed to be reinvested in China, the national gross saving rate is arbitrarily overestimated. Hence the household saving rate taken directly from China Statistical Yearbook 2010 fof data is more appropriate for our discussion. The figure shows a continuous hike in saving rate since 2001 and it has almost reached 40% in 2008. Though the exact number may differ slightly from source to source, the overall trend and approximate level should be similar no matter where the data come from.
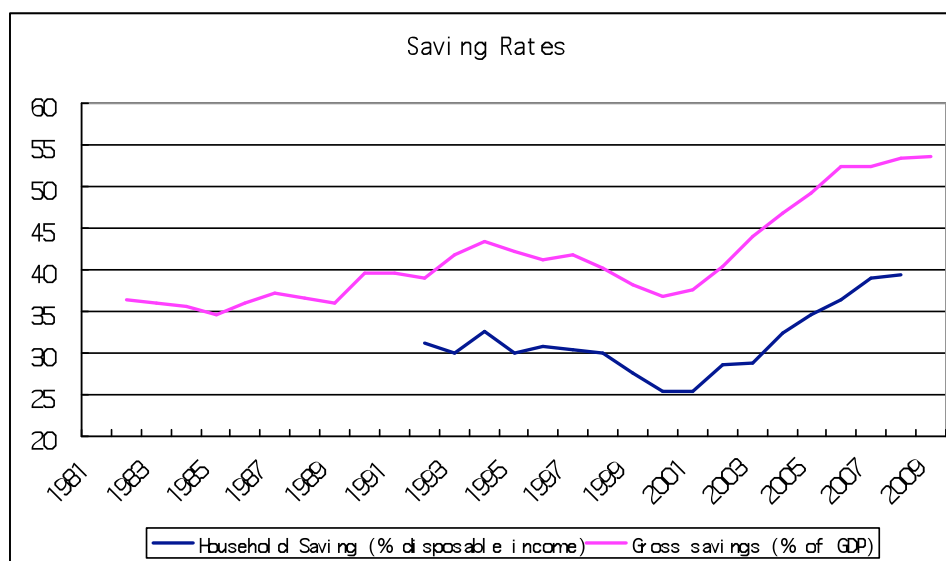

Figure 12: World Bank Country Database, China SYB fof tables

The initial mild increase in the late 1980s and early 1990s is easy to understand as Chinese households were moving away from subsistence income. However, the

continued increase in saving rate in the 2000s is much more boggling both due to the extent of the hike and the time period which corresponded to a time of rapid income growth. The outcome is in direct conflict with life-cycle hypothesis (LCH) saving literatures, which predict falling saving rate when people expect future income increase and hence postpone savings. In Cao and Modigliani (2004), the authors try to defend LCH by concluding demographic change as the major cause of saving rate increase in China. This is because the one-child policy has undermined the traditional role of the family in providing old-age support. Hence, implicit saving in the form of more children is transformed into the explicit form of higher saving rate. However, the result from Cao and Modigliani (2004) is unsatisfactory because the age-saving curve in China is not flat but u-shaped, meaning that saving rate increase is most pronounced among younger and older household heads. Thus, while saving increase by old people could have come from insurance purpose, it is implausible that younger people are saving more to securing retirement support. Hence, an acceptable explanation must account for both ends of the age axis.

Chamon, Liu and Prasad (CLP 2010) provide such an explanation by attributing the cause to income uncertainty and pension reform. Using China Health and Nutrition Survey (CHNS) [6], and following Blundell, Pistaferri and Preston (2008), which studies the link between consumption and income inequality through the degree of consumption insurance with respect to both temporary and permanent income shocks, CLP (2010) try to differentiate the CHNS data into temporary and permanent income shocks. They find that variance of permanent shock had remained stable while variance of temporary shock had increased fourfold during the survey period. At the same time, CLP (2010) also

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[6] http://www.cpc.unc.edu/projects/china

analyze the 1997 pension reform in China, and conclude that the reform decreased replacement ratio from 75-80% relative to the average wage to around 60%.

Using the empirical results, CLP (2010) calibrate a modified version of permanent income model: the buffer-stock life cycle model. The method comes from Carroll (1997), which postulates that buffer-stock savers have a target wealth-to-permanent-income ratio. If wealth is below the target, the precautionary saving motive will dominate and the consumer will save. If wealth is above the target, impatience will dominate and the consumer will dis-save. In this model, increased uncertainty will require a larger buffer-stock to handle and hence increase savings. Simulation results show that increased uncertainty and pension reform can together explain half of the increase in saving rates, or about 8%. The U-shaped age-saving curved is because higher uncertainty affects younger household heads more than other age groups as buffer stocks are typically accumulated at the beginning of life cycles. On the other hand, as older household heads have less time to adjust to reduced pension before retirement, the pension reform has a larger impact on them than the rest. As all parameter choices are relatively conservative, simulation results could have been stronger.

Following this logic, further pension reform to recover or surpass the original level of replacement ratio and at the same time providing more income certainty could reduce 8% or more of China's household saving rate. However, as China's market reform deepens, it is unlikely that people will enjoy the same kind of income certainty as they did under SOEs, which used to employ for life and promote according to number of years served.

5.2 Household Income Share

If household income share have stayed the same, the increase in saving rate alone would have only caused household expenditure to decrease to 40% instead 34% of GDP in 2009 based on fof data. Hence, we have to look into household income distribution of the other part of explanation for the dramatic fall in household expenditure. Although it is widely felt that household income share in China has decreased in the most recent decade, the exact extent of decrease is not immediately clear as different sources give different results. He and Wang (2010) combine statistical data from various sources, and conclude that the initial income distribution for household has decreased from the peak value of 67.2% in 1996 to 60% in 2007, when the data series ended. Correspondingly, initial distributions for government and business have increased from 15.5% and 17.3% to 17.1% and 22.9% respectively during the same time period. More importantly, after taking into account of tax and social welfare redistribution, the redistributed income share for household has decreased from 1996 peak of 68.3% to 57.7% in 2007. Hence, the redistribution process increased household income share by 1.1% in 1996 but decreased it by 2.3% in 2007. This change reveals the underlying policy shift disfavoring the household sector.

International and historical experiences show that national income distribution is typically very stable both in the long run and short run. Hence, it is surprising that household income share could decrease as much as more than 10% in a short ten years. Bai and Qian (2009) point out that caution needs to be exercised when reading the income distribution statistics and coming to the quick conclusion that intentional policy changes are needed to reverse the drop. This is because part of the decrease is due to

computational factors, and the rest is largely a predictable result of China's economic growth. The authors note that there were two major changes in recording methods in 2004. First, income of self-employed entrepreneurs was counted as wage income before 2004, but was attributed to profits thereafter. Second, all agricultural income was shifted to wage income while the value was split between profits and wages prior to 2004. This is due to practical difficulty of separating the two in the agricultural industry. Wage income is the major channel of household income. Hence, any changes increasing wage income share is likely to increase household income share while the reverse tend to decrease it. As these two changes have opposing effects, the overall result is not strait forward. Based on the authors' calculation, the combined effect contributed to 6.3% decrease in aggregate wage income.

Besides methical confusion, China's economic reform has shifted GDP composition from agriculture to manufacturing, and state sector to private sector. It is well documented that the manufacturing industry is more capital intensive than the agricultural industry, thus wage share in manufacturing industry is naturally lower. It is also noted that wage spending by state-owned firms is substantially higher than that of private firms, partly due to larger redundancy state-owned firms tend to employ. As the structural changes from agriculture to manufacturing and state sector to private sector are the exact intensions of China's economic reform, we should not be surprised that household income share has decreased as a result. The authors again estimate that industrial and sectoral changes have contributed to 3.36% and 2.12% decrease respectively to wage share. Hence, if results from Bai and Qian (2009) are correct, 11.8% wage decrease is caused by inevitable reasons. As wage income typically account for

more than 80% of household income, these inevitable reasons have caused 9.4% decrease in household income share decrease. Therefore, we are only searching for the remaining 2% of the cause for reasons that could have been avoided or can be reversed in the future.

Despite of the fact that decrease in private consumption may not be as dramatic as it appears to be, and some of the causes may have been inevitable, it does not imply that no action is needed. In fact, the sources for household income share decrease are present across all major sub-categories, namely investment income, transferred income and labor income. Based on China Statistical Yearbook fof data, the three major types of income account for 6.1%, 10.9% and 82.5% of total household disposable income in 2008 respectively, with investment income making up the smallest share and labor income the largest.

Within investment income, 84.4% is attributable to interest earning. Unfortunate, legal constraints have instituted deposit rates ceiling and lending rates floor so that banks can benefit from a comfortable interest margin. Porter and others (2009) show that deposit rates would likely increase if financial liberalization is allowed to take place in China. The paper models China's banking sector as an oligopoly market where each bank chooses lending and deposit taking activity and engage in Cournot competition. If banks are allowed to compete for deposits by bidding up rates, small banks will offer higher deposit rates to increase their size and larger banks shrink their deposit bases to reduce costs as small and large banks are assumed to be on the downward sloping and upward sloping portion of the long run average cost curve respectively. Using different parameters and different methods of liberalization, the authors obtained the results of 36 to 61 basis points rate increase. Given current deposit rates ceiling is fluctuating around

3% depending on monetary policies, the increase represents 10% to 20% in household interest earning. Using income composition ratio quoted earlier, the change will lead to about 0.5% to 1% increase in household income share.

Although the direct impact of interest rate liberalization on household income seems small, there are a number of indirect ways where interest rate liberalization may significantly impact household income and behaviors. For instance, buying a house is usually treated as an alternative to depositing money in the bank. If increased deposit rates direct funds away from the real estate market, there is going to be a large impact on household saving and consumption behaviors. However, indirect impacts as such are too complicated to model as there are many uncertainties involved. Hence, I will not take them into consideration in the projection in the next chapter.

Other than interest earning, all other investment channels have minimal earning capabilities. For example, dividends earning is very small due to three-tier reasons in terms of capital markets underdevelopment. On the first layer, the IPO market is immature. Hence, the per capita number of public companies is small. Secondly, as the stock markets are badly monitored and the fund markets are underdeveloped, the proportion of both direct and indirect share ownership is small. Lastly and most importantly, dividend distribution is extremely rare in China for both SOEs and public private companies. This is due to a combination of regulation deficiency and financial constraints, leading companies to retain all profits since for reinvestment since alternative financing options are very costly. As a result, increasing profits in the business sector is not passed on to the household. Similarly, since SOEs hand little profits to their

government owners, profits from SOEs do not benefit the population through the state welfare system.

Turning to transferred income, we have mentioned earlier that the redistribution process changed from favoring the household sector in 1996 to disfavoring it in 2007. This is largely due to the SOEs pension reform carried out in 1997. The reform freed the SOEs from pension obligations before a new pension system was established. It created void in social safety net, which was only being gradually filled in the following years and is still being completed in present days. Using the latest fof data, the household sector received 6.2% of GDP for social welfare transfer in 2008 while contributing 5.7% GDP in terms of income tax and social security payment. Thus, there was only a 0.5% GDP net transfer from the social welfare system. Comparing to that of 1996, 5.0% was received as government transfer and 2.7% was paid back into the social welfare system, representing a 2.3% net transfer. Thus, there is a total decrease of nearly 2% GDP in transfer income.

5.3 Wage Income

Finally, I shall turn the focus to wage income. It is unsurprising that wage income should make up the largest component of household income, but is surprising how fragmented and distorted wage and employment data is in China. Most statistics concerning wage and employment are collected and published under the central guidance of the National Bureau of Statistics (NBS). However, other ministries have certain statistical turf that is their particular responsibility for historical or bureaucratic reasons, and there seems to be little coordination among the relevant ministries. For instance, with regard to manufacturing employment statistics, the Ministry of Labor gathers data on

most components of the city economies, leaving a small but rapidly growing segment to the State Administration for Industry and Commerce, namely the "self-employed entrepreneurs" who most often do not employ just themselves. On the other hand, the collection of data and the reporting of statistics in rural areas and in towns are left to a part of the Ministry of Agriculture. Given this practical difficulty in getting a single true picture, I have to present both the official statistics and various studies to gain a better understanding of China's wage and employment situation.

	Employment growth	Wage growth	Labor participation	Unemployment rate
1992	1.0%		57.0%	2.3%
1993	1.0%		56.9%	2.6%
1994	1.0%		56.9%	2.8%
1995	1.1%		56.8%	2.9%
1996	1.3%	1.5%	57.0%	3.0%
1997	1.5%	−1.7%	57.3%	3.1%
1998	1.8%	7.7%	57.8%	3.1%
1999	1.0%	3.5%	57.8%	3.1%
2000	1.6%	3.3%	58.4%	3.1%
2001	0.6%	7.4%	58.3%	3.6%
2002	1.2%	4.3%	58.7%	4.0%
2003	0.9%	2.0%	58.9%	4.3%
2004	1.0%	3.2%	59.1%	4.2%
2005	1.4%	2.0%	59.6%	4.2%
2006	0.5%	1.6%	59.5%	4.1%
2007	0.5%	3.6%	59.5%	4.0%
2008	0.8%	6.7%	59.7%	4.2%
2009	0.7%	2.1%	59.8%	4.3%

Table 6: China SYB

Based on China Statistical Yearbook fof data, labor income has fallen from a stable level of around 60% in the 1990s to 47.8% in 2008 as GDP share. This is due to slow employment increase, which is around 1% and slower-than-GDP-growth wage increase as shown in first and second column of Table 6. However, this situation does not seem to fit the official employment data. In the third and forth column of Table 6, labor

participation rate, which is the ratio between economically active population and total population, increased slowly from 57% to 60% from 1992 to 1998; and unemployment rate started very low at about 2% and increased slightly to about 4%. This implies a very tight labor market where most people have already participated in the labor force and the labor force is almost fully utilized. In an economy where the labor market is tight and growth rate is high, it is implausible that wage rate or employment, or both of them should not have grown more quickly.

The most obvious loophole seems to be the unbelievably low unemployment rate. It is commonly known that China's economic reform started with a situation where there was massive amount of slack in the economy, meaning hidden unemployment or underemployment was enormous. As laid off was legalized, we would expect unemployment to shoot up, and this is generally what the media tells us that China constantly face immense employment pressure. Although we may think there was deliberate human manipulation of data, Lee and Jia (2010) explain that it is due to the reporting guidelines that distortion occurred. The paper documents the major disparity between Chinese and international unemployment reporting standards. In short, the official figures only reflect unemployed urban residences who registered at local employment service agencies. The term "urban" refer to cities that exclude employees working outside narrowly defined city boundaries. Even population located in suburbs, large industrial parks, and towns that have been officially established as urban places since the 1980s are excluded from the so-called urban statistics on employment and earnings. Hence, there is little surprise that the official figures do not reflect the overall labor market condition.

Due to unsatisfactory official figures, scholars and research agencies have looked for alternative sources and come up with their own estimations. One of the major alternative sources is the census data, which report 1% of total population and is generally accepted as significantly more reliable, accurate, and thorough than other annually reported statistics. Unfortunately, nation-wide census is only carried out once every five years, and thus a continuous time series is not available. The most recent census results are from 2000 and 2005. Although unemployment rate is not one of the survey items, we may derive the implied unemployment by taking the ratio between total employment and total economically active population. They are 10.4% and 7.4% for 2000 and 2005 respectively.[7] Hence, 77 million and 58 million were unemployed in 2000 and 2005. The census results are similar to the sampling result carried out by the Central Government Development and Research Center, which report that real unemployment was between 13 to 15% in the 1990s, and remained above 10% in the early 2000s.[8]

There are other studies that have come to conclude even higher unemployment rate than 10 to 15%. In a comprehensive report, Banister (2005) estimates that there are 100 to 150 million surplus labor that are either unemployed or underemployed in 2002, which makes that year's unemployment rate 13.3% to 19.9%. Banister's result is widely quoted in other reports. Besides, well known Chinese economist Feng Lanrui reaches a total unemployment as high as 27.8% in 1998.[9] Moreover, according to Yin Chengji, the spokesman for the Ministry of Human Resources and Social Security, "Twenty-four million people, including 6.3 million fresh college graduates and 6 million high school graduates, will enter the job market this year (2010) but only 12 million jobs were

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[7] Based on calculation from Qin (2010), *Inquiry into Economic Issues*, issue 9
[8] Ding, Ge, Dong, Yang and Sun (2001), *Management World*, issue 1, pp 6
[9] Guo (2002), *Teaching and Research*, issue 2

available." However, NBS statistics only record an average annual entrance of 7 million workers into the labor force in the 2000s. If we assume an annual entrance rate of around 20 million workers and keep the NBS total employment data, the implied office unemployment rate will be 16% instead of 4%.

There are apparently many other estimation results. However, before improvements are made on raw data collection, there is simply no singe figure, or even a single range that can be proven to be the true unemployment rate. Nonetheless, we may still draw some tentative conclusion from the various researches surveyed above. Firstly, official unemployment figures of below 5% have underestimated the reality. Whether the true picture is below 10%, lower tens, upper tens or above twenty percents, I am unable to identify. Secondly, there is almost certainly surplus labor in China, and the number of surplus labor seems to have decreased in the 2000s, especially in the recent years. Thirdly, the difficulty of estimating unemployment is mainly due to the difficulty of identifying total economically active population. Thus official employment data is more reliable than official unemployment data. With these conclusions, we may go on to discuss other literature regarding the relation between various policy options and the labor markets.

It is generally felt that wage rate is very low in China as compared internationally, and wage rate increase has far lagged behind productivity increase. Based on the same report of Banister (2005) quoted earlier, manufacturing wage rate in China in 2002 was 3% that of the US, 10% of Asian NIE (Hong Kong, Singapore, South Korea, Taiwan), and 25% of Mexico. The most popular explanation is that large reserve of surplus labor in the rural area has prevented wage rate from increasing. However, as reliable productivity indices and wage rates are both missing, it is impossible to say much more about future

wage rate path. The general expectation is that China's wage rate will enter a path of quicker increase because the pool of surplus labor has diminished. Waves of labor disputes concerning wage rates were also observed in 2010, and in most cases resulted in wage increases. This is a relatively new phenomenal. One of the reasons for successful wage increase demand is that the Chinese government had stayed neutral in those disputes while it used to side the employers before in an attempt to keep China's wage rate low and stay competitive in the export market. This further corroborates the conjecture that pressure to create more employment has eased in recent years.
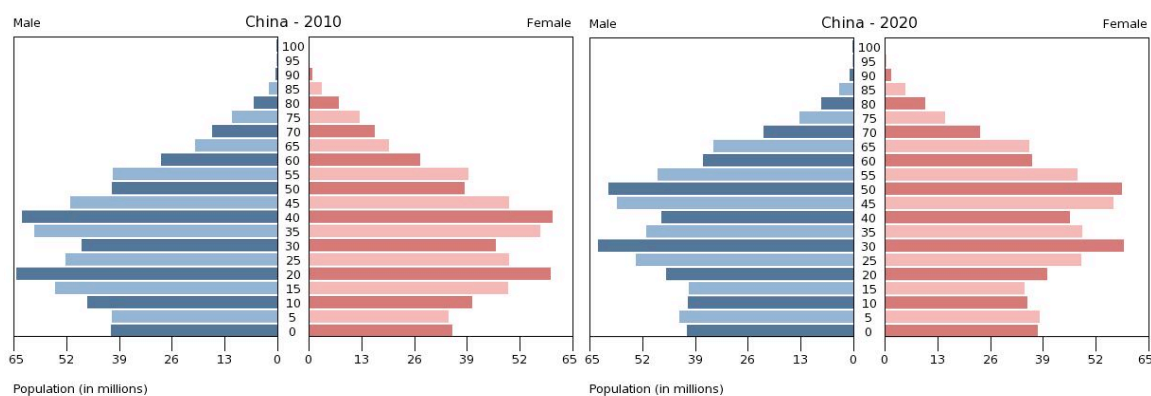
Figure 13: US Census Bureau International Data Base

More support for the story of quicker future wage increase may be found from China's demographic data. As effects of China's world-renowned one-child policy start to manifest on working population, the rate of new entrance to labor force will experience a sharp decline. This may be seen from the population pyramid, which shows a large drop in the 15 to 20 years old population cohort in 2015. By 2020, the first wave of baby boomers will start to enter retirement age as shown by the group aged 50 to 55. [10] As labor supply shrink, the pool of surplus labor may disappear sooner than we think. All in all, the pressure will be on wage increases.

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[10] Current legal retirement age for female is 55 years old in China

If surplus labor have kept wage rate low, it is hard to see why employment growth could not have been faster to prevent the decline in the wage share. There are various reasons being put forward. The first line follows financing constraint. Fazzari and Petersen (1993) argue that financially constrained firms would prefer to use working capital as a source of financing to keep a stable level of fixed investment. This is mainly due to high marginal cost of acquiring fixed capital, and at the same time an increase in firms' capital stock could serve as collaterals and thus alleviate some of the borrowing constrains. On the other hand, working capital investment is easily reversible and less costly to adjust. Using US data from 1970 to 1979, the authors provide empirical support for fixed investment smoothing with working capital.

Applying the argument of financially constrained firms to the case of China, Aziz and Cui (2007) explores the role of China's underdeveloped financial sector in the story of household income decline. Although liquidity is abundant in China, especially in the last couple of years, only the large and cash-rich firms have easy access to bank credit, which is the dominant form of financing in China, and most of such firms are SOEs. The authors find that the persistent and rising difficulty for average firms to obtain financing has played a major role in explaining the co-movements in employment, household income and consumption. As economic wide data is absent, the study makes use of firm-level evidence, which is based on the World Bank Enterprise Survey on Productivity and Investment Climate (2002). The survey covers 1500 Chinese enterprises from five cities.[11] Average employment growth was 5.36%. The regression results show that without financial obstacle, employment growth could have been 2.45% faster for all firms and 3.08% faster for private firms.

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[11] Beijing, Tianjin, Shanghai, Chengdu and Guangzhou

Besides financial constraint, the other line of reasoning focuses on structural problems. It is known that China has favored the trade sector by implementing differential tax treatment, and arguably depressed exchange rates. Guo and N'Diaye (2009) try to simulate the employment effect of China's focus on trade. The paper defines non-tradable sector to be the sum of the tertiary and construction industries and tradable sector to be agriculture and manufacturing industries. Using the GMM with a sample of 28 economies[12] for a total of 575 observations, the paper construct a cross country model that link per capital income and share of employment in the services, agriculture, and manufacturing while controlling for relative productivity of tradable and non-tradable sectors, the real effective exchange rate (REER) and government spending.

Their regression results show that for manufacturing, China has a share of employment consistent with its level of per capita income. However, the service sector could potentially absorb 70 millions more workers, or 9% of total employment at its current per capital income level. This has the implication of increasing wage income of the 9% workers by 60%, or 5.4% increase in total wage bill. In order to do that, every percent increase in service employment share needs 10% REER appreciation, 7% increase in government consumption or 4% increase in relative productivity of non-tradable sector.

To summarize this chapter, I have organized the flow of fund information for the household sector as shown in Table 7. It can be seen that the household is running a large surplus through asset accumulation, and at the same time shifting expenditure towards investment. This means that households are building up potential to consume more in the future if appropriate policies can be devised to modify household behaviors.

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[12] the 21 OECD members plus China, Hong Kong, Indonesia, Malaysia, Singapore, Thailand and Taiwan,

	Wage	Property	Tax and social security	Expenditure	Capital formatio	Net asset
1992	60.3%	4.4%	2.4%	46.3%	5.4%	15.5%
1993	56.3%	5.1%	2.1%	44.5%	5.0%	14.0%
1994	56.5%	5.7%	2.0%	43.3%	5.0%	15.9%
1995	57.3%	4.9%	2.1%	45.0%	5.1%	14.2%
1996	58.9%	5.2%	2.1%	45.8%	6.0%	14.4%
1997	57.3%	4.3%	2.6%	44.7%	5.7%	13.8%
1998	56.5%	4.3%	2.6%	44.5%	5.3%	13.6%
1999	55.8%	3.4%	2.3%	44.5%	5.2%	11.8%
2000	54.8%	3.2%	0.8%	43.8%	5.0%	9.9%
2001	53.3%	3.0%	0.6%	42.5%	5.1%	9.3%
2002	54.1%	2.8%	0.5%	41.0%	5.2%	11.3%
2003	52.2%	2.4%	0.2%	39.0%	5.7%	10.1%
2004	56.1%	1.6%	0.8%	40.0%	8.5%	10.0%
2005	57.2%	1.9%	0.5%	38.3%	9.3%	11.9%
2006	55.5%	2.3%	0.3%	37.0%	7.5%	13.6%
2007	53.8%	2.3%	0.2%	35.0%	7.2%	14.2%
2008	54.9%	2.3%	0.5%	35.0%	8.7%	14.0%

Table 7: China SYB fof tables (numbers are quoted as percent of GDP)

Chapter 6
Projections and Analysis

Having discussed all three sectors of the Chinese economy, I will go on to some projections about China's rebalancing efforts in this chapter. Instead of starting bottom up, I will use a backward induction method. In other words, desired GDP growth rates are firstly decided on. Then the entire GDP is divided into the four conventional fractions, namely private consumption, public consumption, investment and net export. Following the macroeconomic identity and using results from studies we have discussed, I will try to figure out what actions have to be taken in order to realize the desired growth.

6.1 Scenarios

To do this, I refer to various sources of forecasts, including the IMF World Economic Outlook forecasts, growth goals announced by the Chinese authority for the twelfth Five Year Plan as well as other individual researches. Based on these forecasts, it seems that people generally expect China to grow at a rate of 5% to 8% in the next five to ten years, and the general consensus is that growth will gradually slow down. Hence, I construct three growth paths: sustained growth, adjusted growth and slowed growth. Under the sustained growth path, China's economy will grow at 8% in 2011 and gradually cool down in the next ten years to 5% in 2011, and thereafter maintain 5%

growth rate until 2025. Under the slowed growth path, China's economy will start with 6% real GDP growth rate in 2011 and cool down to 3% in 2021, after which 3% growth rate will be maintained. The adjusted path is something in between where China will start at 8% growth rate in 2011 and slow down all the way to 3% in 2025. The three paths picked are supposed to be representative of some scenarios rather than predicting the actual growth paths. They are arbitrarily chosen to determine the path of the three balances and orders of magnitude.

Sustained growth	Adjusted growth	Slowed growth
1) 20% appreciation REER	1) 10% appreciation REER	1) 10% appreciation REER
2) tax equalizing for trade and non-trade departments	2) tax equalizing for trade and non-trade departments	2) tax equalizing for trade and non-trade departments
3) financial liberalization	3) financial liberalization	3) no financial liberalization
4) 54% rise in government spending and transfer	4) 41% rise in government spending and transfer	4) 37% rise in government spending and transfer
5) Implement over 10 years	5) Implement over 15 years	5) Implement over 10 years

Table 8: author's calculation

For each growth path, I have prescribed a policy package, which includes exchange rate policies, fiscal policies, industrial policies and financial liberalization. This is shown in Table 8. The rationale for the sustained growth policy package is as follow. Based on literatures surveyed earlier, a combination of 20% REER appreciation, tax equalizing trade and non-trade departments,[13] and 35% rise in public spending will

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[13] Works through increasing the relative productivity of non-tradable sector to tradable sector by encouraging capital flow into non-tradable sector

increase share of service employment by 9%, leading to 5.4% in wage income.[14] Besides, an additional 7% transfer in terms of pension payment will help to restore replacement ratio to pre-1997 level. If income uncertainty can somehow be reduced, this will help to reduce China's household saving rate to 31.4%.[15] Financial liberalization contribute to household income in two ways, first by increasing interest earning, and second by encouraging employment growth.[16] Together it increases household income by 5%. Further more, we have discussed that wage rate is likely to increase faster in coming years. As no regression result is available, I simply assume that wage rate will contribute 1% boost to household income each year. Similar reasoning is used the other two policy packages, which affect household income and saving to a different extent due to variation of the prescription.

Regarding the external sector, exchange rate changes affect both imports and exports. I take import price elasticity of 0.41 from the last rolling sample of Aziz and Cui (2007), and export price elasticity of 1.55 from the whole sample. This is because the trend for import price elasticity is unidirectional and seems to have stabilized in the later period while the trend for export price elasticity fluctuates both up and down. For similar reason, import demand elasticity of 1.17 and export demand elasticity of 4.26, both from the last rolling sample are used. Assuming that the world economy grows at a constant rate of 2.5% a year, 20% REER appreciation will lead to a 3.3% GDP trade deficit for China while 10% REER appreciation will lead to a balanced trade.

For investment spending, we have discussed that overinvestment occur in China. Total investment involves investment by governments, households and firms.

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[14] Guo and N'Diaye (2009)
[15] CLP (2010)
[16] Aziz and Cui (2007); Porter and others (2009)

Government investment is part of the fiscal policy, so the problem of overinvestment is not relevant. If we assume household invest rationally to maximize household utility, there is little reason that overinvestment should occur. Hence, only firm's investment is subjected to overinvestment. According to TMZ (2010), regional SOEs, national SOEs and public private firms are overinvesting 56.1%, 25.3% and 18.3% respectively. There are two difficulties in applying this result. First, we have discussed earlier why the public private firms are not representative of all private firms. Second, data for separating regional and national SOEs' investment is absent. As an expedient means, I will assume that all SOEs are overinvesting 50% and no overinvestment occurs for private firms. Based on fof data, firms' investment accounted for 71.3% of China's total investment during 2000 to 2006.[17] Referring to Figure 9 for share of private and SOE investment, and referring to Figure 2 for investment's weight in GDP, 5.8% of the 40.6% GDP was overinvested. Hence, the appropriate level of investment is 34.8%, and I will round it off to 35% for convenience sake.

Finally, besides those already explained, additional public expenditure is used to boost GDP growth to the desired path. Take the example of sustained growth path, 35% increase in public spending is needed to modify household income. Given household expenditure after policy influence, a 3.3% GDP trade deficit caused by exchange rate policy, and 35% GDP investment spending, there is still a gap between desired growth and projected growth. Hence, I assume that additional public spending will make up the residue so that desired growth equals projected growth. The policy package is implemented over a period of ten years for the sustained and slowed growth paths, and over fifteen years for the adjusted growth path.

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[17] In accordance with time span of the sample used in TMZ(2010)

Projection for GDP breakdown is showed in Appendix 3. Based on the results, private consumption as GDP share will increase from 35.1% currently to 47.9%, 46.4% and 45.4% under sustained, adjusted and slowed growth respectively. As mentioned earlier, net export will be balanced for adjusted and slowed growth, but register a 3.3% deficit for sustained growth. As investment is set to 35% of GDP, public expenditure makes up 20.4%, 18.6% and 19.6% of GDP for the three growth path respectively.
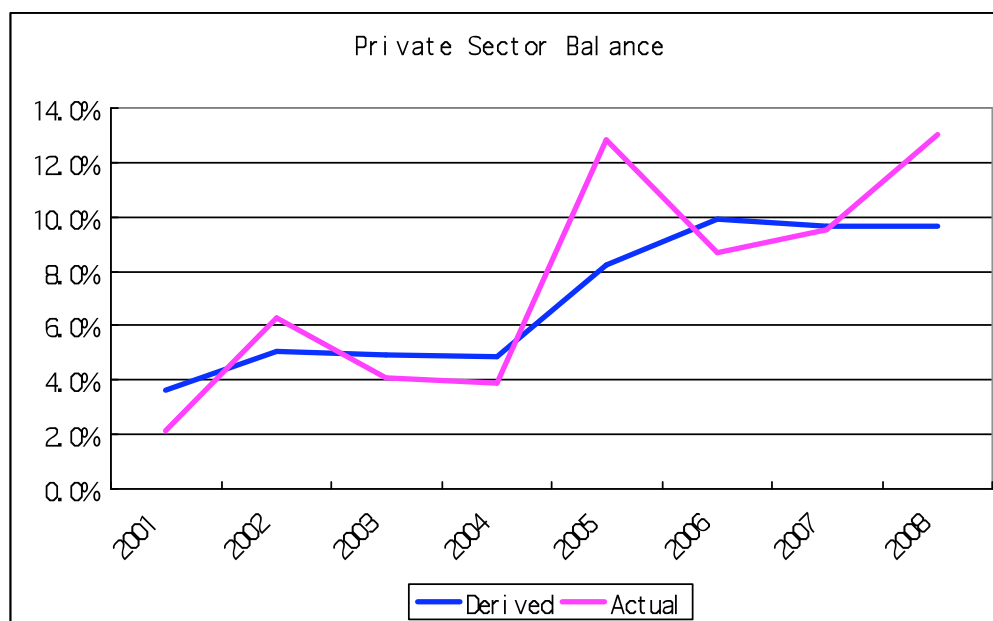

Figure 14: Author's calculation

Besides GDP breakdown, we are also concerned with the three sector balances. In chapter one, the private sector is shown as a derived value from the other two balances. Through the discussion, we know that the private sector is made up of both firms and households. In order to obtain an actual value for private sector balance, I take household disposable income less expenditure to obtain household balance, and firm income less wage payment and capital formation to obtain firm balance. In other words, both capital formation and net asset change columns shown in Table 7 are counted towards private sector balance while only net asset change column shown in Table 5 is included. The

reason for including household capital formation in the private balance is because investment as such is often a way to store surplus income. The best example is home purchase. Based on China's reporting standard, spending on rents is counted towards expenditure while spending on buying a house is counted towards capital formation. Due to financial repression, fund that could have been invested in liquid asset is usually directed towards the real estate market in China. In this sense, capital formation by household is optional, and often can be liquidated readily during time of need. Hence it resembles a asset change. On the other hand, firms need to invest in both fixed and working capitals in order to keep the operation running. For firms, investment is part of the business instead of a surplus fund that is temporarily stored in the form of fixed capital. Hence, it is not included in the sector balance. From Figure 14, we can see that the actual data is far from a perfect match of the theoretical data. Years like 2005 and 2008 are especially problematic with gap of more than 3 or 4% of GDP. Nonetheless, it is a reasonable fit that at least proves the legitimacy of the method I have calculated the private sector balance.

Both household income and expenditure are implied from the policy prescriptions. Firm spending on capital formation also comes directly from the sustainable level of investment we have calculated. Assuming firm income will grow in line with GDP, we can obtain the private sector balance. Regarding current account balance, I make a simplification of equating it to trade balance. Although this is not exact, net exports always account for the bulk of current account activities with orders of magnitude much higher than that of net income from abroad and foreign transfer. Hence, this simplification will not distort the projections results since we are not doing exact

prediction. Applying the macroeconomic identity, we can obtain a public sector balance. As public expenditure information also comes directly from the policy packages, we can derive the public sector income. The projections show that public sector deficit will reach 5.7%, 4.4% and 3.5% of GDP for sustained, adjusted and slowed growth. Correspondingly, private sector surplus will decrease from more than 8% in 2009 to 2.4%, 4.4% and 3.5% of GDP. Detailed results are included in Appendix 3.

6.2 Discussion and Limitations

The projection results show that China's private sector balance will return to a level that is similar to the period from 1996 to 2004. One of the worries for China's rebalance towards domestic consumption is inflation. Referring to the time between 1996 and 2004, when private consumption as cumulative share of GDP and private sector surplus are both similar to projected magnitude, we do not see any sign of inflation. Retail prices index were very stable; consumer price index actually experienced deflation of up to 5% in 1996 before turning positive in 2000 and inflated at 1 to 2% rate; producer price index went through even more pronounced deflation of more than 10% in 1996.

Regarding current account balance, external sector will resemble those of 1980s and 1990s when both surplus and deficit could arise. If trade deficit indeed arises, China will have a chance to reduce its huge foreign exchange reserve. In fact, trade deficit may not be as far away as we may think. The latest news shows that China has already registered a quarterly trade deficit of $1.02 billion in the first three months of 2011 as compared with a surplus of $13.9 billion a year earlier. This is a sign that China's rebalancing is advancing rapidly as this project is being written.

Finally, public sector balance projection represents uncharted water for China. Although the Chinese government is unlikely to have any difficulty in paying for the deficit as discussed before, the task of financing a larger deficit can be very interesting for China. For instance, financing the deficit by issuing RMB denominated bonds in the international market is a good way of promoting the use of the currency outside China. It also provides an opportunity for China to find more varied ways of using its foreign exchange reserve.

Through the discussion, it has become clear that the projection results presented here is very much dependent on the results from the literatures I have borrowed. Even though the literatures might be right when they were written, or are still valid now, there is no guarantee that those relationships will be stable for the fifteen years of projection period. In fact, in an economic environment that is changing as quickly as China, it is more likely that the relationships I have built the projection on will change rather than not change. Nevertheless, applying the macroeconomic identity on the Chinese economy has provided us some insights on where China should go from now and what can be done.

Moreover, although the China miracle has been around for three decades now, it is still a very short timeframe for academic advances. As results, much of the time series data need to be improved, and much of the literatures I have dealt consist of working papers. With more effort and better data, I am sure China's experience will provide an excellent case study for the advances of the subject.

Appendix 1 – Macroeconomic identity derivation

Given identities:
Gross National income (Y) = GDP + net income from abroad (NY)
(1) Y = GDP + NY

GDP = private expenditure (PE) + government expenditure (GE) + net exports (NE)
(2) GDP = PE + GE + NE

Disposable income to private sector (YD) = Y – tax to government (T) + net transfer from foreign sector (NT)
(3) YD = Y - T + NT

From (1) and (2):
(4) Y = PE + GE + NE + NY

From (3) and (4):
(5) YD = (PE + GE + NE + NY) – T + NT

Rearrange (5):
YD + T = PE + GE + (NE + NY + NT)
(YD - PE) + (T - GE) = (NE + NY + NT)

Private sector balance + Public balance = Current Account Balance
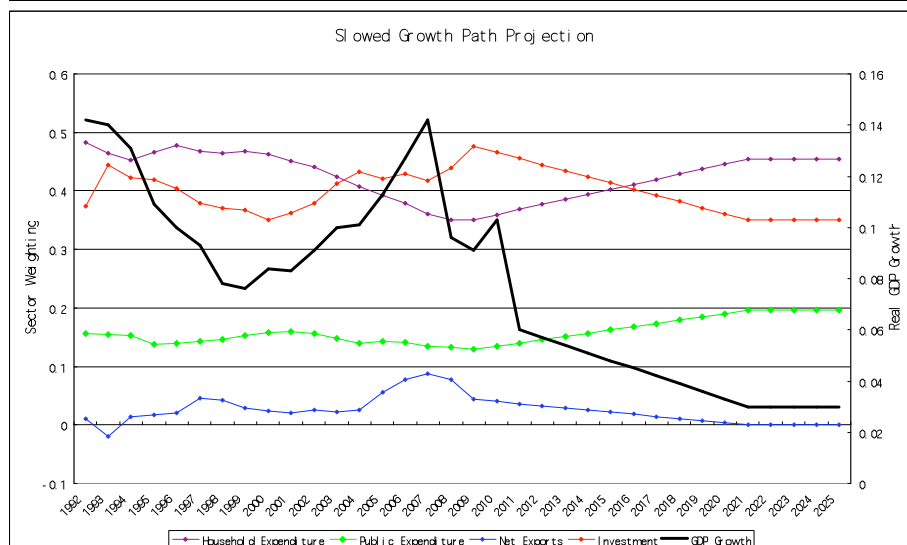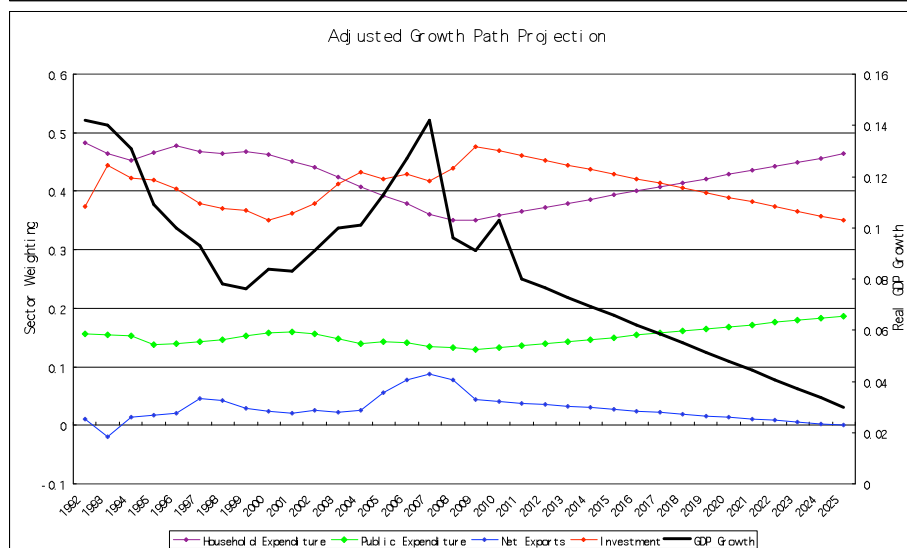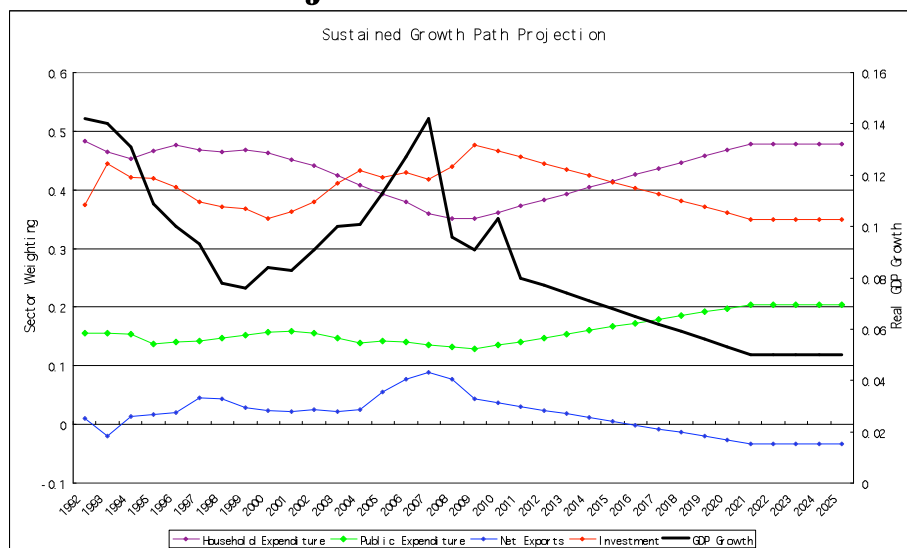
Appendix 2 - Imports and exports by commodity

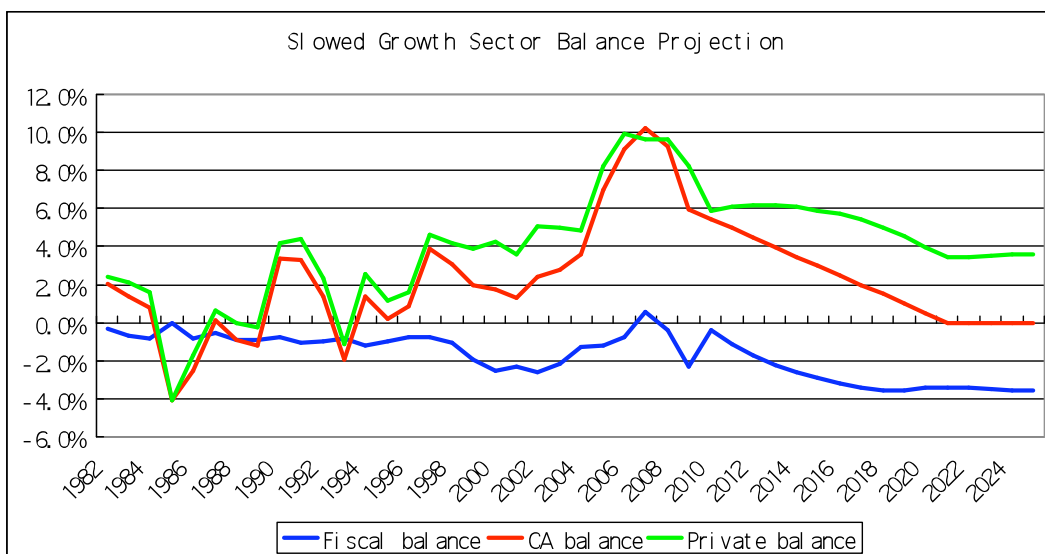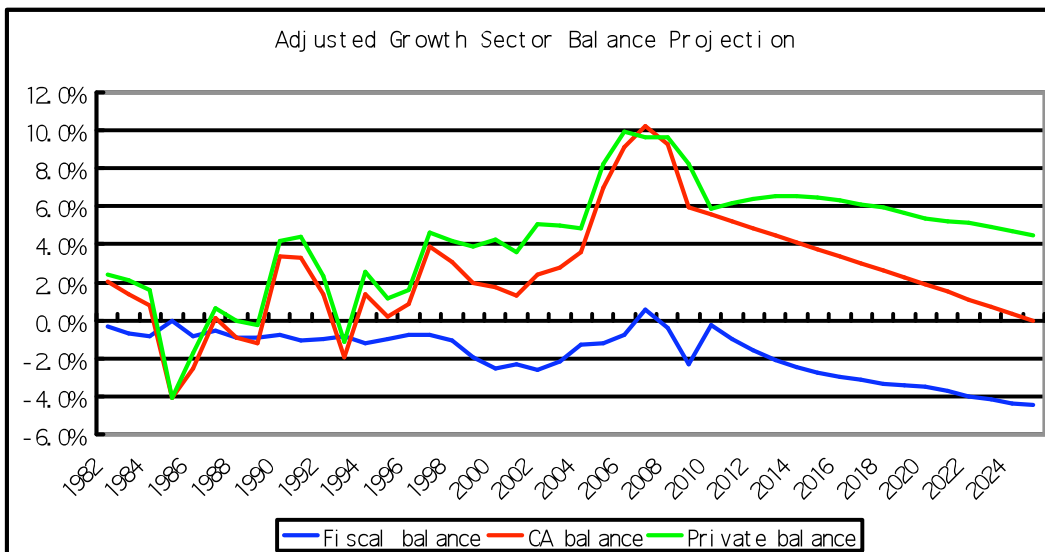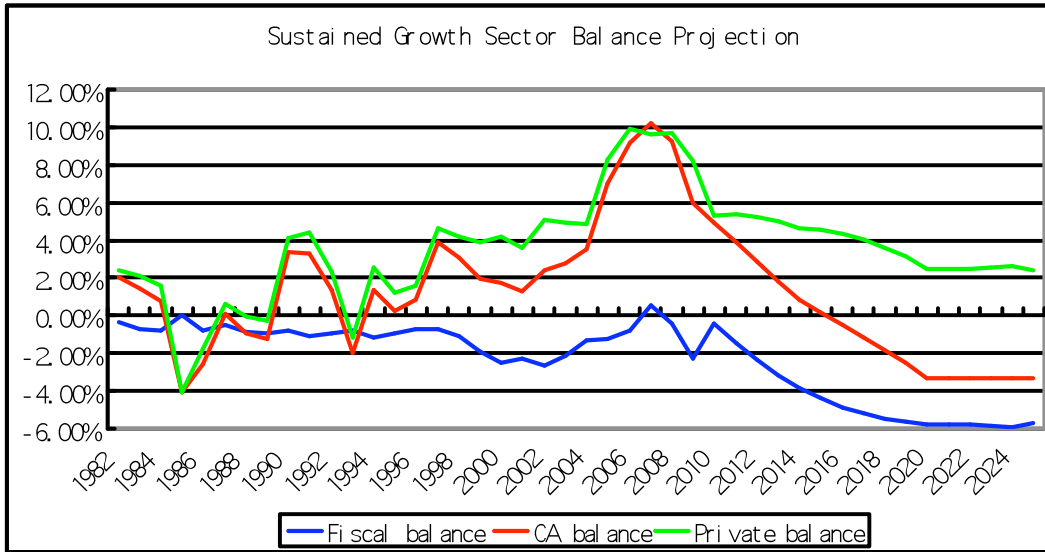| Imports	Primary Goods	Food	Beverages	Raw Materials	Fuels & Minerals	Animal Products	Manufactured Goods	Chemicals	Industrial Products	Machinery	Miscellaneous
1990	18.5%	6.3%	0.3%	7.7%	2.4%	1.8%	81.5%	12.5%	16.7%	31.6%	20.8%
1991	17.0%	4.4%	0.3%	7.8%	3.3%	1.1%	83.0%	14.5%	16.4%	30.7%	21.3%
1992	16.4%	3.9%	0.3%	7.2%	4.4%	0.7%	83.6%	13.8%	23.9%	38.9%	6.9%
1993	13.7%	2.1%	0.2%	5.2%	5.6%	0.5%	86.3%	9.3%	27.4%	43.3%	6.2%
1994	14.3%	2.7%	0.1%	6.4%	3.5%	1.6%	85.7%	10.5%	24.3%	44.5%	6.4%
1995	18.5%	4.6%	0.3%	7.7%	3.9%	2.0%	81.5%	13.1%	21.8%	39.9%	6.8%
1996	18.3%	4.1%	0.4%	7.7%	5.0%	1.2%	81.7%	13.0%	22.6%	39.4%	6.6%
1997	20.1%	3.0%	0.2%	8.4%	7.2%	1.2%	79.9%	13.6%	22.6%	37.1%	6.6%
1998	16.4%	2.7%	0.1%	7.6%	4.8%	1.1%	83.6%	14.4%	22.2%	40.5%	6.6%
1999	16.2%	2.2%	0.1%	7.7%	5.4%	0.8%	83.8%	14.5%	20.7%	41.9%	6.7%
2000	20.8%	2.1%	0.2%	8.9%	9.2%	0.4%	79.2%	13.4%	18.6%	40.8%	6.4%
2001	18.8%	2.0%	0.2%	9.1%	7.2%	0.3%	81.2%	13.2%	17.2%	43.9%	6.9%
2002	16.7%	1.8%	0.1%	7.7%	6.5%	0.6%	83.3%	13.2%	16.4%	46.4%	7.2%
2003	17.6%	1.4%	0.1%	8.3%	7.1%	0.7%	82.4%	11.9%	15.5%	46.7%	8.3%
2004	20.9%	1.6%	0.1%	9.9%	8.6%	0.8%	79.1%	11.7%	13.2%	45.0%	9.2%
2005	22.4%	1.4%	0.1%	10.6%	9.7%	0.5%	77.6%	11.8%	12.3%	44.0%	9.5%
2006	23.6%	1.3%	0.1%	10.5%	11.2%	0.5%	76.4%	11.0%	11.0%	45.1%	9.3%
2007	25.4%	1.2%	0.1%	12.3%	11.0%	0.8%	74.6%	11.3%	10.8%	43.1%	9.4%
2008	32.0%	1.2%	0.2%	14.7%	14.9%	0.9%	68.0%	10.5%	9.5%	39.0%	9.0%
2009	28.8%	1.5%	0.2%	14.1%	12.3%	0.8%	71.2%	11.1%	10.7%	40.5%	8.8%

Source: China SYB 2010 (numbers are quoted as percent of total imports value)

Exports	Primary Goods	Food	Beverages Tabacco	Raw Materials	Fuels & Minerals	Animal Products	Manufactured Goods	Chemicals	Industrial Products	Machinery	Miscellaneous
1990	25.6%	10.6%	0.6%	5.7%	8.4%	0.3%	74.4%	6.0%	20.3%	9.0%	39.2%
1991	22.5%	10.0%	0.7%	4.8%	6.6%	0.2%	77.5%	5.3%	20.1%	9.9%	42.1%
1992	20.0%	9.8%	0.8%	3.7%	5.5%	0.2%	80.0%	5.1%	19.0%	15.6%	40.3%
1993	18.2%	9.2%	1.0%	3.3%	4.5%	0.2%	81.8%	5.0%	17.9%	16.7%	42.3%
1994	16.3%	8.3%	0.8%	3.4%	3.4%	0.4%	83.7%	5.2%	19.2%	18.1%	41.3%
1995	14.4%	6.7%	0.9%	2.9%	3.6%	0.3%	85.6%	6.1%	21.7%	21.1%	36.7%
1996	14.5%	6.8%	0.9%	2.7%	3.9%	0.2%	85.5%	5.9%	18.9%	23.4%	37.4%
1997	13.1%	6.1%	0.6%	2.3%	3.8%	0.4%	86.9%	5.6%	18.8%	23.9%	38.6%
1998	11.2%	5.7%	0.5%	1.9%	2.8%	0.2%	88.8%	5.6%	17.7%	27.3%	38.2%
1999	10.2%	5.4%	0.4%	2.0%	2.4%	0.1%	89.8%	5.3%	17.1%	30.2%	37.2%
2000	10.2%	4.9%	0.3%	1.8%	3.2%	0.0%	89.8%	4.9%	17.1%	33.1%	34.7%
2001	9.9%	4.8%	0.3%	1.6%	3.2%	0.0%	90.1%	5.0%	16.5%	35.7%	33.0%
2002	8.8%	4.5%	0.3%	1.4%	2.6%	0.0%	91.2%	4.7%	16.3%	39.0%	31.3%
2003	7.9%	4.0%	0.2%	1.1%	2.5%	0.0%	92.1%	4.5%	15.7%	42.8%	29.0%
2004	6.8%	3.2%	0.2%	1.0%	2.4%	0.0%	93.2%	4.4%	17.0%	45.2%	26.5%
2005	6.4%	3.0%	0.2%	1.0%	2.3%	0.0%	93.6%	4.7%	16.9%	46.2%	25.7%
2006	5.5%	2.7%	0.1%	0.8%	1.8%	0.0%	94.5%	4.6%	18.0%	47.1%	24.8%
2007	5.1%	2.5%	0.1%	0.7%	1.6%	0.0%	94.9%	5.0%	18.1%	47.4%	24.6%
2008	5.4%	2.3%	0.1%	0.8%	2.2%	0.0%	94.6%	5.5%	18.3%	47.1%	23.6%
2009	5.3%	2.7%	0.1%	0.7%	1.7%	0.0%	94.7%	5.2%	15.4%	49.1%	25.1%

Source: China SYB 2010 (numbers are quoted as percent of total exports value)

Appendix 3 – Projection results

Sustained Growth Path Projection

Adjusted Growth Path Projection

Slowed Growth Path Projection

Sustained Growth Sector Balance Projection

Adjusted Growth Sector Balance Projection

Slowed Growth Sector Balance Projection

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