

CHINA'S GOVERNMENT DEBT: HOW OFF BALANCE SHEET
LIABILITIES DRASTICALLY CHANGE THE PICTURE

by

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CHINA'S GOVERNMENT DEBT: HOW OFF BALANCE SHEET
LIABILITIES DRASTICALLY CHANGE THE PICTURE

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ABSTRACT

This paper focuses on China's response to the 2008-2009 financial crises, and how its overall level of debt rose through off-balance sheet funding. The paper attempts to paint a more accurate level of Chinese debt through postulating the amount of off-balance sheet liabilities from local Chinese governments and adding it to the central government's debt level. I obtained estimates of local government debts (which are not reported by the central government) through academic journals, periodicals, and economic websites to unveil China's debt levels are underreported. From there, I conducted a case study to compare China's debt to GDP against countries that have previously defaulted on their debt and countries that currently pose a high risk of default to see if China is in trouble with regard to its debt. While China is not currently in danger of a sovereign debt crisis, if the current growth rate of China's debt continues, there could be problems in the near future.

TABLE OF CONTENTS

INTRODUCTION	1
LITERATURE REVIEW	7
The Impact of the 2008 Financial Crisis on China	7
The 2009 Stimulus Program	8
Sources of Government Fiscal Risk.....	11
Sources of Chinese Debt.....	12
Direct Explicit Government Debt	13
How do Local Governments Borrow?.....	14
Contingent Liabilities: Passively Involved.....	15
Contingent Liabilities: Actively Involved	18
METHODOLOGY/RESULTS	24
Arriving at a More Complete Picture of Government Debt.....	24
IMPLICATIONS.....	31
CONCLUSION	37
REFERENCES.....	40

LIST OF CHARTS AND GRAPHS

CHART 1: GDP Growth YOY	2
TABLE 1: Sources of Government Risk.....	11
FIGURE 1: How Local Governments Borrow.....	18
TABLE 2: Estimates of LGFVs Debts	23
CHART 2: Chinese External Debt	24
TABLE 3: Estimates of Unfunded Pension Liabilities	25
CHART 3: Public University Debt.....	27
CHART 4: Revised Estimate of 2013 Chinese Debt.....	28
CHART 5: Five Year CDS Spreads vs. Debt/GDP	29
CHART 6: 2013 Debt/GDP of Selected Countries.....	31
CHART 7: Debt/GDP Growth in China (projected)	33
CHART 8: Debt/GDP in Crisis Countries vs. China.....	34

INTRODUCTION

Debt has long been a cornerstone of financing for sovereign governments. While there is nothing inherently wrong with debt, and there are actually many benefits for using it to finance growth, debt also exposes foreign governments to fiscal risks in the form of interest payments and the repayment of principal. If one cannot service its debt, they run the risk of adding more debt to finance their present debt, which can lead to long term problems.

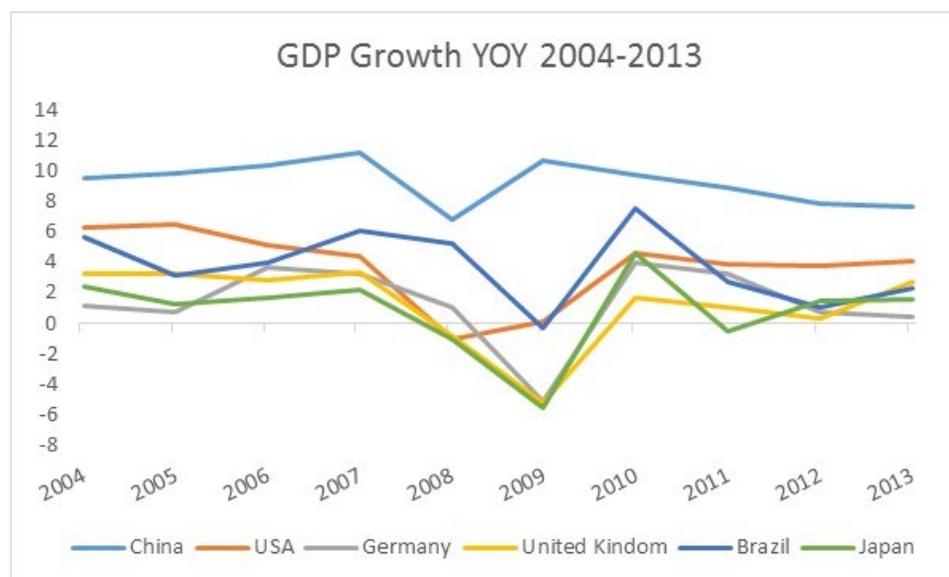
What is the function of national debt? According to Martin & Waller (2012), when governments spend more than they receive in tax revenue during a given period, they must finance the shortfall by borrowing. In this instance, the shortfall is called a deficit. If a government generates more revenue than it spends, there is a surplus, which is used to pay off existing debt. Thus, the national debt is the sum of the current and all past surpluses and deficits (Martin and Waller, 2012).

Governments choose to spend more than they earn in tax revenue to consume more today at a cost of consumption that is less than it would be in a future date, and while this can lead to growth in the economy, it can also lead to the rolling over of debt (issuing new debt to pay for existing debt). If this cycle continues on a large scale for an extended period of time, countries run the risk of credit crises, and potential default.

As seen in recent years, sovereign governments are not invincible from the crippling effects of high debt. The European Union has faced a multi-year recessionary period due to fear of debt in countries like Greece, Ireland, and Italy. Argentina faced a debt crisis in the early 2000s, and its economy has been fighting to

get back on track ever since. In today's global economy, shocks to particular countries can stifle markets and economic progress on a worldwide stage.

In 2008 debt was the cause of one of the biggest recessions in United States history. While it was individual debt in the form of subprime mortgages, and not government debt, that caused this recession, the effects were felt worldwide. As the housing market collapsed, the US economy spiraled downward, and the ripple effects were felt throughout the globe. According to Bloomberg, year over year GDP growth dropped in almost every major economy during the recession, as shown in Chart 1. While these countries have rebounded since the United States' "Great Recession", 2008 highlighted the susceptibility of foreign economies to downturns in other markets.



*Chart 1, Source: Bloomberg

While many countries struggled to sustain growth during this turmoil, one country of note did not see its GDP dip into a recession during the 2008 crisis - China. In recent years, China has emerged as one of the most important, if not the most important economy in the world. According to the IMF, China has the world's

2nd highest nominal GDP of over \$8.2 trillion and GDP growth rates that have been between 7.7% - 10.4% over the past five years, indicators that China has undoubtedly earned their place as a major player in the world economy.

In reaction to the global recession of 2008, China enacted a stimulus program, which included 4 billion RMB of debt, to spur its economy through troubles in the global market, specifically targeted at infrastructure investment (He, Zhang, and Zhang, 2009). The plan worked, with China's GDP expanding from \$6.162 trillion to \$6.747 trillion to \$7.502 trillion from 2008-2010 (Bloomberg). While the short-term effects have been positive, there are fears over the potential long-term effects on the world's second-largest economy. This plan exposed China not only to explicit debt liabilities, through the form of central government debt, but also encouraged spending from local governments in China, which has been financed through various off-balance sheet tactics, broadly called "contingent liabilities".

Contingent liabilities, as defined in a pure accounting sense, are liabilities that are paid only if a particular circumstance occurs. The idea is fairly simple, and occurs on a personal, corporate, and national level almost daily. Consider the following example: when I rented my first house, I signed a contract guaranteeing I would pay rent each month. My parents, however, also signed this contract, to attest they would finance the payments in case I did not. This, in essence, created a contingent liability on their behalf. Because there isn't a 100% probability the liability will have to be serviced, contingent liabilities are not reported on balance sheets, including for governments. This can leave a skewed view of the actual

amount of debt a country is facing. Investors, economists, and policy makers closely monitor the amount of debt a country faces, especially in relation to that country's GDP to understand how well an economy will be able to service its future debts.

This paper will examine China's economy, including how the 2008 financial crisis affected China, China's response to the crisis through its 2009 stimulus, and how off-balance sheet liabilities in local China may present a significant risk for China's debt levels. Through research from academic journals, financial publications, the IMF, World Bank, and Chinese Central Bank data, the paper will posit the actual level of Chinese debt, and compare it to countries that have faced sovereign debt crises in the past.

The goal of this paper is to answer the following question: How much debt does China have, and is it something to be worried about? While the question is fairly straightforward, finding an answer demands a complex understanding of Chinese economic history, sources of debt financing, global perspective, and most of all, challenging the notion that data from a national government should not necessarily be taken at face value.

While 2013 provided banner worthy returns in equity markets, the world's economic outlook is still perplexing. Many countries appear to be on the road to recovery, but even moderate noise seems to cause sudden investor pullback, a sign of confusion, and potentially skepticism in the recent economic rebound. On June 20th, former Fed Chair Ben Bernake's statement that interest rates may rise in the future saw the 10 year treasury jump to a then two year high, and saw the S&P 500 drop by 2.5%, the largest one day drop since November 2011 (Rooney, 2013).

Recent news out of Ukraine has caused markets to stagnate for most part of the first quarter (Solomon, 2014). While each of these were noteworthy events, they would likely be blips on the radar if China faced a serious debt crisis in the future.

As mentioned before, the 2008 United States recession sent ripple effects through the world economy. While China might not be on the same level as the United States economically (yet), it is recognized as one of the world's major economies. With GDP growth rates hovering in high single digits, and occasionally low double digits over the past 10 years, China's trajectory has led the Center for Economics and Business Research (CEBR) to predict China will overtake the title of the world's largest economy by 2028 (Holliday, 2013). Suffice to say, major news out of China would be major news worldwide. Therefore, the health of China's balance sheet has no one single stakeholder, but rather is a question of interest to policy makers, economists, investors, and all participants in the world economy. If a large enough shock to China's economy occurred, it would be felt not only by the world's largest organizations, businesses, and governments, but would have trickle down affects to consumption, saving, and thought on an individual level.

While an exact answer to the amount of Chinese debt is complex, and potentially impossible (due to the lack of transparency in local China) to obtain, it is possible to make an educated assumption at how much total debt China carries. The best place to start is on China's "balance sheet", where direct and explicit liabilities can be found through the Chinese Central Bank. I put "Balance Sheet" in parenthesis due to the fact that this is a purely conceptual idea, according to Currie and Velandia, because governments' main financial reports are the budget and estimate

of public sector borrowing required to finance the budget (Currie and Velandia, 2002). From there, we can then try to estimate China's exposure to contingent liabilities. Academics and economists alike have speculated at the amount of China's off-balance sheet debt, and through current consensus estimates on the level of different types of contingent liabilities, we can begin to paint a clearer picture of China's current debt level. In addition to these tactics, there are also ways to compare China's debt to debt of other countries by properly interpreting Credit Default Swap (CDS) spreads. CDSs are used as protection for the potential default of any given bond. The CDS owner pays a certain amount, depending on the riskiness of the bond, called the spread, which measures the implied amount of risk an investor is willing to take for guaranteeing the payment of principal if China's debt were to default (Pan, Singleton, 2008). For example, if China's CDS spread was 50 basis points, and five other countries had CDS spreads of 50 basis points, and these countries had an average debt to GDP ratio of 75%, one could posit China's true debt level is its current GDP multiplied by 75%. There are inherent shortcomings to this method because there are numerous other criterion for default on government bonds, including political risk, higher interest rate spreads, and the level of development in a particular economy (Cuadra & Saprizam, 2008). Furthermore, according to Longstaff, Pan, Pedersen, and Singleton, CDS spreads movements can be at least partially attributed to movements in local and foreign stock markets, because these can be viewed as a sign of strength or weakness in a particular country's or the global economy (2011). These examples show the flaws of using CDS spreads to extrapolate a single variable. Because this paper will use this method

purely for comparative purposes to see if the new level of debt posited is in the same ballpark as the estimated figure, we will use it anyway, despite its shortcomings.

Once a reasonable figure for China's debt level has been evaluated, we can move to comparing this debt level to other countries that have faced sovereign debt crises in the past. While history isn't necessarily an indicator of the future, and differences between economies won't present a perfect comparable, this analysis will let us consider how serious China's current or future situation might become.

LITERATURE REVIEW

The Impact of the 2008 Financial Crisis on China

The 2008 financial crisis was felt throughout the world, and China was no exception. While China was able to maintain relatively high growth rates throughout the crisis, the negative effects from the crisis on China were considerably stronger than is often realized. Between 2005 and 2007, China's stock market increased fivefold, but starting in October 2007, the stock market in China crashed, wiping out more than two thirds of its value (Li, Willett, Zhang, 2012). Furthermore, China saw its exports fall in November 2008 by 2.2%, the first time this had happened since 2001. Imports also were hit, as December of 2008 saw a decline of 21% from November imports (Schmidt, 2009). According to Yongding, China was also exposed to direct losses in the American capital market. China's commercial banks had bought a moderate amount of mortgage-backed securities and collateralized debt obligations, and China's four most important commercial banks lost approximately \$20 billion USD on these investments (Yongding, 2010). While GDP growth in China

was still large compared to most economies, China's annualized third quarter GDP growth dropped from 13% in 2007, to 9% in 2008. (Yongding, 2010). It is clear through these findings China struggled, like many other countries, to find its footing during the 2008 crisis. The next section outlines China's biggest response to combat the effects felt by the 2008 crisis, through one of the largest stimulus packages China had ever enacted.

The 2009 Stimulus Program

While the Chinese government had long been wary of using debt to finance growth, the speed and depth of the economic downturn in 2008 led them to reconsider its previous paradigm. The Chinese government responded vigorously with an expansive 4 trillion RMB (around \$586 billion USD) stimulus package, which had layers of complexity. According to Barry Naughton's extensive paper on China's 2009 stimulus program, the overall stimulus program can be broken down into three interrelated components: an investment plan, a set of funding mechanisms, and a series of industrial policies (2009, p. 1).

The document that outlined this program, *Central Document No.18 of 2008*, has never been openly published, although its contents have been abstracted. The document urged local governments to aggressively adopt the measures outlined in the plan, with the main goal of increasing domestic demand. Local leaders were eager to receive their new orders, and many provinces felt the opportunity to seize favorable opportunities created by expansionary fiscal policy was of the utmost importance. Naughton's paper explicitly mentions a quote he obtained from a Wugong County meeting to discuss the Central Document's contents, "We must

concentrate our forces and act quickly, strengthen our links with the provincial and municipal authorities, and make sure that more key point investment projects come to our county...Getting more project funding is our top current task.” We must be mindful, according to Naughton that meetings like this were undoubtedly being held in hundreds of cities across China in mid-November (2009, p. 3). This opportunistic view contributed to local governments aggressively seeking funding in any way possible.

Under the *Central Document No.18 of 2008*, local-level governments were to bargain to the central governments for projects the local government’s wanted to accomplish. The central government gave provinces a rough idea of the amounts of money to expect based on the provinces population and historic degree of reliance on central government investment. According to a *Caijing Magazine* article referenced in Naughton’s paper, local provinces had little or nothing to lose in the process of proposing projects, which caused them to propose many more projects than could be completed. In fact, within a month of initiating the project, 18 provinces had proposed projects with a total budget of 25 trillion RMB (2009, p. 3), much more than the original 4 trillion RMB promised in the stimulus package. When the central government distributed money to provinces with a list of approved projects, the money was far from enough to fund all the projects, because the local governments pledged to come up with “matching funds”, to finance the shortfall. According to a China CBN article mentioned by Naughton, in 2008-2009, the central government expected to give 588 billion RMB to localities for the investment plan, while the local governments expected to put in around 600 billion. As we can see,

local governments felt pressure to capitalize on the lending from the central government, which many times led to overly aggressive measures from the local governments in terms of matching funds (2009, p. 4).

Naughton also explained that because of the central government's stimulus efforts, bank credit grew at an explosive pace. In the first quarter of 2009, bank loans increased by 4.6 trillion RMB. To put this in perspective, credit in China had grown at approximately the same pace, at around 5.3% of GDP between 2002 and 2008. In the first quarter of 2009, it grew by 15.3% of GDP (2009, p. 5).

While these measures seemed like positive steps to spur the domestic economy, one problem remained, which was many of the investments were in infrastructure and public goods, which have low income-earning potential (Naughton, 2009, p. 7). This is important to note, because it leaves the central government exposed to repayment issues in the future due to insufficient cash flows. Furthermore, it is clear the Chinese stimulus was much more than the announced 4 trillion RMB. Nevertheless, the original number has remained a staple of Chinese economic discussion. According to Naughton, this has drawn criticism of outsiders, who believe the Chinese government promoted this number to not draw fear from Chinese consumers, and lead to an economic downturn (2009, p. 6). The 2009 stimulus program can clearly be seen as one of the launching points for local government spending, as it seemed expected of these governments to help curtail any headwinds that might occur from the global recession happening in other countries around the world. As we will see in the sections to follow, local governments' exposure to debt and risk came in very interesting and creative ways.

Sources of Government Fiscal Risk

Governments have taken out debt for hundreds of years. There is nothing explicitly wrong with debt, and in many instances, debt can be used to finance growth that might not have been achievable otherwise. While debt can be used to help an economy grow, there are also certain risk factors associated with debt. According to Polackov, these sources of risk can be direct or contingent, and either explicit or implicit. She then classified government debt into four types stemming from her original four criteria of risk: direct explicit debt, direct implicit debt, contingent explicit debt, and contingent implicit debt (Polvackov, 1999). Table 1, which is adapted from Polvackov's article, *Contingent Government Liabilities: A Hidden Fiscal Risk*, is presented below to provide more color on each type of liability.

Liabilities	Direct (Obligation in any event)	Contingent (Obligation if a particular event occurs)
Explicit (Recognized by law or contract)	i.e. - Bonds, Budgetary Expenditures	i.e. - state insurance
Implicit (An obligation of government that reflects public pressures)	i.e. - public pensions, social security	i.e. - defaults on subnational government, public entities non guaranteed debt

*Table 1. Source: *Contingent Government Liabilities: A Hidden Fiscal Risk*

China's debt consists largely of the contingent liabilities described above. While it's hard to perfectly describe the stage of China's economy, many still consider it developing/emerging. If this is the case, Kharas and Mishra's findings that hidden deficits are large in developing countries, and at times larger than the

conventional budget deficit (Kharas & Mishra, 2001), may shed light on China's current situation. These hidden deficits, unless they were never going to be paid, would likely be funded through hidden liabilities, which we will focus on uncovering throughout this paper.

Sources of Chinese Debt

While China is exposed to direct and explicit debt attributable to the central government, one of the most interesting components of China's debt situation is that a large portion of this debt is attributable to local governments, even though local governments are legally precluded from borrowing. According to Gordon and Li, even though local governments differ in structure from states in America, they both have a responsibility to provide public services, infrastructure, and education (Gordon and Li, 2011). These three areas are where we will examine a majority of the off balance sheet activities in these local governments. According to Jin and Zou, prior to 1994 budget deficits in local governments were financed through credits from the People's Bank of China, and external debt revenues. This changed with the passing of the 1994 Budget Law, which stated budgets at all levels of government should be balanced. The law also put harsh penalties on local governments that didn't follow this rule, as they would face administrative prosecution if they were not in compliance (Jin and Zou, 2003). Therefore, under the current system of public budgeting, only direct and explicit liabilities are accounted for on the budgets of governments, because local governments would not have the need to borrow from contingent sources under a balanced budget (Ma, 2013). While legally restricted, there are still ways for local governments to obtain financing. Although local

governments do not have explicit debt, their exposure to debt comes mainly from investment companies, also known as local government financing vehicles (LGFVs). While there are no official statistics on China's local government debt and no consensus on the size of local government debt (because contingent liabilities are off balance sheet), many scholars have posited about the exact number (Li and Lin, 2011). Estimates taken from *The Size and Structure of China's Government Debt* on the size of LGFV debts state numbers as low as 7.38 trillion RMB from Mingkang Liu, the Chairman of the China Banking Regulatory Commission, and 8 trillion RMB by Kang Jia. Others have claimed this number is closer to 11.4 trillion RMB, with further commitments totaling 12.7 trillion RMB (2011, p. 528). Reports from China have indicated local government debts are much smaller number than many others have claimed, which makes one wonder about either the a) accuracy, or b) full comprehension of the size and scope of LGFV debts from Chinese officials. Further examination of LGFV debts will be discussed in depth later in this paper.

Direct Explicit Government Debt

According to Li and Lin, China's direct explicit government debt includes central government fiscal debt, the accumulated bonds issued for financing budget deficits, and foreign debt accumulated from borrowing from foreign governments and commercial banks (Li and Lin, 2011).

Chinese external government debt has typically been small, because the Ministry of Finance allowed the financing of budget deficits through borrowing from the People's Bank of China. In the early 1990s, however, the government passed a law preventing the Ministry of Finance from financing deficits from the Central

Bank, which caused a surge in government debt (Li and Lin, 2011). According to Li and Lin, domestic outstanding debt increased from 89.03 billion RMB in 1990, to 5,973 billion RMB in 2009, highlighting the massive increase in outstanding domestic debt caused by the Central Bank's decision to no longer finance deficits (2011).

According to Lin, foreign debt comes from foreign government loans, loans from international financial institutions, and commercial bank loans (Lin, 2003). China had a non-foreign debt policy before the economic reforms in 1978 and started to borrow from foreign countries in the middle of the 1980s. After the 1997 Asian Financial Crisis, China became very cautious about foreign borrowing, and decided to reduce its exposure to international markets. Li and Lin's paper presents a table that shows foreign debt/GDP, and how it reduced from 13.75% in 1997, to 8.73% in 2009 (Lin and Li 2011, p. 530). This is interesting to note, because it shows the reliance on domestic debt to finance deficits in China. I believe this has contributed in some degree to the off balance sheet debts in local China, because the central government would rather be exposed to its own debts, as opposed to debt in foreign markets.

How do Local Governments Borrow?

As mentioned previously, Chinese local governments are precluded from borrowing and offering guarantees for borrowing, but there is no doubt local governments in China are exposed to contingent liabilities. According to a 2011 National Audit Office Report, of 2,779 county-level governments, only 54 had not borrowed any money (NAO, 2011). Until the past decade or so, the size of local

government debt has not gained much attention. Lin was one of the first to tackle the answer, in which he said conservative estimates put the amount of local debts at 200 billion RMB, or 2.3% of GDP in 2003 (Lin, 2003). Chinese local governments have seen debt increase rapidly in recent years. According to Li and Lin, a research report by China International Capital shows that new loans in 2009 were 3 trillion RMB, and follow-up loans in 2010 and 2011 will be around 2-3 trillion, which would have made local government debts reach 10 trillion by the end of 2011. To add to this, the Chinese Academy of Social Sciences stated local government debt would reach 9-10 trillion RMB by the end of 2010 and would keep rising to 11 trillion in 2011 (Li and Lin, 2011).

This raises the question – if local governments are legally precluded from borrowing, how are they involved in debt finance? For the most part, According to Ma and Liu, as stated in Ma's 2013, paper China's local governments are involved in contingent liabilities in two major ways: a) passively involved, and b) actively involved (Ma, 2013).

Contingent Liabilities: Passively Involved

In this instance, According to Ma, liabilities have been accumulated, but not because local governments have the intention of borrowing. Instead, local governments have become involved with contingent liabilities because of institutional changes or policy transitions (Ma, 2013). The most serious example in China is caused by the redesigning of pension systems in the late 1990s, which has led to large amounts of unfunded pension liabilities. In 1997, China abandoned the pension system established in the planned economy and created a multi-

dimensional pension system for local employees. According to Ma, the system is comprised of two accounts: a social pooling account and individual account. In the social account, premiums are paid by individuals and enterprises into a pool that can be continuously drawn upon for the pensions of retirees. As for the individual accounts, it is expected the premiums deposited by individuals will be saved for paying the pension of that worker upon retirement. However, premiums transferred to the social pooling account have been too small to pay for current retiree's pensions. This has led to local governments taking funds from individual accounts to cover the shortfall (Ma, 2013).

While the restructuring of pension funds contributed to an increased unfunded pension liability, there are other reasons China's pension fund has become more of a problem in recent years. According to Pino and Yermo, pension funds hold financial assets that are supposed to maintain their financial soundness to provide the benefits the pension fund guarantees. Pino and Yermo also collected data on a group of country's pension funds during the recession, where nominal investment returns were as low as -30.40% in Ireland. Of the 20 pension funds presented, only two had positive returns in 2008 (Pino and Yermo, 2010). While China was not cited in this study, it highlights the difficulties pension funds faced during the 2008 recession and does not make it unreasonable to believe China saw its pension assets depreciate during this time frame, which would likely cause an increase in unfunded pension liabilities.

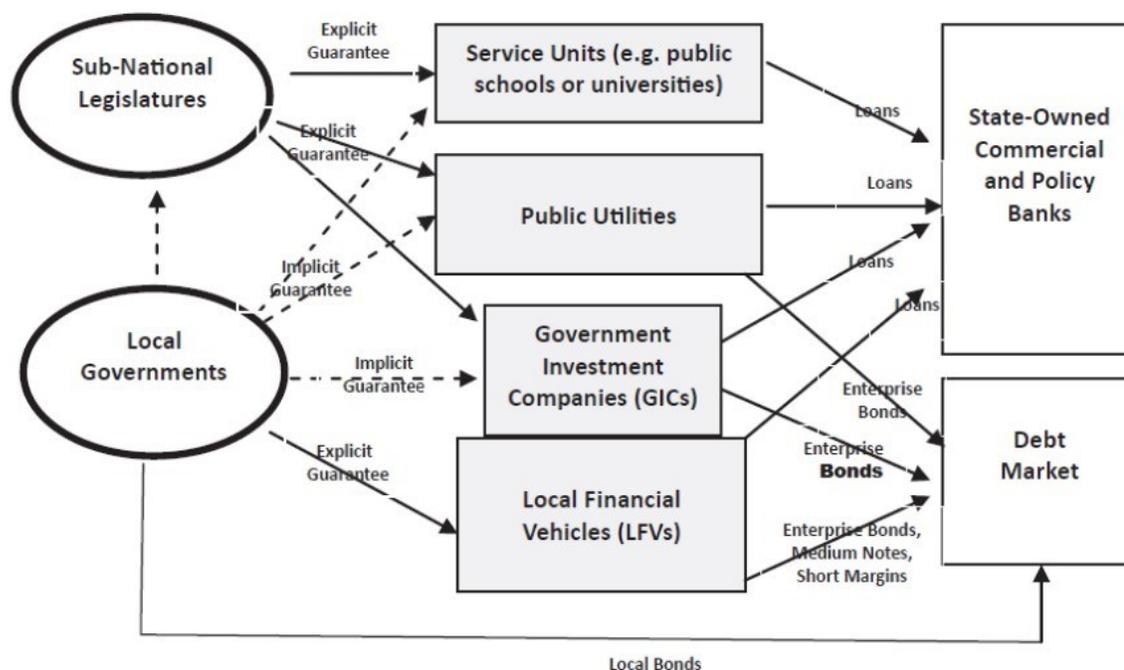
Another reason why China's pension liability is becoming a problem has to do with the aging population in the country. According to Chen, China's 2010 census

revealed population above 60 and 65 years exceed 10% and 7% of the total population, respectively. By 2011, when numbers from the most recent census were reported, that number had grown to 13.3% and 8.9%, respectively (Chen, 2012). As the age of the Chinese population increases, there are more people set to receive pension benefits from the state. Therefore, the pension liability will become greater as more of the fund's assets are used to pay China's elder citizens.

Estimates have varied widely on the amount of unfunded pension liability in China. According to Li et al. from 2012, stated in Ma's paper, the unfunded pension liability was 3.5 trillion RMB in 2010 (Ma, 2013). Chen cited studies from the Ministry of Labor and Social Security in 2005, which stated the liability was 2.2 trillion RMB, and another estimate from the College of Public Administration of Renmin University during that time frame put the number at 8.0 trillion RMB (Chen, 2012). Further estimates have placed this number in a different context. A New York Times article in February 2013 pegged the pension short fall at 2.2 trillion RMB at the end of 2012 (Frazier, 2013). Deutsche Bank estimated the gap between pension assets and liabilities by the end of 2013 to be ~18 trillion RMB (Frazier, 2013), and Barclays estimated this gap to be as high as 35% of 2012 GDP (~18 trillion RMB) (Frangos, 2013). This example highlights the complexity and uncertainty of China's liabilities. While these unfunded pension liabilities are unlikely to show on China's balance sheet, they represent real liabilities that will have to be serviced in the future.

Contingent Liabilities: Actively Involved

The majority of local governments' contingent liabilities have been accumulated by innovations which enable local governments to bypass the Budget and Guarantee Law to borrow money. Figure 1, taken from *Hidden Fiscal Risks in Local China*, summarizes these local government's innovations.



*Figure 1, Source: *Hidden Fiscal Risks in Local China*

One way governments have obtained funding, according to Ma, is through public universities, which have turned to commercial and policy banks for loans, with implicit guarantees from local governments (Ma, 2013). In these cases, instead of local governments directly taking out money, which is then put into schools, universities borrow directly from banks, with the guarantee of repayment provided by local governments. The amount of these loans escalated at an extraordinary pace from 2003-2006. In 2003, according to *The Blue Book of China's Society*, it was estimated public universities loaned 150-200 billion RMB, which subsequently

increased to 450-500 billion RMB in 2006 (Li and Lin, 2011). If this annualized growth rate of approximately 35.7% maintained, university loans would approach 4,241 billion RMB in 2013, which would account for 7.45% of GDP. The only other estimate of pension liability I found was a quote from Lin Liyun, a senior official with the National Audit Office of China, who stated total university debt was 263 billion RMB at the end of 2010 (Sharma, 2011). While I don't want to completely discredit this estimate, most of my research has found every estimate from Chinese officials are dramatically lower than ones from third parties. These public university debts could potentially present another avenue for research in the future, due to the lack of available estimates for the time being.

Regardless of the exact size of these loans, they represent a growing concern for the Chinese government. According to *21st Century Business Herald*, most of these universities income goes to paying interest on outstanding bank loans (China Daily, 2007). Also, according to article in *University World News*, Guo Shenglian, deputy governor of Hubei province in China, suggested some universities could be forced to shut as early as 2015, unable to service their debts (Sharma, 2011). While these debts are indirect liabilities to China's central government, un-serviced loans would surely fall on the shoulders of the Chinese government, assuming they would not want a collapse in their education system.

According to Li and Lin, the expansion of public university debt can be attributed to many factors. Among these, the pressure to improve quality of education, as well as the pressure to keep tuition low were driving factors. In May 1998, the government called for establishing first-class universities on a global

stage. “The 985 Plan” was made, where 40 universities selected by the Ministry of Education received special subsidies. While the idea behind this plan was sound, other universities struggled to catch up to these selected universities. Schools that did not receive subsidies began to make great efforts to improve the quality of their facilities and equipment and to hire quality faculty. This greatly increased expenditures of these universities. To make matters worse, low tuitions have not helped cover these expenses. For example, at Peking University (one of the most prestigious universities in China), the annual tuition is only 5000 RMB, with 1250 RMB for room and board, or the equivalent of approximately \$875 USD per student. These low tuition and room fees cannot cover the expenses associated with running these universities, which leads these universities to turn to commercial banks, which will happily loan money with the full expectation that if the university does not repay the loan, the Chinese government will (Li and Lin, 2011).

The largest amount of contingent liabilities come from local government financing vehicles (LGFVs). LGFVs are complex and diverse in their functions, according to Goodstat. LGFVs carry out many government tasks, especially relating to infrastructure. According to a 2011 study cited in Goodstat’s 2012 paper, the IMF was “unable to describe them (LGFVs) except in such imprecise terms as indirect vehicles to collect bank loans, heavily involved in infrastructure and construction projects and highly dependent on using state-owned assets such as land as collateral” (Goodstat, 2012). Zhang and Barnett reiterated LGFVs’ main purpose as infrastructure vehicles, by describing LGFVs as legally distinct entities that engage in long-term infrastructure projects. In addition, these entities could collateralize

their borrowing with land or other assets owned by the LGFV. Despite legal prohibitions, most LGFV debts are implicitly or explicitly guaranteed by local governments. The perception of a guarantee helps explain why banks have found it attractive to lend to LGFVs. (Zhang and Barnett, 2014).

The 2008 financial crisis gave impetus to the springing up of LGFVs. Worried about the potential negative impacts of the financial crisis to the Chinese economy, the Central Bank of China openly encouraged local governments to create LGFVs to raise funds to stimulate economies (Ma, 2012). The risk associated with LGFVs center around their nature as primarily infrastructure investment vehicles, which, especially in the short term, may not generate sufficient cash flows to service their debt. According to Business Insider, of outstanding LGFV loans in 2010, only 27% were found to have funded projects with sufficient cash flows to repay the loans, 50% must rely on alternative sources (other than cash flows) for loan repayment, and 23% are categorized as high credit risks (Chovanec, 2010). This is especially troubling considering the short-term nature of many LGFV loans. To highlight this point, Goodstat noted that of LGFV loans issued in 2009, 43% would have to be repaid in 2011-2012 (Goodstat, 2012).

Other risk factors attributable to LGFVs are that board members and senior management teams are local government officials, as opposed to businessmen. Also, one of the most important sources of revenue for LGFVs are the financial subsidies or other types of transfer payments provided by the local government, instead of steady cash flows (Luo and Chen, 2013). Despite these risk factors, LGFV have garnered relatively high debt ratings in Chinese markets. In 2011, 14% of LGFV

bonds were rated AAA by Chinese rating agencies, 35% were rated AA+, and 47% were rated AA (Luo and Chen, 2013). Despite these high ratings, fears over LGFVs remain present. “We remain bearish on AA or below rated LGFV notes as they heavily depend on borrowings to repay debts,” said Zhoa Bowe, a credit analyst at Shenyin & Wanguo Securities Co. in Beijing, “once one goes broke, the fall could lead to a domino effect among the weaker LGFVs and cause a systemic risk” (Kim and Li, 2013). In this regard, we see similarities to the 2008 crisis in the United States, where mortgage backed securities on very risky loans were rated as high AAA by some services. When these securities started to default, the entire system began to crumble. While I am in no way implying the MBS’s issued in 2008 are a precursor or even an indicator to the fate of Chinese LGFV bonds, it does provide a historical parallel to judge the potential downside of systemic shocks to a large asset class.

There have been varying opinions on the amount of LGFVs and the size of their liabilities. Survey data from the China Banking Regulatory Commission shows that local governments of all levels had set up 8,221 financing vehicles nationwide by June 2009 (Li and Lin, 2011). According to the NAO, there were 6,576 LGFVs by the end of 2010. Besides borrowing only from banks, as investment vehicles had previously done, LGFVs began to borrow in the bond market (Ma, 2013). The amount of debt carried by these LGFVs has been widely debated. Estimates out of China paint the rosier picture of LGFV debts. According to the NAO of China, outstanding contingent liabilities accumulated in LGFVs amounted to 4.97 trillion RMB in 2010, and grew to approximately 6.97 trillion RMB by June 2013, the Chinese Banking Regulatory Commission estimated these debts at 7.66 trillion and

9.30 trillion RMB at the end of 2011 and 2012, respectively (“China Regulator Bans Lenders From Creating New LGFV Loans”, 2013), and Yang Kaisheng, the President of the Industrial and Commercial Bank of China, stated LGFVs’ debts were around 10.75 trillion RMB at the end of 2012 (Wilson, 2012).

Leading economists, investment banks, and rating agencies seem to not put as much stock in the numbers reported from China. Liu Yuhui, an economist at the Chinese Academy of Social Sciences, told the *New York Times*, “I personally feel that the scale of local debt has already broken beyond 20 trillion yuan...You can say there is a risk of local government debt getting out of control” (Wassener, 2013). Others have placed the amount of LGFV debt at anywhere between 14.5 trillion to 24.1 trillion RMB at the end of 2012. A summary of these findings is found in

Table 2.

Estimates of Local Government Financing Vehicles (LGFVs) Debt					
	2010	2011	2012	2013	
National Audit Office ⁽¹⁾	¥ 4.97				¥ 7.00
CBRC ⁽²⁾		¥ 7.66	¥ 9.30		
Yang Kaisheng ⁽³⁾			¥ 10.75		
Tao Wang, UBS ⁽⁴⁾			¥ 16.50		
Standard and Poors ⁽⁵⁾			¥ 14.50		
Nomura International ⁽⁶⁾			¥ 19.00		
Liu Yuhui, Chinese Academy of Social Sciences ⁽⁷⁾					¥ 20.00
Victor Shih, Northwestern ⁽⁸⁾			¥ 24.10		
Minimum	¥ 4.97	¥ 7.66	¥ 9.30		¥ 7.00
Average	¥ 7.99	¥ 7.66	¥ 15.53		¥ 13.50
Maximum	¥ 11.00	¥ 7.66	¥ 24.10		¥ 20.00

*Table 2, Sources:

(1): cnao.gov.cn

(2): “China Regulator Bans Lenders From Creating New LGFV Loans”, caijing.com.cn

(3): “LGFVs: China’s \$1.7 trillion hangover”, euromoney.com

(4): “China’s Growing Debt Underscores a Need for Structural Reforms”, UPenn

(5): “China’s Local Government Financing Vehicles (LGFV): 7 Things You Should Know About China’s Local Debt Bomb”, ibtimes.com

(6): “The Systemic Risk of China’s Local Government Debt”, Systemic Risk Blog

(7): “Report Warns of Chinese Municipal Debt Risks”, nytimes.com

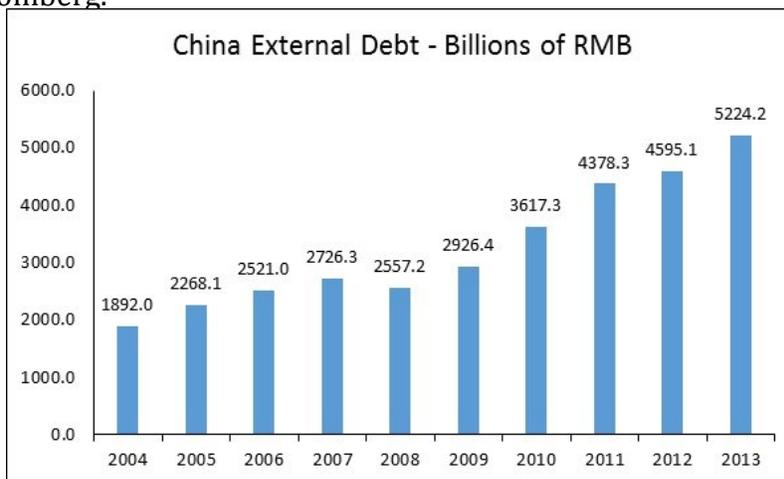
(8): “\$3.9 Trillion of Local Gov. Debt in China...and Counting”, forbes.com

METHODOLOGY AND RESULTS

Arriving At a More Complete Picture of Government Debt

As seen throughout the literature review, arriving at a complete picture of China's debt exposure is complex. It must be stated there are likely shortcomings in the estimate to follow. There are many different sources of debt in every country in the world. For this reason, it would be very difficult to put every source of debt in a single paper. For the purpose of this study, we will be looking at the level of debt by combining external debt, estimated pension liabilities, estimated local government financing vehicle debt, and estimated public university debt, because it is where the bulk of my research was centered. We will be trying to posit the debt from 2013, as it is the most current year with which to compare with government GDP.

The easiest place to start is with the amount of reported debt on China's balance sheet, or the direct explicit liabilities, because it is easiest to find a consensus estimate. At the end of 2013, China's total external debt was 5224.2 Billion RMB. Chart 2 below shows China's external debt from 2004 to 2013, pulled from Bloomberg.



*Chart 2, Source: Bloomberg

From there, we turn to the amount of local debt that needs to be added to China's balance sheet, in the form of contingent liabilities.

We will start at China's unfunded pension liabilities. The amount of unfunded pension liability is the difference between pension assets and pension liabilities.

While not an exact proxy for how much debt the government will have to pay in the future, because assets or liabilities relating to pension funds can both get bigger and smaller, it gives us a reasonable estimate for the potential liability incurred. Table 3 below summarizes the estimates found in the literature review:

Estimates of Unfunded Pension Liability						
		2005	2010	2011	2012	2013
Ministry of Labor & Social Security⁽¹⁾	¥	2.20				
Renmin University⁽²⁾	¥	8.00				
2010 by Li, et al⁽³⁾			¥ 3.50			
New York Times⁽⁴⁾					¥ 2.20	
Deutsche Bank⁽⁵⁾						¥ 18.03
Barclays⁽⁶⁾						¥ 18.00

**Table 3, Sources:*

(1&2): Chen, X (2012). Pension Liabilities and Government Funding Countermeasures in China

(3): Ma, J (2013). Hidden Fiscal Risks in Local China

(4): Frazier, M (2013). No Country for Old Men

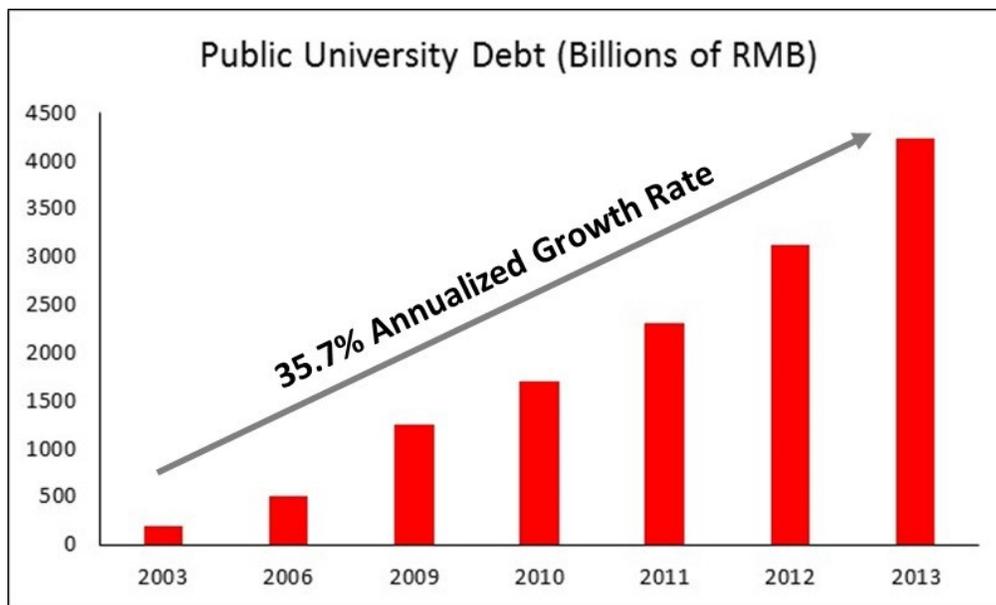
(5): Frazier, M (2013). What Happens When China Goes "Gray"?

(6): Frangos, A (2013). China's Future is Rich with Obligations

As shown in the table, ranges vary widely on the amount of contingent liability China faces due to its pension gap. Barclays stated China's pension liability could be as high as 35% of GDP. This number seems high to me, as Hu Xiaoyi, the Chinese vice-minister of human resources and social security, stated a report that estimated pension liabilities equaling 13 trillion RMB were "groundless" (Dan, 2014). While it is important to note potential bias from a Chinese official, this is still someone who would have more information on the subject matter than most. For

this reason, my estimate of the unfunded liability is 15% of 2012 GDP, or approximately 8.53 trillion RMB. This falls in line with the average of the numbers found in the estimates, which is 8.66 trillion RMB. While an average that spans over eight years and only has six samples might not add great color, based on the estimates I could find, it is in line with my 8.53 trillion estimate.

Public university debt will be estimated using the growth rate from estimates of public university debts from 2003 to 2006, found in Li and Lin's 2011 paper, then applying it to 2013. From 2003-2006, public university debts rose from around 200 billion RMB, to 500 billion RMB, for an annualized growth rate of approximately 35.7%. If this growth rate maintained, local debt would be approximately 4.24 trillion RMB for 2013. As mentioned in the literature review, an estimate out China suggested public university debts in China was lower in 2010 than in 2006 (Shanga, 2011). While this is of note, I am disregarding for my estimation, due to its singular nature. Because of this, my estimate that will be added to total debt will come from the 35.7% growth rate applied to the 2006 estimate from Li and Lin's paper. Chart 3, found on the next page, summarizes my findings.

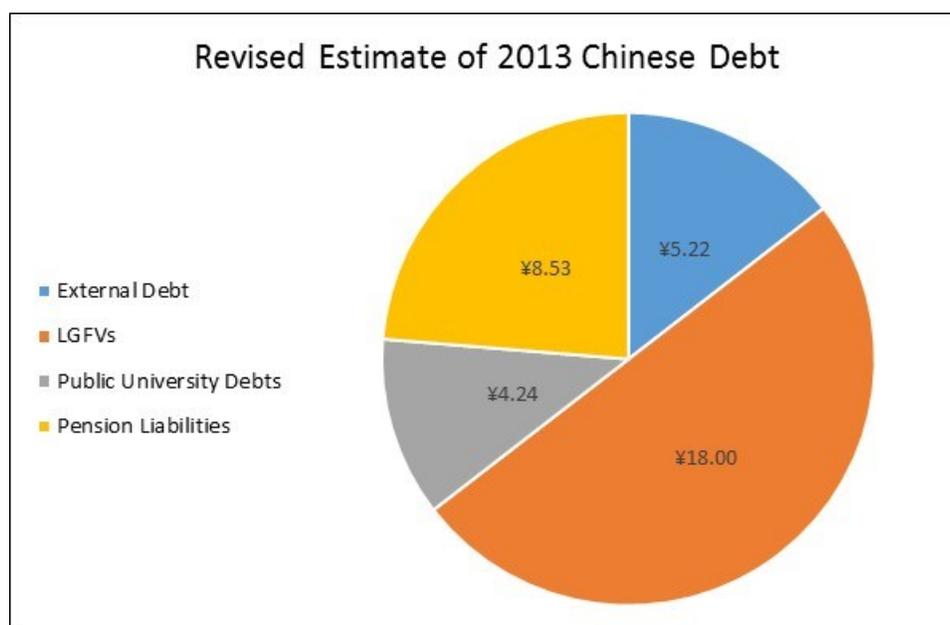


**Chart 3, Source: Li and Lin, 2011, my estimates*

China's LGFV's contribute for the largest portion of local government debt. While Chinese officials don't estimate the magnitude of this debt to be as high as economists, the overwhelming number of economists that believe LGFV debt is much higher than reports from China is worth note. While there are limited estimates on the amount of 2013 debt, Liu Yuhui's estimate that debt could have surpassed 20.0 trillion RMB in 2013 falls slightly above the 2012 estimates provided by economists. Even though this number is almost three times the number reported by the NAO in June 2013, its correlation to other cited numbers gives it value for the purpose of my research. I would like to make note of the quote, which mentions only the possibility of it surpassing 20 trillion RMB, and the trend of the articles I read to be preaching a story of clout, fear, or panic over the Chinese local debt situation, which might lead to these sources reporting numbers on the high end of their estimates. Because of this, I do not want to skew my estimate high in accordance

with articles that may mention large numbers in order to attract page visits. In order to be conservative, I estimate the number at slightly lower than Yuhui's, at around 18 trillion RMB, as it is almost the exact average of 2012 estimates, while also taking a conservative approach to the numbers I saw.

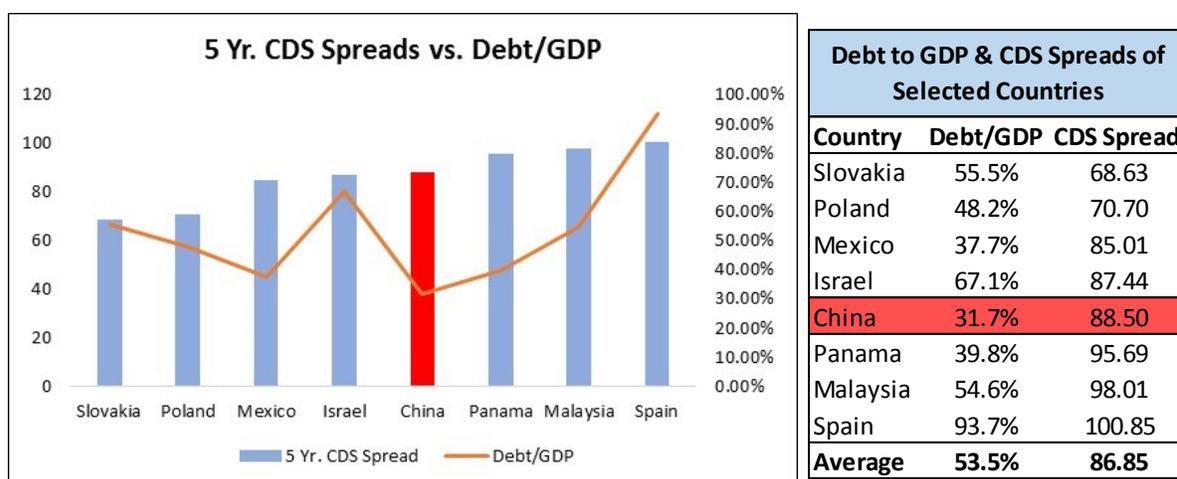
By combining these numbers, which includes 5.22 trillion of external debt, 8.53 trillion of unfunded pension liabilities, 4.24 trillion of public university debts, and 18 trillion of LGFV vehicles, my revised estimate of 2013 debt in China is 35.99 trillion RMB, or 63.25% of GDP. This number is much higher than the reported 31.7% debt/GDP ratio from the Chinese government. Chart 4 summarizes my findings.



**Chart 4, Source: My estimates*

We can also use spreads on credit default swaps as a way to figure out implied government debt to add support to this number. CDS spreads measure how much risk investors believe a country has of defaulting. As spreads rise, it implies the underlying asset (in this case the government bond) carry a greater risk of

default. For the purposes of this paper, we will look at CDS spreads as compared to debt/GDP. As mentioned in the introduction, there are inherent shortcomings for using CDS spreads to extrapolate a single variable. Because the purpose of this method in this paper is only to find a ballpark range to compare with my estimate, and not for a definitive calculation on debt, we will still employ this method. Using Bloomberg's 5-year CDS spreads, a peer group was constructed of countries with plus or minus 20 basis points of China's 88.5 CDS spread. From there, we can look at the average debt/GDP of the peer group, and multiply it by China's GDP, to find the implied amount of debt/GDP in China. Chart 5 below summarizes these findings.



*Chart 5, Source: Bloomberg 5-Year CDS Spreads, Debt/GDP

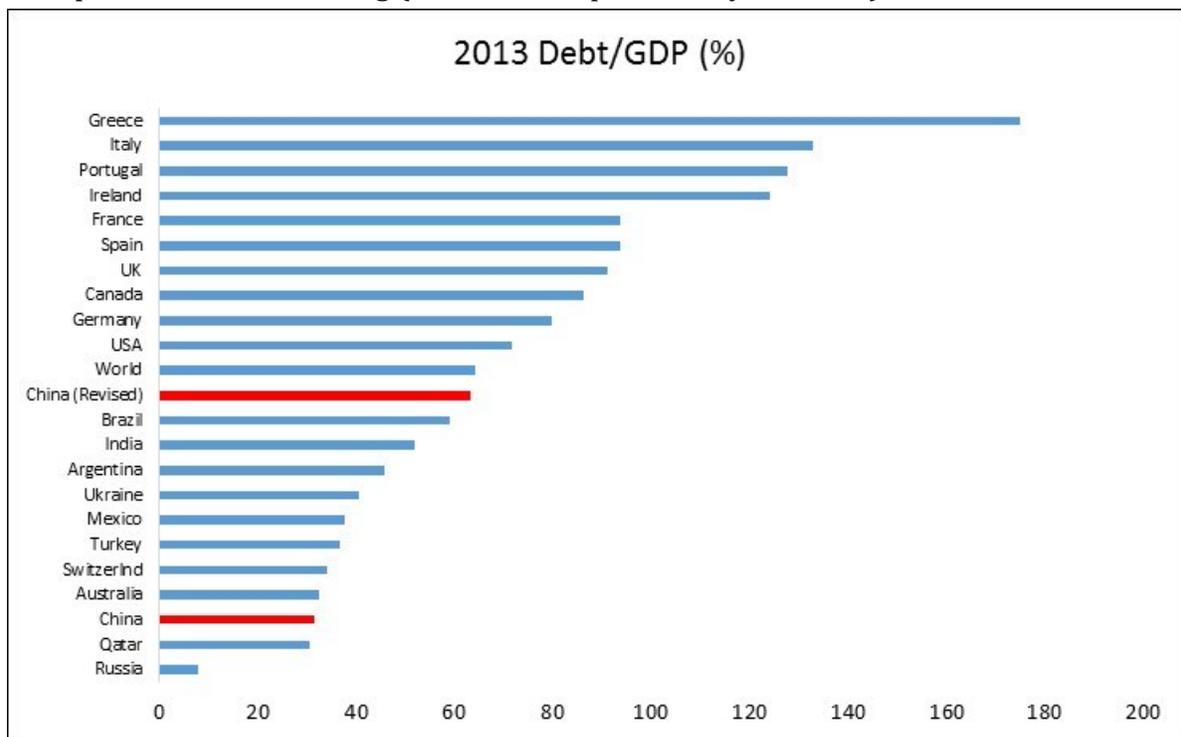
As shown in the graph, four countries, Slovakia, Poland, Mexico, and Israel, have higher Debt/GDP ratios and CDS spreads lower than China. This roughly implies that China's Debt/GDP may actually be higher than reported. Interestingly enough, the average CDS spread of the peer group is very close to China's, standing at 86.85 basis points, as compared to China's 88.50, obtained from Bloomberg. The average Debt/GDP for these countries is 53.5%, however, as opposed to China's

31.7%. If we use this estimate of Debt/GDP to calculate China's debt, we posit China's debt stands at 30.64 trillion RMB (56.9 trillion * 53.5%). While this is slightly less than 35.99 trillion calculated above, it is within range, further supporting my estimate.

An alternative interpretation to these numbers is one of political risk in each of these countries. According to Hatchondo and Martinez, repayment decisions of debt are determined by public officials and may be affected by various issues such as proximity of elections, conflicts within governments, and institutional breakdowns or citizen backlash (Hatchondo and Martinez, 2010). Looking at Chart 5, we see that while Israel and Slovakia have higher debt/GDP ratios than China, their CDS spreads are within 20 basis points of China. So while we could interpret this as an underestimation of Chinese debt, one could also look at these numbers as higher political risk in Slovakia and Israel. Interestingly enough, when the above CDS spreads were pulled in early April, Slovakia had just elected a new president (Salzmann, 2014). Furthermore, political instability in Israel has been long documented through its tensions with Palestine. All in all, there are many shortcomings with finding a single variable from CDS spreads. With that in mind, I acknowledge the potential problems with extrapolating a single variable from CDS spreads, even though it is used as a "back of the envelope" calculation to find China's debt. Further studies on China's debt levels would need to take in many variables if CDS were used as the only measure of finding Chinese debt, which is why I will use my estimate from the research I conducted in the implications section of this paper, instead of the number found in the CDS calculation.

IMPLICATIONS

The revised amount of debt in China opens a discussion that might otherwise not take place if China's reported debt levels are taken at face value. At 31.7% Debt/GDP ratio, China looks very safe, especially compared with other major economies that have much higher levels of debt to GDP than China. When the number is updated to reflect our revised amount of debt, however, China's prospects don't look as strong. Chart 6 shows 2013 Debt/GDP for selected countries, pulled from Bloomberg (with the exception of my estimate).



**Chart 6, Source: Bloomberg*

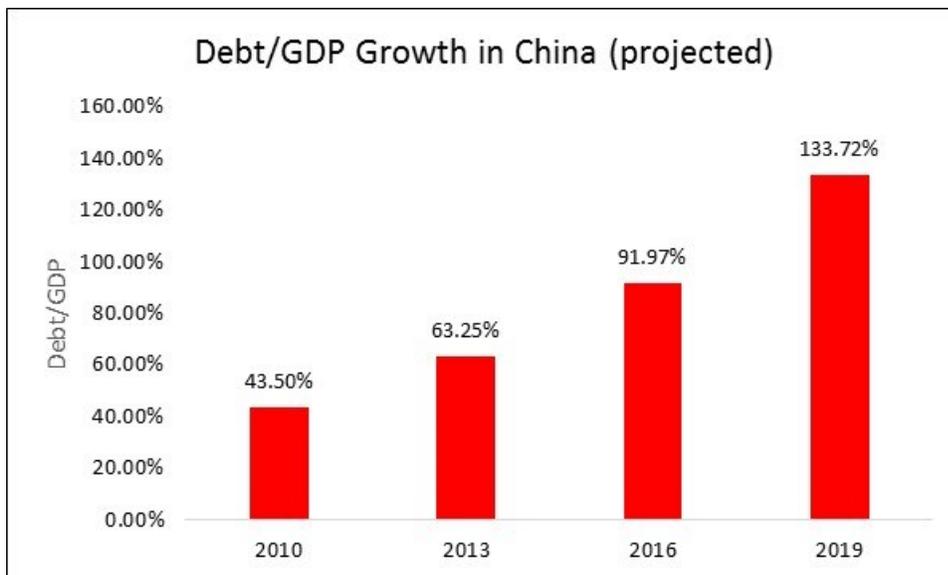
While interesting, the chart above doesn't present a perfect picture of China's new placement within the world's debt/GDP rankings, as almost all countries have a certain amount of contingent liabilities, and I have only added China's back in. These liabilities are prevalent enough for Standard and Poor's to estimate contingent liabilities of each country to incorporate in its bond ratings (Standard & Poor's,

2013), which strengthens the argument that almost all countries have some form of off-balance sheet liabilities. As mentioned earlier, however, Kharas and Mishra's research in 2001 states developing economies tend to have more off-balance sheet liabilities than developed economies, suggesting China may have more of these liabilities than other countries presented in the table. In addition to this, Rutowski stated that China's *reported* debt from local governments was already larger than the central government debt in 2012, as compared to countries such as Japan, Brazil, India, Turkey, United State, Korea, Spain, and Mexico which had central government debts drastically larger than subnational government debts (Rutowski, 2013). As we have shown throughout this paper, many of these local debts in China are not reported, which would make the discrepancy of local to central government debt even greater. These factors lead to the conclusion that China's off balance sheet debts would affect its debt/GDP to a larger degree than other countries listed in Chart 6, which makes the comparison of China's revised debt to other countries unrevised debt slightly fairer.

Even with this revised level of debt/GDP, it is important to ask the question: what level of debt/GDP is unsafe, if there is such an amount? According to Reinhart and Rogoff, when gross external debt reaches 60% of GDP, a country's annual growth declines by two percent, and for levels of debt in excess of 90 percent, GDP growth is roughly cut in half (Reinhart and Rogoff, 2010). Despite this claim, a recent paper in the Cambridge Journal of Economics refutes Reinhart and Rogoff's findings through errors in their calculations. Ultimately the conclusion of this paper, which was later acknowledged by Reinhart and Rogoff, is that there is no clear

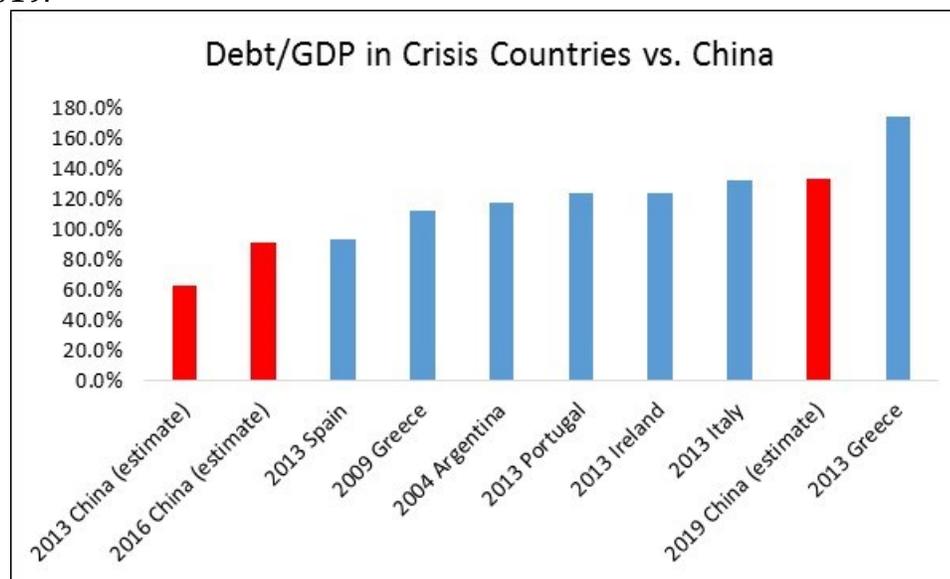
public debt threshold beyond which GDP growth will fall off sharply (Herndon, Ash, Pollin, 2013).

While there might not be a specific level of debt/GDP that indicates a full blown crisis, evidence from countries that have either defaulted on its debt, or are ranked in the top five of one-year default probability according to the one-year default probability model on Bloomberg, shows all these countries exhibit debt/GDP ratios above 90%. While China is not currently at this threshold, applying a growth rate from 2010 debt/GDP, to my estimated 2013 debt/GDP levels presented in this paper, shows debt/GDP growing at 45.4% every three years. If this level progressed, China would be above 90% debt/GDP in 2016, and be over 130% debt/GDP in 2019, a frightening path for a country that has already seen slowing GDP growth. Chart 7 shows these findings below.



*Chart 7, Source: Bloomberg and my estimates

In the past decade, two major countries have defaulted on their debt liabilities – Argentina in 2005 and Greece in 2010. While the factors surrounding both of these defaults were complex and different in each case, one constant factor between the two was crippling amounts of debt compared to the countries' GDP. While these crises came to fruition, there are also countries today that analysts monitor as potential default candidates. Bloomberg, through its "Crisis Monitor", uses a model to predict the highest probabilities of one year default among countries in the world. Currently, the five highest probabilities of sovereign default due to balance sheet issues (as opposed to political or governmental issues, like Ukraine) all come out of Europe. Four of the five countries have debt/GDP levels over 124%, and Spain, who is the 5th highest, has a level of 93.7%. Chart 8 below shows debt to GDP levels of Greece and Argentina the year before they defaulted and the debt to GDP of the five countries with the highest current probability of default compared to China's revised estimates of debt to GDP in 2013, 2016 and 2019.



*Chart 8, Source: Bloomberg and my estimates

China's debt situation is not currently a problem, but certainly has the potential to become one. If China's debt/GDP continues to grow at its alarming pace, its 2019 debt/GDP will be well above many countries that appear to be in crisis at the moment. Like many other estimates presented in this paper, there are certain shortfalls to make a perfect comparison to these countries. For starters, we have already mentioned that by adding in China's off balance sheet liabilities and not repeating this process for other countries, China's debt/GDP will be the only one skewed high. We have also discussed that debt/GDP alone is not the only factor that determines growth in a country, and furthermore, there is no specific level of debt/GDP that indicates a country is about to falter. Despite these shortcomings, it is still interesting to compare these theoretical levels of debt in China to other countries in crisis. While in no way is the chart above an indication of imminent doom in China, it does highlight the potential for the country to reach levels of debt that are consistent with countries that have struggled with sovereign debt either in the past, or in present day.

The far reaching effects of a Chinese debt crisis would be felt throughout the world. The implications of understanding broad level risks in China are important to active participants in foreign markets, such as multinational companies, institutional investors, and individual investors, among others. China has shown its tremendous potential for growth, and will hopefully continue to make strides as it becomes arguably the world's most important economy. For it to get there, however, it will need to grasp the importance of transparency and risk to safely finance growth.

For transparency to become prevalent in local China, a good next step would be for the development of a local bond market, instead of a murky view created through LGFVs. According to Ma, during recent years, the debate as to whether or not China should allow local governments to issue bonds in the debt market has begun. The most important advantage of doing this is to create transparency for local governments' debts. Despite this, the central government has been hesitant to institute this policy. Still, the need to make local governments accountable for the repayment of their debts is paramount, and the central government has begun to consider allowing local governments to issue their own bonds. Because of this, the term local bonds appeared in China's official documents for the first time in 2009. While these bonds are not true local bonds, because local governments are unable to directly transact with investors in the debt market, it creates a pseudo-local bond (Ma, 2013). The expansion of this market would help investors create a clearer picture of Chinese debt, but also help the central government in China implement controls on the level of debt for each locality. If local borrowing was more transparent, the central government could hold subnational government's accountable for excessive spending and borrowing.

There also needs to be a heightened emphasis on China not falling into the trap of re-borrowing to finance companies that are sure to fail, and adding more debt to its balance sheet. While ratings from credit agencies in China have rated LGFV bonds favorably in the past, and these vehicles have used debt to finance interest payments, default on certain bonds could potentially signal a strengthening of lending standards, which would be better in the long term.

On March 6, 2014, Chinese markets experienced a default for the first time on a LGFV bond. Shanghai Chaori, a solar-panel equipment maker, defaulted on 89.9 million RMB worth of interest payments (Wei, 2014). While this is a very small default, and is unlikely to have much of an effect of market sentiment, it potentially represents a step in the right direction for the Chinese government, whom will not continually bail out LGFVs in the case of default.

CONCLUSION

China's economic history of financial prudence, especially related to debt, seems like a distant memory compared to its current situation. The 2008 global financial crisis led the Chinese government to enact the largest stimulus program in the nation's history, which opened the door for local governments to borrow in a variety of ways.

China's debt to GDP level appears to be manageable, and even enviable at its reported level, but digging deeper into off balance sheet liabilities allows one to take a clearer look at the risks factors in China. Public pensions and universities, as well as local government financing vehicles debt may not show up on China's balance sheet, but would certainly need to be paid for in the case of default. China's estimates of local debt that are lower than nearly every other estimate available highlight a serious problem in the credibility of the government's reporting methods, and makes one wonder if the government will ever take accountability for the true amount of liabilities in the country.

Using estimates from economists, analysts, and investors helps us come to a more complete picture of debt in China. From my analysis, China's true debt level at

the end of 2013 is 35.99 trillion RMB, or 63.25% of debt/GDP, which is in stark contrast to the reported 31.7% debt/GDP. While the revised level of debt is concerning, it is yet to reach a “crisis” level that some countries find themselves in. With that being said, if China’s government debt continues to grow at its current pace, especially in light of slowing GDP growth, a sovereign debt crisis could be a possibility in the near future, as debt/GDP is projected to be above 130% in 2019, which is a higher level than Argentina in 2005 and Greece in 2009, both of which defaulted on their debt.

While one can look at the above outlook in a pessimistic light, there have been recent signs from China that indicate the government is trying to take a step in the right direction to increase transparency into local government finances by starting, even on a small scale, a local government bond market. Furthermore, the first LGFV bond defaulted in China within the past two months. Although this could be seen as a sign of weakness, I tend to view it the opposite way, as China is letting markets and economics, and not rolling over debt, play its role in deciding the fate of LGFV bonds. Despite China’s size as the world’s second largest economy, there are still steps that can improve the clarity, trust, and transparency in their marketplace. Hopefully, for China and the rest of the world’s sake, China will figure out and address these problems before they come full circle.

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