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Guonan Ma and Wang Yao

Can the Chinese bond market facilitate a globalizing renminbi?



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Can the Chinese bond market facilitate a globalizing renminbi?

Abstract

A global renminbi needs to be backed by a large, deep and liquid renminbi bond market with a world-class Chinese government bond (CGB) market as its core. China's CGB market is the seventh largest in the world while sitting alongside a huge but non-tradable and captive central bank liability in the form of required reserves. By transforming the non-tradable central bank liabilities into homogeneous and tradable CGBs through halving the high Chinese reserve requirements, the size of the CGB market can easily double. This would help overcome some market impediments and elevate the CGBs to a top three government bond market globally, boosting market liquidity while trimming distortions to the banking system. With a foreign ownership similar to that of the JGBs, CGBs held by foreign investors may increase ten-fold by 2020, approaching 5 percent of the 2014 global foreign reserves and facilitating a potential global renminbi, especially in the wake of the renminbi's inclusion into the basket of the IMF Special Drawing Rights.

Keywords: bond market, government bond market, renminbi internationalization.

JEL code: F02, E42, E44, E58, G10, H63.

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1 Introduction

This paper explores the prospect for the Chinese bond market as a potential global renminbi (RMB) asset class in the context of the RMB internationalization. A global RMB needs to be underpinned by broad, sizable and deep financial markets. Currency markets on their own are the largest financial markets, but currency trades typically involve bond purchases and sales. Thus what we mean by a liquid and actively traded currency is primarily one backed by a big and liquid bond market.

While municipal bonds, corporate bonds, and the stock market are also significant aspects of market liquidity, often the core is first and foremost the treasury and policy bond markets. However, there are real challenges to the Chinese bond development, including the underweight of market size relative to economic scale, regulatory fragmentation, moral hazard, a less active investor base and still low foreign ownership.

But bold policy initiatives can help overcome some of these challenges and double the market size of the Chinese government bonds (CGBs) or treasuries in short order by consolidating fragmented public-sector liabilities at the central government level. This would bring the CGB market to the top third treasury market globally. By 2020, a combination of a bigger market and higher foreign ownership can potentially increase foreign holdings of CGBs outstanding by ten-fold over 2014, reaching RMB2.3 trillion (USD400 billion) and rivaling the Netherlands' entire treasury bond market in 2014, and easily twice as big as the expected size of the global offshore RMB-denominated bonds in 2020.

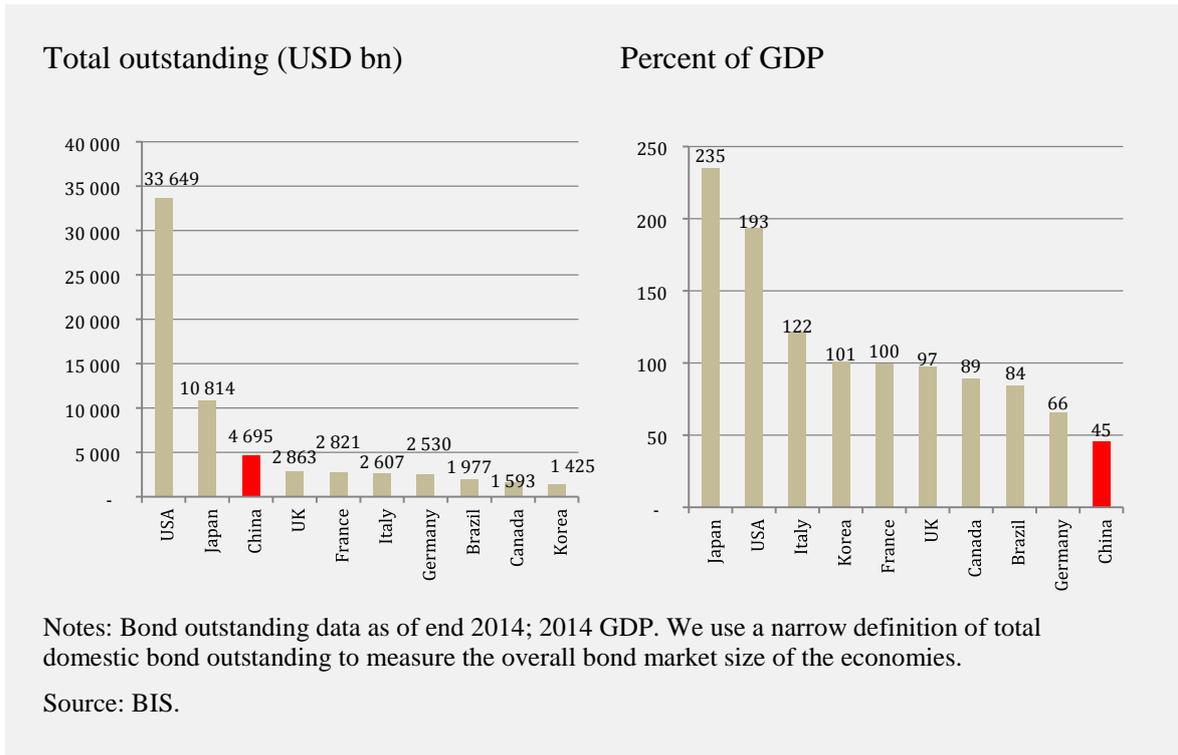
The rest of the paper is organized as follows. Section 2 offers an overview of the Chinese domestic bond market, highlighting its issuer and investor profiles and its scale relative to international peers. Section 3 focuses on the CGB market and its global ranking. Section 4 discusses the possibility of a public-sector debt consolidation scheme that could overnight double the size of the CGB market. Section 5 examines the policy bank bond market, while Section 6 briefly concludes.

2 Overview of the Chinese bond market

IMF officially announced the inclusion of the Chinese RMB into the basket of the Special Drawing Right (SDR), to be effective in October of 2016. This is mostly symbolic in terms of short-term market impact and the current global monetary system status but potentially can be a far-reaching milestone in the journey of the RMB acquiring a status of global currency and in the emergence of a possible new global monetary regime (Overholt, Ma and Law (2016)). However, if the RMB is to acquire the status of a truly global currency, say one of the top five currencies, it has to be backed by ample, liquid and high-quality RMB assets.

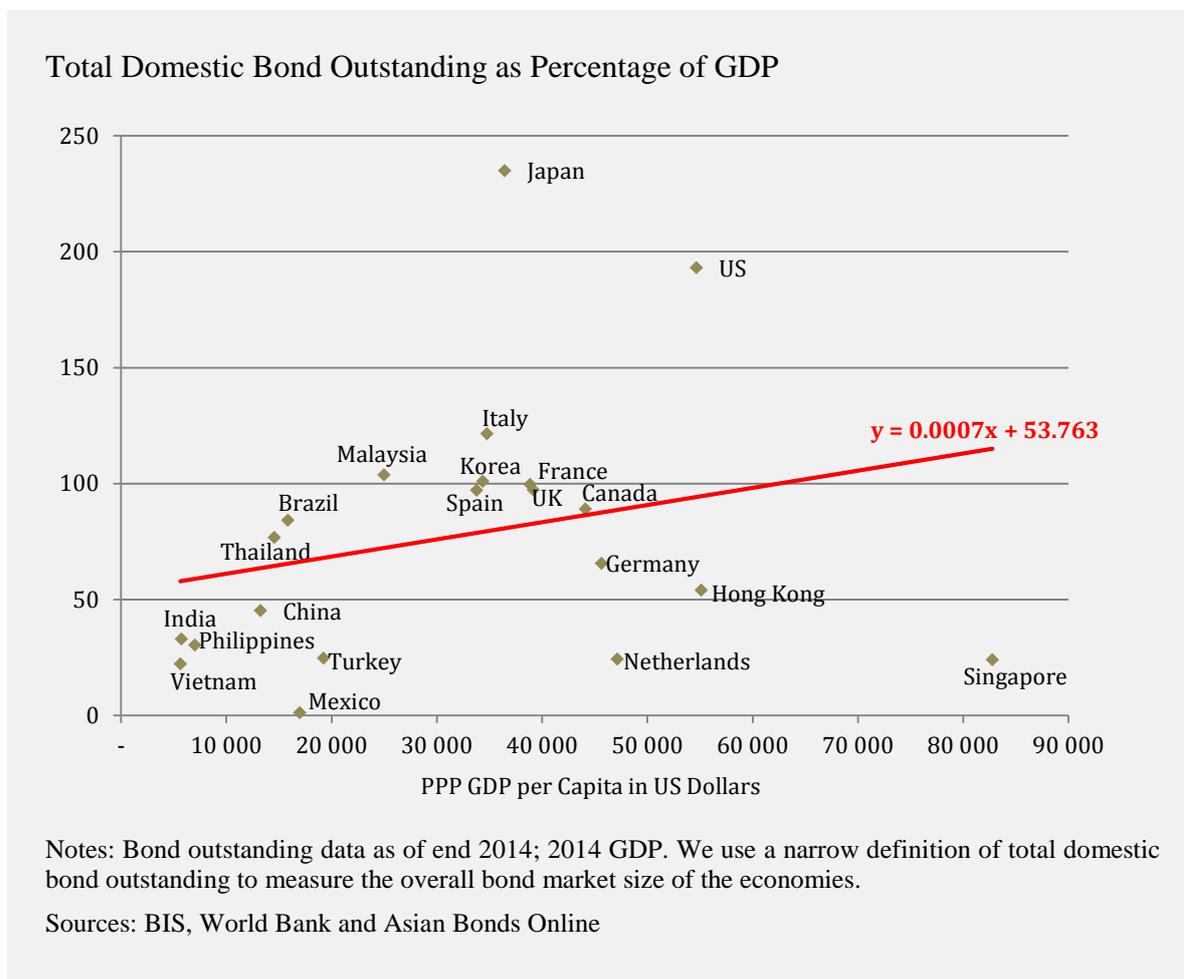
Hence capital market development, especially for fixed-income securities, is crucial. For domestic bond markets, China currently is the third largest bond market globally, less than 15 percent of the size of the U.S. and less than half the size of Japan, according to the BIS statistics (Figure 1). When considered in relation to GDP, China's domestic bonds outstanding is the lowest among the top ten domestic bond markets in the world.

Figure 1 Top ten bond markets in the world, 2014



This raises the question of whether China's bond market punches under its economic weight. In an international comparison of the relationship between per capita PPP GDP and domestic bond outstanding relative to GDP, Eichengreen (2015) shows that the Chinese bond market punches about its weight, meaning the scale of China's domestic bond market is about right in light of its level of economic development. Such a conclusion, while reasonable, may be sensitive to specific data sources and particular sample selections. Using a different dataset from the BIS on bond markets and a bigger sample of both major developed and emerging markets, we obtain a slightly different picture that China's overall bond market remains a somewhat underweight compared to its international peers (Figure 2). Therefore, while debatable, we tend to take the view that China's credit market has been dominated by its banking system, and its bond market has punched under its economic weight.

Figure 2 Bond markets and PPP GDP per capita, 2014



Nevertheless, China's overall leverage of government, non-financial corporations, and households combined has already approached 250 percent of GDP, high by international standards. As discussed, this disparity mainly reflects the fact that China's financial system is still dominated by a huge banking sector, while its debt securities market remains a relatively small segment of the domestic credit market (Table 1). Of the total domestic financing in 2013, bank loans represented more than 60 percent, while the debt securities and equity shares each captured less than 20 percent, in sharp contrast to the situation in most other Asian economies (Table 1).

From this perspective, China probably will not continue leveraging up much further, and a much larger fixed-income sector will have to be achieved and accompanied by considerable but incremental financial disintermediation in the coming decade; that is, the relative share of bank loans in China's total domestic financing will have to decline while that of bond markets will grow. We expect that this prospective disintermediation process will take place as a result of these four potential drivers:

- First, the new Basel III, soon to be more fully embraced by the Chinese banking regulator, and rising bad debts will impose more stringent capital requirements on Chinese commercial banks, thereby restraining their balance sheet expansion. Thus, over the period 2015–2020, China’s debt securities market growth is likely to exceed the pace of expansion in bank lending.
- Second, vigorous policy measures to restrain bank and shadow bank lending to local government financing vehicles (LGFVs) should lead to a big jump in issuance of municipal government bonds to replace some of the maturing bank and shadow bank loans to these LGFVs. China’s new Budget Law formally legalizes bond issuance by local governments, while the State Council has issued detailed management rules over municipal bond issuance, including the new scheme to swapping local government borrowings from banks and shadow banks for tradable municipal bonds.
- Third, the Chinese regulatory frameworks may have improved sufficiently to spur a sizable pickup in the asset-backed securitization market, enabling banks to sell their loans to investors in the form of bonds. Having offloaded the risk to bond investors, banks can take on new risk to make more loans. Asset-backed securities have risen eight-fold over the past two years, which probably is only the beginning of this process.
- Fourth, financial deregulation may force commercial banks to turn more of their attention to the small and medium size enterprises (SMEs) in order to maintain their net interest margins, so blue chip companies will likely make more use of the debt securities market. As the investment-grade segment expands, the high-yield segments may pick up in due course as well, though the lag could be considerable.

In sum, a deeper and more liquid bond market would offer a viable alternative to bank loans, a “spare tire” in the search for finance (Greenspan, 1999), thereby enhancing financial stability through the facilitation of a more diversified credit market. While instability can originate from either or both banking and bond segments of the financial system, no spare tire is inferior because of the reduced choice set and market competition. By 2020, we expect China’s domestic financing profile to change, reflecting bigger roles for both the debt and equity capital markets and a diminished role for the banking sector. Depending on the pace of financial liberalization and based on the recent Japanese experience, we anticipate that the bank loan share of the domestic financing is likely to shrink from 63 percent in 2013 to 55 percent by 2020, while the shares of bond and equity securities financing should increase from 18 percent, respectively, to 22 percent each (Table 1).

Table 1 Composition of domestic financing

Percent of the total domestic financing, December 2013

	CN	HK	ID	JP	KR	MY	PH	SG	TH*
Credit	63.3	14.9	39.1	47.5	36.2	34.2	28.5	22.0	34.5
Bonds	18.7	5.0	12.6	40.4	36.6	27.1	21.6	18.1	25.2
Equity	18.1	80.0	48.4	12.1	27.2	38.7	49.9	59.9	40.3

Notes: CN=China; HK=Hong Kong; ID=India; JP=Japan; KR=Korea; MY=Malaysia; PH=Philippines; SG=Singapore; TH=Thailand. * Korea and Thailand as of Q3 2014, China as of June 2013.

Source: Asian Bonds Online. <http://asianbondsonline.adb.org/regional/data.php>.

While the Chinese domestic bond market has experienced a seven-fold expansion over the past decade, Tables 2 and 3 also reveal four striking institutional features in recent years (ASIFMA, 2013).

First is the overwhelming dominance of domestic banks in the Chinese bond market, both as issuers and as investors (Huang and Zhu, 2007). Banks are also the biggest bond underwriters outside the treasury segment of the primary market, which is not yet open to foreign underwriters.

Second, most bond *issuers* are government-linked, naturally giving rise to moral hazard risks. The treasuries (CGBs) issued by the Ministry of Finance (MoF), PBOC bills, policy bank bonds, municipals, and government-supported bonds together have accounted for more than 70 percent of total bonds outstanding (Standard and Poor's, 2009). In addition, most of the remaining segments such as corporate bonds and commercial bank bonds are SOE and LGFV issues. The Chinese domestic bond market only witnessed its first few defaults of SOE issuers in 2015, suggesting still significant moral hazard risk. Finally, such government-linked bonds are divided into various segments with different regulators and obligors, thus splitting liquidity and depressing market depth. Currently, none of them can become meaningful global asset classes on their own. When a given liquidity pool is divided into two equal market segments, the liquidity of each can decline by 80 percent or more, for instance.

Third, among bond *investors*, commercial banks and special institutions (mostly the PBOC, MoF and policy banks) combine to hold 70 percent of the total onshore bonds outstanding (Table 3). The share held by all other non-bank financials, including insurance, pensions and bond funds, which tend to trade more actively (Mu, 2006), was 23 percent in 2014. That compares with two-thirds of U.K. gilts held by insurance companies and pension funds. Such a lopsided investor base is unlikely to nurture bond market liquidity but also hints at the way forward.

Foreign holdings of onshore RMB bonds amount to RMB672 billion as of 2014, only 2.3 percent of the total domestic local currency bonds outstanding because of China's binding capital control (Ma and McCauley, 2008) and far below the shares seen in other Asian markets (Table 6), but easily matching or even exceeding the entire stock of the 'Dimsum bonds' globally – bonds denominated in RMB but issued offshore.

Table 2 Chinese domestic bond market, by issuer

RMB bn, year-end

	2010	Percent of total	2014	Percent of total	2014–20 CAGR percent	2020 ^e
Treasury (CGB)	5,963	29.6	8,553	29.8	10	15,152
PBOC bills	4,091	20.3	428	1.5	n.a.	0
Municipals	400	2.0	1,162	4.0	50	13,236
Financials	5,827	28.9	11,256	39.2	8	17,862
– Policy Banks	5,160	25.6	9,957	34.7	12	19,653
– CDB Bonds	3,680	18.2	6,266	21.8	12	12,368
Gov-supported	109	0.5	1,103	3.8	10	1,954
Non-financials	2,810	13.9	5,005	17.4	8	7,942
Asset-backed	18	0.0	269	0.9	35	1,628
Others	975	4.8	954	3.3	8	1,514
Total	20,175	100	28,730	100	13	59,289

Notes: "n.a." stands for not applicable. Saving Bonds (electronic) issued by Ministry of Finance are not included as CGBs here, but in the category of Others, as Saving Bonds are different from the Book-entry Treasury Bonds in that they are much smaller in scale, not liquid, and only for retail investors. CDB= China Development Bank.

Sources: ChinaBond.com and CEIC.

Fourth, the Chinese domestic bond market remains fragmented in terms of its regulatory framework across both instruments and trading platforms. China still has multiple regulators (the MoF, PBOC, CSRC, CBRC and NDRC) supervising various debt instruments traded mostly on the two different markets of the stock exchanges and the interbank bond trading platform. For instance, the CGB benchmark yield curve is divided with the tenor under one year under de facto PBOC supervision and the rest under de facto MoF supervision. Most would agree that such a fragmentation hurts Chinese bond market development, not only

dividing market liquidity, but also resulting in regulatory arbitrage, inefficiency and higher financing costs (Bai, Fleming and Horan, 2013).

Table 3 Chinese bond market, by investor

RMB bn, year-end

	2010	Percent of total	2013	Percent of total	2014	Percent of total
Commercial banks	14,087	69.8	16,682	64.4	18,101	63.0
Special Institutions	1,753	8.7	1,701	6.6	1,710	6.0
Non-bank financials	3,820	18.9	5,827	22.5	6,460	22.5
Non-financials	44	0.2	15	0.1	12	0
Overseas	n.a.	n.a.	400	1.5	672	2.3
– CGB*	n.a.	n.a.	136	1.7	222	2.6
– CDB*	n.a.	n.a.	44	0.8	92	1.5
Others	471	2.3	1,286	5.0	1,774	6.2
Total	20,175	100	25,911	100	28,729	100

Notes: “n.a.” stands for not applicable. Municipals and others are not included due to limited data availability. Special Institutions include the PBOC, Ministry of Finance, policy banks, etc. (特殊结算成员：包括人民银行、财政部、政策性银行等机构). *The share of overseas holding for CGB (CDB) is calculated as the amount of overseas holding of CGB (CDB) divided by the onshore CGB (CDB) outstanding.

Sources: China Central Depository & Clearing Co., Ltd and PBOC.

The next five years may witness the emergence of three broad new forces that will particularly help shape the prospects of the Chinese domestic bond market in 2020.

First is the expected incremental disintermediation process discussed above, which supports the debt securities market, particularly the municipal and securitization segments. The 2015 swap scheme of issuing RMB3.2 trillion official standardized municipals to replace opaque third-party LGFV borrowing often from banks and shadow banking is an example.

Second, ongoing financial liberalization and market development may also help bring about a more efficient yield curve and broaden the derivatives market. Most interest rates are essentially liberalized. A full CGB benchmark yield curve was officially announced for the first time in November 2014. The latest re-launch of Chinese treasury futures is also a case in point (McCauley and Ma, 2015). We also expect the Chinese bond investor base to diversify further, with a bigger weight for pension funds, insurance companies and bond

funds. Furthermore, steady capital account opening could substantially increase foreign participation in the Chinese domestic bond market. In May 2015, 32 QFIIs, many of them global heavy-weight players, were allowed to enter the Chinese interbank bond market, which may double the foreign holders of onshore RMB bonds in months. A more diversified investor base tends to trade more, thereby deepening market liquidity.

Third, a more consolidated regulatory regime and other complementary policy measures may also prove to be boons to the bond market. In particular, a stronger and more transparent budgetary and debt management framework may spur a significant rise in the issuance of municipal bonds. In addition, a long overdue integration of regulations across rival government agencies may take place in the coming years. Finally, more fixed-income derivative instruments could be launched.

Table 2 summarizes our baseline case of the prospects for the main Chinese bond market components over the course of 2015–2020. We expect the Chinese domestic bond market to expand 13 percent per annum, faster than our baseline nominal GDP growth of 10 percent and bank loan growth of 8 percent. This is a reflection of capital market deepening and an enhanced role of direct financing in the Chinese economy and mostly driven by continued CGB market growth, fast expansion of policy bank bond issuance, and big jumps in municipal bonds and asset-backed securities.

During 2015–2020, we also expect the CGB market to grow organically in line with our baseline nominal GDP, similar to the pace witnessed in recent years. The policy bank bonds may expand at an average pace of 12 percent per annum, to fund affordable housing and shanty town redevelopment projects which are a top government priority. We also envision explosive increases in the market segments for municipal bonds and asset-backed securities, both likely growing at strong paces of 50 percent per annum and 35 percent per annum respectively over 2015–2020, for a number of good reasons.

First, the new Budget Law for the first time officially endorses local government bond issuance, as discussed earlier. Second, the central government policy encourages swaps of municipal bonds for the large overhang of maturing LGFV borrowing, which are often from shadow banking and tend to be shorter-term and higher interest rates. Third, a financing gap continues arising from the need to provide services to rural migrants at local levels in the ongoing urbanization process. Fourth, more supportive policy and regulations have been in place to promote securitization, in an attempt to ease pressure on bank capital.

However, we expect PBOC bills to be mostly phased out by 2020, due to a changing monetary policy framework, a departure from sustained currency interventions, and waning net capital inflows or even large capital outflows. Also, non-financial corporate bond segment may grow at a relatively slow pace, despite the latest big jumps in the issuance by Chinese property developers, in part because a big chunk of this segment had been LGFVs issuance that will be swapped and curtailed going forward. Nevertheless, thanks to reduced

moral hazard risk from implicit government guarantees, this slower corporate bond segment will function more like a genuine credit market, facilitating more efficient pricing of credit spreads (Ma, Remonola and He, 2006). At least four de facto but more obvious corporate bond defaults in 2015, including one central government-linked SOE, suggest the emergence of a healthier but slower corporate bond market in China.

3 The CGB market in international perspective

From the perspective of RMB internationalization, this paper focuses in greater depth on one core segment of the Chinese fixed income market – the Chinese government, or treasury bond, (CGB) – which comprises the central government bonds issued by MoF and traded mainly among institutional investors on both the onshore interbank and exchange markets. There are at least five considerations for concentrating our focus on the CGB market.

First, the central question for Chinese policymakers is not so much whether the Chinese RMB will become more internationalized over time – it will (Cheung, Ma and McCauley, 2011; and Overholt, Ma and Law, 2016). The more relevant question here is whether the RMB can acquire a meaningful global currency status and, if so, when and how. A global currency needs to be underpinned by some global asset classes of its own. The national, federal or central government bond ordinarily constitutes the core of such a potential global asset class. It is hard to imagine the RMB as a global currency while sitting on a miniscule CGB market, even after its latest inclusion into the IMF SDR basket.

Second, market size and liquidity of the government bond markets tend to be positively and highly correlated (McCauley, 2003; and McCauley and Remolona, 2000). Without a big pool of assets, there will be no liquidity to speak of, although market size by itself does not ensure adequate market liquidity. A small and “liquid” CGB market would not lift itself to a meaningful global asset class. Furthermore, a sizable CGB market would exert pressure on the various Chinese regulators and trading platforms to get their respective acts together in order to build a more integrated regulatory framework and domestic bond market. Most importantly, a more unified and liquid bond market also serves the real economy better.

Third, as China opens up more of its capital account, a liquid and deep CGB market will better absorb shocks from potentially volatile cross-border capital flows – and lend confidence to Chinese policymakers in the process (McCauley and Ma, 2015; Ma and McCauley, 2014). It would also encourage Chinese authorities to further liberalize both the primary and secondary CGB markets to domestic and foreign players, creating more diversified investor and market-maker bases and enhancing competition, all of which would boost market liquidity. Moreover, a bigger onshore CGB market could only help the development of offshore Dimsum bond markets, as any remaining cross-border segmentation between the onshore and offshore RMB bond markets would be of less concern if the overall CGB market

itself is sizable enough and exceeds certain critical mass. Segmentation can arise from capital control and differentials in tax and/or prudential rules. In short, a bigger and more liquid Chinese treasury market would facilitate greater RMB convertibility, backing the RMB as a goal of global currency.

Fourth, a better functioning Chinese government bond (CGB) market would provide better benchmarks and hedging vehicles that can support corporate and municipal bond markets (CGFS, 1999a and 1999b). By providing more efficient and reliable benchmarks for the fuller yield curve and credit spreads as well as for pricing fixed-income derivatives, a bigger and homogeneous CGB market would also help reduce borrowing costs for both the Chinese government and other borrowers in the long term; ease the burden on taxpayers; and facilitate the development of the broad Chinese fixed-income market, by providing more efficient benchmarks and trimming financial costs (BIS, 2002).

Fifth and finally, central government debt is typically a top asset class for global fund managers and the first choice for central bank reserve asset managers. Most central banks hold some sovereign issues before moving down the credit spectrum to other fixed-income products. As a benchmark, the foreign ownership of the U.S. equities, corporate bonds and treasuries is 25 percent, 30 percent and 40 percent, respectively. Accordingly, a large and robust CGB market is crucial for the RMB to become a meaningful reserve currency in the long term.

Simply put, size is not everything but it does matter – particularly in the longer term. A sizable CGB market offers a crucial platform for a more diversified investor base, stronger competition, quality trading infrastructure, greater market opening, and better market liquidity, serving as one central pillar supporting a structure in which the RMB functions as a potential global currency.

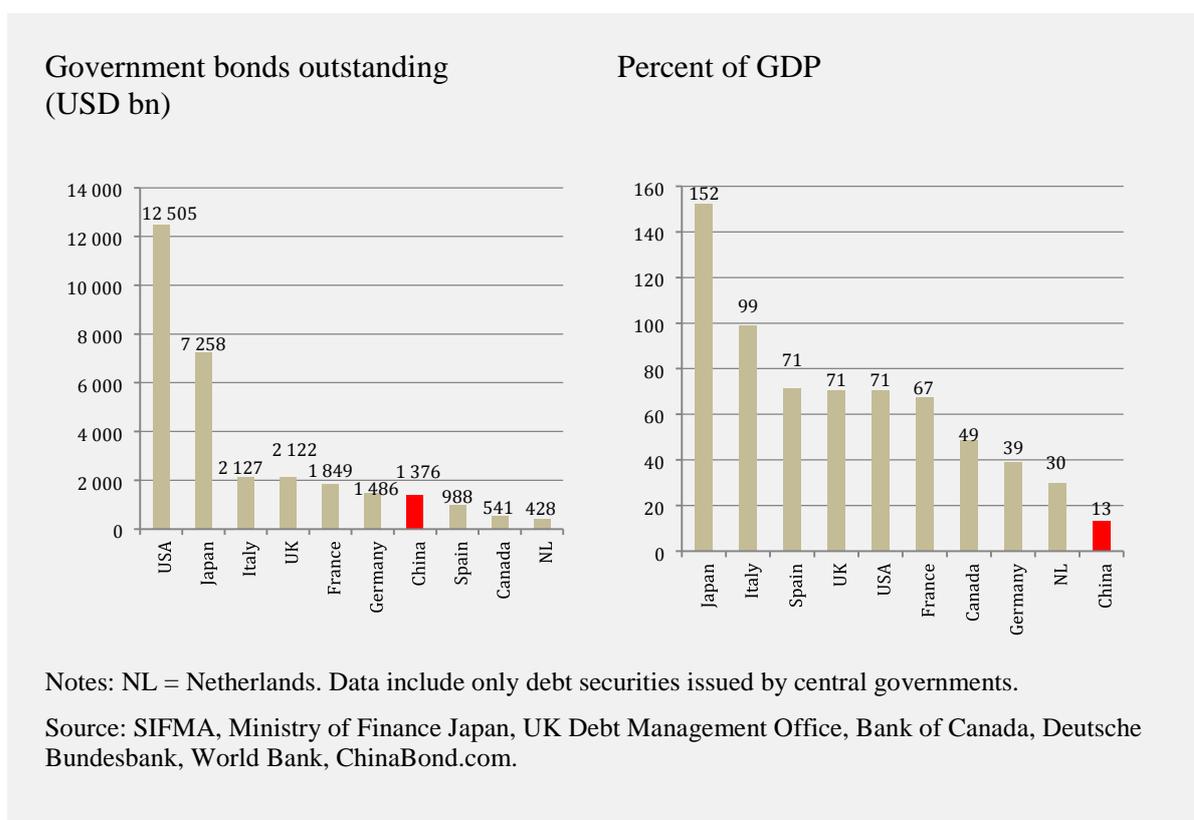
Today, the Chinese treasury market is the seventh largest national government bond market on earth, about one-tenth the size of the U.S. treasury market and just ahead that of Spain, Canada and Netherlands (Figure 3). The Canadian dollar is a highly internationalized currency, but a small one. A highly internationalized “small currency” would not be worth the effort by the Chinese government to actively promote the external use of the RMB – nor worth the commitment of resources on the part of a global commercial bank to pursue RMB business opportunities.

To put the Chinese treasury market in international perspective, we look at the national government bond markets denominated in the existing four member currencies of the SDR as our benchmarks, as the RMB is to become the fifth member currency in 2016. In a baseline scenario, the U.S. Treasury market will remain a class of its own in terms of size, depth, and breadth over the next two decades. On this matrix, the US dollar is unlikely to be challenged as the dominant and top-tier global currency. Accordingly, our comparative study

pays more attention to the markets of the three second-tier global currencies in the SDR: euro sovereigns, Japanese government bonds (JGBs) and U.K. Gilts.

The euro area is the second largest global economy and trader, with a combined market for member government bonds outstanding of some USD8 trillion, which is still below the size of the U.S. Treasury market (USD12 trillion) but comes in ahead of that of the JGB market. Indeed, five out of the top ten government bond markets are euro member states (Figure 3).

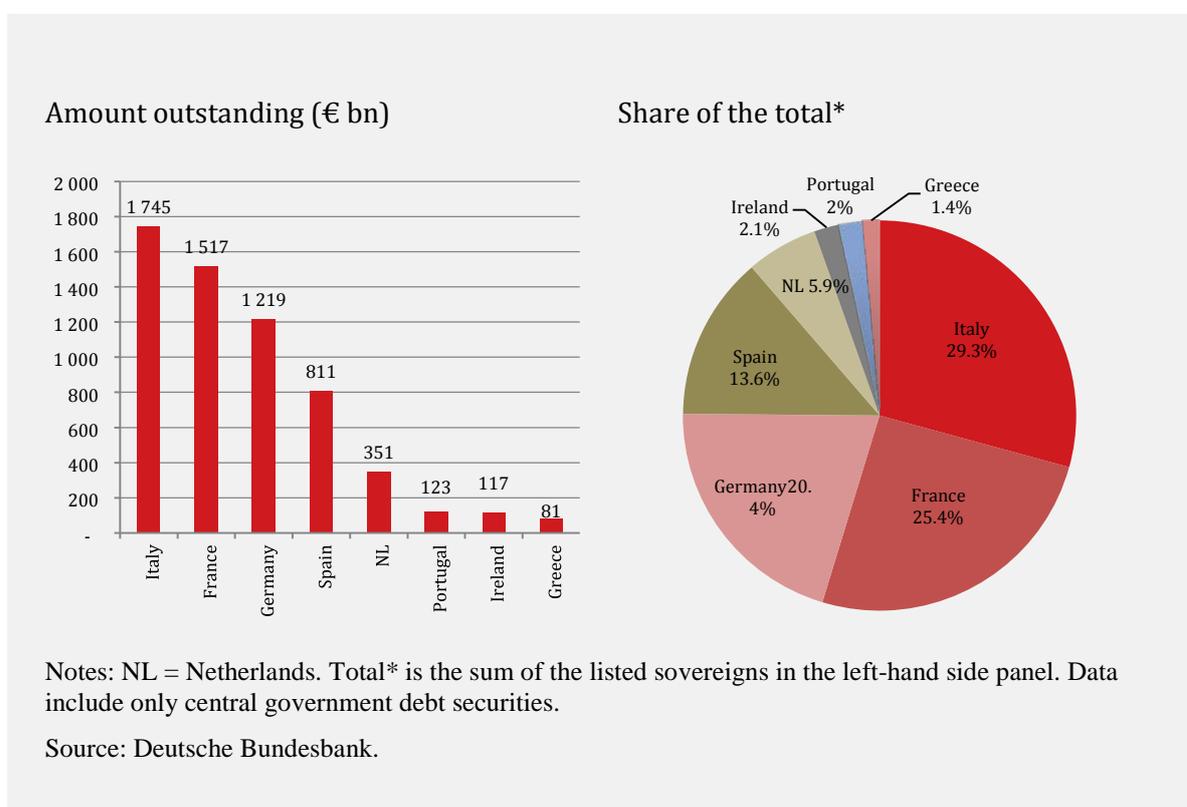
Figure 3 Top ten government bond markets in the world, 2014



Nevertheless, for the foreseeable future, the euro is unlikely to challenge the dominance of the USD, mainly because of the limited fiscal integration backing the monetary union. For one thing, there are few fiscal arrangements that cover the entire euro zone. The “Stability and Growth Pact” has been in effect since 1999; however, the Pact and other rules are not always enforced. Also, fiscal centralization via the European Union budgetary system is limited. It is only these weak measures and the new European Stability Mechanism (ESM) under the governance of euro area finance ministers that bind the 19 diverse euro sovereigns together. In short, the euro sovereign debt market is still fragmented.

Thus, without a deeper and more permanent fiscal union, the huge aggregate euro area government bond market is just a collection of fragmented individual sovereign issues – despite a common central bank. Figure 4 shows the eight major euro sovereign bond markets and their relative shares. Given the substantial differentiation in sovereign credit risks across the euro area, the sovereign bond markets in the euro area look more like a group of municipal bond markets with distinct and variable credit and liquidity premiums, especially in times of stress (Figure 5). The situation may continue into the foreseeable future, given the outlook for a limited political union across the euro area. The ongoing Greek drama highlights this challenge. (The EU lately starts a long-term initiative of capital market union to build a more integrated market for risk capital (Véron and Wolff, 2015)).

Figure 4 Main Euro sovereign bond markets, 2014

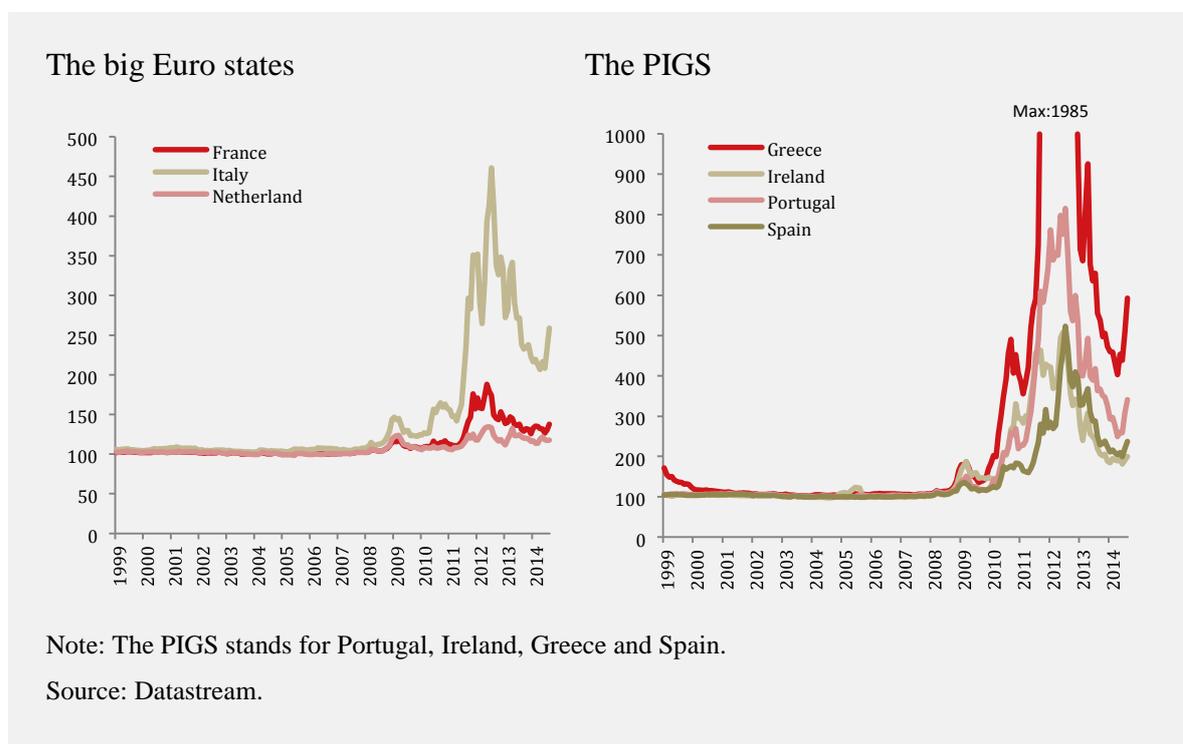


Thus, the national government bond markets in the euro area are far from integrated and, with the exception of the mighty German bund market, their depth and liquidity are questionable. In other words, the euro is underpinned by a collection of disparate sovereign bond markets under the 19 highly independent treasuries across the monetary union, which severely limits the market liquidity required to back a common currency.

The JGB market is the second largest central government bond market on earth, second only to the U.S. treasury market. However, less than one-tenth of total JGBs are held by foreign investors, as domestic private saving has thus far been more than enough to cover

the government's dis-saving. Furthermore, thanks to rounds of qualitative and quantitative easing (QQE), currently about one-fifth of total JGBs outstanding is held by the Bank of Japan (BoJ). The holdings of all government agencies account for approximately one-third of total JGBs outstanding, a circumstance that, if prolonged, may further depress both market-making and trading, and in an extreme case risk market stress. The latest BoJ announcement that it will again greatly expand QQE may further drain liquidity away from the JGB market and, in the process, undermine its credibility.

Figure 5 10-Year sovereign bond yield spreads over the bund (bps)



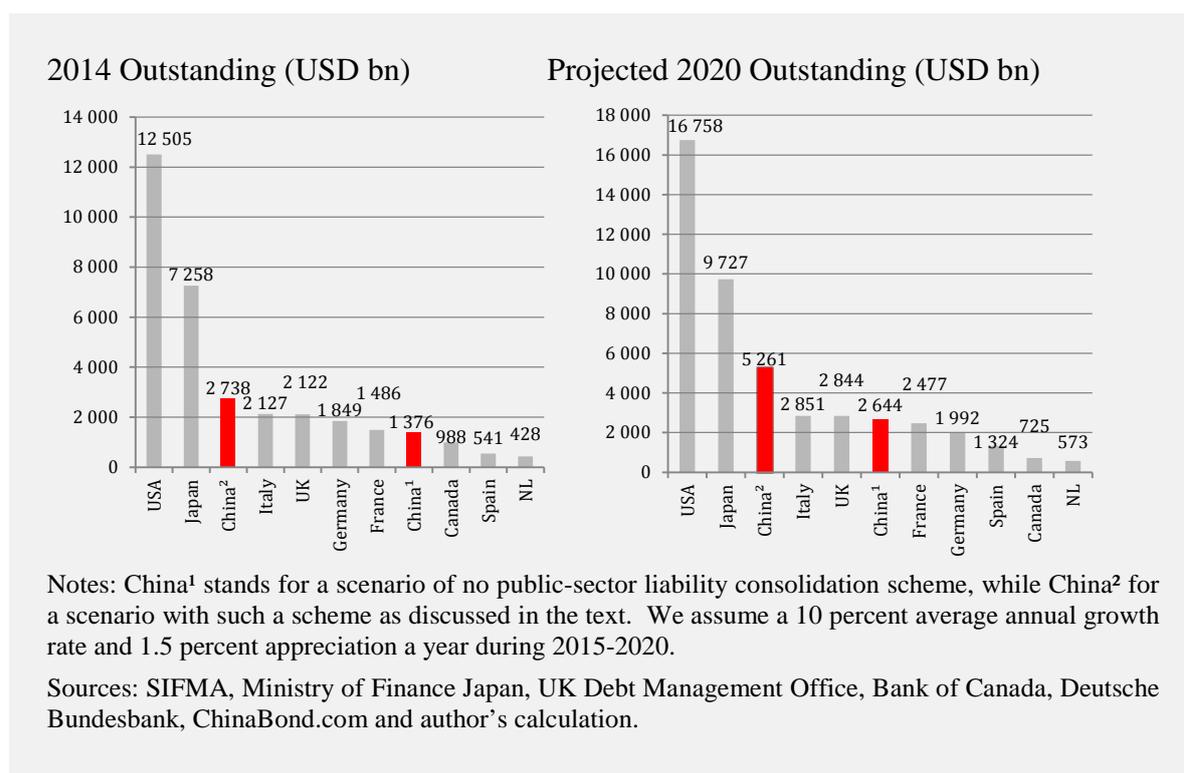
Moreover, if Abeconomics succeeds, interest rates may rise considerably, with worrisome implications for debt service dynamics in light of an extremely high outstanding JGB/GDP ratio. If the Japanese current account surplus continues to shrink or even reverses into deficit, interest costs could rise further, creating troublesome debt dynamics. Consequently, the sizable JGB market may become an even less attractive global asset class for international investors. The footprints of the Japanese government are becoming so large that overseas institutions will increasingly see that market as risky, and may even begin to regard JGBs as less desirable than some emerging market bonds as a major part of their foreign reserves.

Finally, although the U.K. gilt market is highly developed, its size is only one-seventh that of the U.S. treasury market and it may have little room to grow because of the U.K.'s high debt and servicing burdens. Over the longer term, the shadow of the Scottish independence movement may also continue to hang over the U.K. gilt market.

This comparative discussion suggests that over the next decade China needs to force its own various agencies to adopt common national standards. If it succeeds in creating a more unified, larger and more efficient domestic bond market, liquidity in the CGB market will potentially allow itself to match the euro sovereign debt and JGB markets. As a priority, top Chinese leaders should aim to bring various policymaking and regulatory agencies to be one in the next few years.

From the perspective of RMB internationalization, a key question is: can the CGB market reach the threshold of a world-class national government bond market by 2020? A simple illustrative projection of the 2014 top ten government bond markets should provide some useful clues. As a benchmark, we assume that the outstanding national government bonds for the 2014 top ten markets, except China, will all grow at average 5 percent annual rate over the period 2014–2020. This simple projection is aggressive and mostly for purpose of illustration. As discussed, we also assume that CGBs outstanding will grow at a 10 percent a year over the same period.

Figure 6 Top ten government bond markets: 2014 vs 2020



Hence, in our baseline scenario of 10 percent annual growth rate for the CGB market and 1.5 percent annual appreciation for the RMB against the USD, the total of CGBs outstanding in nominal USD terms would double between 2015 and 2020 – but still amount to only about 16 percent of the U.S. treasury market and 27 percent of the JGB market by 2020 (Figure 6). It may approach the size of the U.K. gilt market and slightly exceed the French treasury

market, but, would remain only the fifth largest national government bond market globally. Even by 2030, the Chinese CGB market will be only one fifth the size of the U.S. market under reasonable assumptions. Thus, trend expansion, while permitting the CGB market to make progress, will be insufficient to elevate it to a top global ranking.

Therefore, under reasonable assumptions, the size of the CGB market is unlikely to be a big enough asset class to anchor the RMB as a top-three global currency. On top of this, the CGB market remains fragmented, far less liquid than the U.S. Treasury, JGB, and U.K. Gilt markets and partially restricted to foreign investors (Table 4).

Table 4 Turnover ratio of major government bond markets

Annual turnover over average outstanding

	UST	Gilt	JGB	CGB	CGB incl. futures	China's policy banks	CDB bond	PBOC bills
2004	29.7	9.1	5.4	0.2	0.2	0.9	0.9	1.5
2005	30.2	9.1	5.1	0.4	0.4	1.0	1.0	1.8
2006	26.7	8.5	6.6	0.5	0.5	1.3	1.2	1.7
2007	28.5	8.1	8.8	0.6	0.6	1.2	1.0	2.7
2008	24.4	7.6	8.2	0.8	0.8	2.3	1.6	5.9
2009	14.6	6.0	6.1	0.8	0.8	4.4	3.0	3.2
2010	15.3	5.3	5.1	1.4	1.4	4.6	3.9	4.3
2011	14.3	6.5	5.1	1.4	1.4	3.4	2.9	4.0
2012	11.8	5.2	5.5	1.4	1.4	3.2	2.6	4.8
2013	11.4	n.a.	5.4	0.7	0.8	1.6	1.5	1.1
2014	10.0	n.a.	5.9	0.7	0.8	1.7	1.9	0.3

Notes: "n.a." stands for not applicable. JGB = Japanese government bonds; Gilt = UK government bonds; UST = U.S. treasury bonds; CGB = Chinese government bonds, CDB = China Development Bank.

Sources: SIFMA, UK DMO, Japan Securities Dealers Association, and ChinaBond.com.

In the hierarchy of large, deep, and liquid sovereign bond markets, U.S. treasuries will remain in a class of their own, with the consequence that the dominance of the USD is unlikely to be challenged for the foreseeable future. In our baseline case, by 2020 the CGB market is expected to gain ground, but will only achieve par with some of the individual core euro sovereign debt and Gilt markets. Therefore, under the business-as-usual assumptions, the CGB market by 2020 will remain smaller than many of other sovereign bond markets denominated in the SDR member currencies (see 'China¹' in Figure 6, left panel). To underpin the RMB as a meaningful global currency by 2020, the less liquid CGB market will probably need to break into the top three national government bond markets globally, such as the alternative indicated by 'China²' in Figure 6. But how?

4 A dilemma and a bold public debt consolidation scheme

Of course, one way to expand the Chinese treasury market would be simply for the MoF to run large current fiscal deficits to fund new spending programs and therefore borrow more. Additional expenditures on pensions, healthcare, and infrastructure are all worthwhile. A slightly elevated budget deficit to 3 percent of GDP is indeed tabled to cushion growth slowdown in 2015. However, borrowing excessively to fund wider government budget deficits, while expanding the CGB market, damages China's fiscal position over the long term, eventually hurts its credit standing, widens risk premiums, crowds out private-sector investment, and even depresses consumer spending.

Can something be done to expand the size of the CGB market meaningfully without running excessive fiscal deficits? Yes, it is possible, in our view, through consolidating various and diverse public-sector liabilities at the central government level into the homogenous and marketable CGBs.

One particular version of this proposed scheme involves the PBOC-MoF liability swaps, in which the MoF would overfund its current financing needs by issuing more CGBs to the public and then deposit the proceeds from this additional CGB issuance at the PBOC. This short-term drain on reserves can be offset by a corresponding reduction in the currently high required reserve ratio (RRR). In essence, this is a liability swap between the PBOC and MoF – a swap of the liquid and tradable MoF liabilities (CGBs) for the captive, non-tradable, and illiquid central bank liabilities (mandatory deposits or required reserves by commercial banks at the PBOC). Table 5 sketches this proposed public debt swap scheme, while McCauley and Ma (2015) present a more analytical discussion of various public sector liability consolidation schemes.

Lower reserve requirements would also mitigate the burden on the Chinese banking sector, help contain shadow banking, and expand the bond market, together contributing to rebalance China's financial structure. We illustrate this option here, because some version of this rebalancing would be so healthy for the Chinese economy that we think China's leaders may find the logic compelling. If they do, it would greatly hasten the emergence of a truly global RMB.

China's RRR has been among the highest in the world, mainly because of the PBOC's need to fund and sterilize its large-scale foreign exchange reserve buildup, which occurred mainly in the first decade of the 2000s (Ma et al 2013). China's FX reserves rose more than 70-fold between 1994 and 2014 to a staggering pot of nearly USD4 trillion. The increase in the required deposits by commercial banks at the PBOC has funded some 85 percent of such a foreign exchange reserve accumulation during 2006–2014. The RRR was hiked from 6 percent in 2000 to a peak of 21 percent in 2011 before dipping back to an

average 18 percent in April 2015. But the current RRR level is still very high by any international standard.

High reserve requirements tax financial intermediation, burden commercial banks, add to financing costs, and encourage shadow banking activities for regulatory arbitrage. Ironically, the implicit tax burden imposed by the reserve requirements on commercial banks may double to 2/3 percent of GDP now in an environment of more liberalized interest rates from below 1/3 percent of GDP during 2004–2010 (McCauley and Ma, 2015). In other words, the distortions from reserve requirements worsen following interest rate deregulation. Thus, financial liberalization and interest rate deregulation ought to be accompanied by a meaningful reduction of the currently excessive reserve requirements. Hence, our proposed scheme of swapping the existing captive PBOC liabilities (required deposits) for new tradable MoF liabilities (CGBs) facilitates both capital market development and financial liberalization.

Table 5 A scheme to consolidate public sector liabilities in China

	People's Bank of China (PBOC)		Ministry of Finance (MoF)		Memo
	Assets	Liabilities	Assets	Liabilities	
Status quo: end 2014	• FX reserves	• RMB 22.7 trillion required reserves • RMB 8.6 trillion deposit by MoF • PBOC bills	Deposit in PBOC	RMB 8.6 trillion MoF bonds	Required reserves funded some 85 percent of FX accumulation 2006–14
Swap scheme		• + RMB 8.5 trillion deposit by MoF • – RMB 8.5 trillion required reserves	+ RMB 8.5 trillion deposit in PBOC	+ New issue of MoF bonds: RMB 8.5 trillion	Policy actions: cutting RRR from 18 to 9 percent, and remain the excessive reserve at 2.5 percent
Results	• FX reserves	• RMB 14.2 trillion required reserves • RMB 17.1 trillion deposit by MoF • PBOC bills	Deposit in PBOC	RMB 17.1 trillion MoF bonds	

Note: there can be a variety of similar schemes (for details, see McCauley and Ma, 2015).

Source: author's calculation.

If the current 18 percent RRR is to be halved to 9 percent, the liquidity thus released is estimated to be almost RMB10 trillion and could easily fund a doubling of the CGBs outstanding, from the RMB8.6 trillion to more than RMB17 trillion (from USD1.4 trillion to USD2.7 trillion). The CGB market thus would overnight become one of the top three sovereign debt markets in the world (Figure 6). By 2020, the CGB market would exceed USD5 trillion, amounting to about one third of the U.S. treasury market and some 60 percent of the

JGB market. The CGB market would potentially qualify as a serious contender of a global asset class.

This policy move offers a number of other distinct advantages, three of which are highlighted here.

First, this scheme could consolidate fragmented, illiquid, non-tradable, and captive public-sector liabilities into a homogeneous and larger CGB market. This would enhance bond market liquidity, as market size and liquidity tend to be positively and highly correlated. A bigger market would in turn enhance the CGBs as an attractive global asset class for international investors, by accommodating more domestic and foreign players and better absorbing shocks arising from potential volatile cross-border capital movements in the context of a more open capital account.

The net effect on the budding offshore CGB market, however, is ambiguous, as a much more liquid and sizable onshore CGB market could imply a less viable offshore cousin in the long term.

Second, a large, integrated, and liquid CGB market permits more regular benchmark issues of good size, which facilitates a more efficient and reliable benchmark yield curve and support the development of a nascent CGB futures market. This in turn facilitates the development of broader Chinese credit and derivatives markets.

Third, this proposed public-sector liability consolidation scheme also helps lessen the implicit tax burden of high reserve requirements on Chinese commercial banks (Ma, et al 2013; McCauley and Ma, 2015). The Chinese RRR remains very high by international standards, even after a hypothetical reduction to 9 percent. Therefore, a meaningful reduction of reserve requirements not only funds benchmark treasury issues traded publically, but also helps cushion the net interest margins of commercial banks in the wake of interest rate deregulation, lessening resistance to financial liberalization.

Of course, there are downside and upside risks to this scheme. Three potential downside risks or concerns are highlighted here. First, its implementation requires a strong political commitment among various government agencies for policy coordination and sensible cost sharing. In particular, the interest rate paid by the PBOC on the required reserves is 1.62 percent, currently about half of the prevailing one-year CGB yield. This increased interest payment by the consolidated public sector would be born by the Chinese government but mirrors a de facto cut of implicit tax on Chinese banks, mitigating high financing costs in China. Of course, this cost can be partially offset by higher income tax because of stronger corporate earnings from lower interest payment and higher interest income.

Second, a higher level of headline gross sovereign indebtedness may concern rating agencies more if these rating agencies, for whatever reason, discriminate between central bank liabilities and headline MoF liabilities, as well as care more about gross than net debts.

This is indeed the case, as seen from Draghi’s pledge to “Do whatever it takes,” which received hugely positive market responses at a time when additional finance ministry borrowing was frowned upon by the markets. Under our proposed scheme of transforming PBOC liabilities into MoF liabilities, gross – but not net – MoF debts rise.

Third, an enlarged pool of outstanding MoF bonds held by the public may have uncertain effects on the general interest rate level and the yield curve in the Chinese economy. As the proposed scheme itself does not involve any material change in the balance of real demand for and supply of saving, there should not be sustained changes in the general real interest rate in the economy. As discussed earlier, an expanded pool of treasuries may facilitate the formation of a better functioning yield curve, which would in turn enhance efficiency of the bond market while potentially improving the transmission mechanisms of the emerging new monetary regime in China.

So, our baseline scenario still assumes no policy innovation of this sort before 2020 and instead assumes only organic 10 percent average yearly growth of the CGB market. A modest scale of fragmented and less traded public liabilities would be unlikely to attract international investors, let alone support the Chinese dream of a global currency.

There are also potential upside risks to our proposed policy move to consolidate heterogeneous public-sector liabilities at the national government level. The 18 percent RRR could be slashed all the way to 2 percent as part of financial liberalization and market development. In this case, the CGBs could triple in short order to a still manageable 40 percent of GDP.

Table 6 Foreign holdings of domestic government bonds
Percent of the total outstanding, year-end

	Korea	Japan	Thailand	Malaysia	India
2008	6.1	6.9	2.9	13.7	16.7
2009	7.0	6.0	3.2	15.5	18.6
2010	9.9	6.4	7.2	24.4	30.5
2011	11.2	8.5	11.5	28.8	30.8
2012	9.5	8.6	16.4	32.3	33.0
2013	10.8	8.3	17.4	30.8	32.5
2014*	10.6	8.9	17.6	31.9	38.1

Note: * As of Q3 2014.

Source: AsianBondsOnline. <http://asianbondsonline.adb.org/regional/data.php>.

A combination of organic 10 percent growth and doubling of CGB through public sector liability consolidation would expand the CGB market by a factor of almost three by 2020 over 2014. In this case, the CGB market could elevate itself into the ranks of the top three national government bond markets globally in 2020 (Figure 6). Although still only the one third the size of the U.S. Treasury market by 2020, it would exceed 60 percent of the JGB market, which will help underwrite the status of the RMB as a serious global currency. Indeed, unless the Abenomics is successful in moderating the rise of JGBs, the RMB may by then look like an appropriate global currency next to the yen.

Moreover, with a larger CGB market, Chinese policymakers may feel more comfortable with a rising share of foreign holdings (Ma and McCauley, 2013 and 2014). If the foreign holding share of this expanded CGB market is also to rise from the current low 2.6 percent to 10 percent – comparable to the current foreign ownership in the JGB market (Table 6) – by 2020 potential foreign holding in the onshore CGB market would increase seven times in our base case or ten times in the case of a bold scheme to consolidate public sector liabilities: from the RMB222 billion in 2014 to more than RMB1.5 trillion in 2020 (from USD36 billion to USD260 billion) in the base case and to RMB2.3 trillion (USD413 billion) in the bold policy case. This estimated 2020 foreign holding of CGBs would rival the Netherlands' entire national government bond market in 2014 (Table 7).

Table 7 Projections of the Chinese bond market and foreign holdings, 2020

Billion RMB (Billion USD)					
	Total outstanding		Foreign holding		Foreign share (2)/(1), %
2014					
Total	28,730	(4,626)	672	(108)	2.3
CGB	8,553	(1,377)	222	(36)	2.6
CDB	6,266	(1,009)	92	(15)	1.5
A. 2020^e — Organic growth scenario					
Total	59,289	(10,365)	5,929	(1,037)	10
CGB	15,152	(2,649)	1,515	(265)	10
CDB	12,368	(2,162)	1,237	(216)	10
B. 2020^e — Bold policy scenario					
Total	67,789	(11,851)	6,779	(1,185)	10
CGB	23,652	(4,135)	2,365	(413)	10
CDB	12,368	(2,162)	1,237	(216)	10

Notes: We assume the average annual growth rate is 10% for CGB, 12% for CDB and 12% for the total Chinese bond market. Under bold policy, the liability consolidation scheme will increase CGB outstanding by RMB8.5 trillion overnight. The RMB/USD exchange rate at the end of 2014 was 6.21 and is expected to be around 5.72 by 2020, assuming 1.5 percent appreciation per annum.

Source: Author's calculation.

If the offshore RMB-denominated bond market is also to expand faster thanks to a bigger and more liquid onshore CGB market (which would alleviate the concerns about the divided and diverted CGB market liquidity), the onshore and offshore CGB markets together could be mutually reinforcing, further lifting the potential scale of the investable CGBs in global investor portfolios.

Even so, the fragmentation of the Chinese bond market and the still partially managed interest rates will prove an impediment to traders' and speculators' ability to do the hedges and swaps that are essential to a world-class currency market. Above all, while there will undoubtedly be some increase in the use of the RMB for foreign exchange reserves, continued liquidity limitations may still hamper the CGB market from becoming a global asset class that could help underpin an emerging global reserve currency for the coming quarter century.

5 Government-backed debt securities

While the sovereign bonds are typically the core of the fixed-income market, often sovereign-backed or sponsored agency debt securities are also a major source of the bond market liquidity. In the case of the U.S., Fannie Mae and Freddie Mac are a case in point. This market segment of mortgage-backed securities (MBS) historically far exceeded the U.S. Treasuries prior to 2011 (Table 8). Such debt securities can be vast and often serve as an important asset class for foreign investors including the central banks and sovereign funds. Such securities have been a major source of market liquidity for the US dollar and indeed a core pillar of the U.S. financial system in light of their scale and depth.

While China's asset-backed securities have been lagging so far, their growth is set to accelerate in the years ahead, as discussed earlier. However, this market segment is unlikely to be sizable enough to become a major fixed-income asset over the next decade. Instead, other government-sponsored agency debt securities figure more prominently in China's case (Table 8). One such asset class consists of the bonds issued by the three main Chinese policy banks: China Development Bank (CDB), Export-Import Bank of China and Agricultural Development Bank of China. These policy bank bonds have the full sovereign backing and have expanded 5 times over the past decade. Similar to the U.S. agency bonds, these Chinese policy bank bonds outstanding collectively rival and even exceed the sovereign CGB market. Of the three policy banks, the CDB is the biggest issuer and of special interest to us.

Table 8 Comparison of CGB, Chinese policy bank bonds, UST and U.S. MBS

	China				U.S.			
	CGB		Policy bank bond		UST		MBS	
	Out-standing billion USD	Turnover ratio						
2004	292.1	0.2	165.9	0.9	3,943.6	33.1	6,289.1	8.6
2005	325.9	0.4	216.0	1.0	4,165.9	33.9	7,206.4	9.3
2006	359.3	0.5	286.4	1.3	4,322.9	30.0	8,376.0	8.2
2007	607.3	0.6	378.4	1.2	4,516.7	32.0	9,372.6	9.0
2008	689.2	0.8	528.4	2.3	5,774.2	27.1	9,457.6	9.2
2009	780.6	0.8	651.4	4.4	7,260.6	15.8	9,341.6	8.0
2010	880.7	1.4	762.2	4.6	8,853.0	16.3	9,221.4	8.6
2011	998.7	1.4	1,002.5	3.4	9,928.4	15.1	9,043.8	6.8
2012	1,119.6	1.4	1,244.9	3.2	11,046.1	12.4	8,814.9	8.0
2013	1,260.9	0.7	1,431.9	1.6	11,854.4	11.9	8,720.1	6.5
2014	1,376.2	0.7	1,602.2	1.7	12,504.8	10.0	8,729.2	5.2

Sources: SIFMA, and ChinaBond.com.

Moreover, some market indicators suggest that the policy bank bond market seems to be more liquid than the CGB market, as their turnover tends to be even higher than the CGB counterpart, for a combination of possible reasons.

First, the CGB issuance system so far has been mostly designed to fund budget shortfalls, with limited consideration of long-term capital market development. On the other hand, the CDB issues enjoy quasi-sovereign status but are more market-oriented. Second, the CDB has been more innovative and market-oriented, offering a greater variety of instruments such as callable and puttable bonds, zero coupon bonds, discount bonds, STRIPS and floating-rate bonds. Third, the higher issuance frequency of policy bank bonds means greater availability of on-the-run issues which are typically more liquid. Fourth, a bigger portion of policy bank bonds is concentrated in the shorter and often more liquid end of the yield curve than the CGBs. Finally, interest incomes from CGBs are tax-free but not the capital gains, encouraging a buy-and-hold strategy and thus depressing CGB trading. These observations also point to possible measures to improve market liquidity for a given CGB market size.

Therefore, the Chinese policy bond market, especially the CDB bonds, represents a big and attractive asset class within the Chinese fixed-income market. As discussed earlier (Table 2), the size of the policy bank bond market segment may double between 2015 and

2020, meaningfully adding to the high-rated RMB fixed-income assets. If international investor appetite for policy bank bonds is the same as that for the CGBs in 2020, their foreign holding could increase about 14 times by 2020 over 2014, easily reaching RMB2 trillion (USD350 billion).

However, the CGB and CDB bonds may also potentially compete and split the same pool of the overall bond market liquidity, resulting in a less robust Chinese benchmark yield curve. Historically, non-sovereign issues can also serve as the useful domestic benchmark yield curve, but not multiple and competing benchmark issuers at the same time.

6 Summary

A big, deep, and liquid CGB and policy bank bond market can facilitate the emergence of the RMB as a global currency, by offering a big and liquid RMB fixed-income asset class. The CGB market currently is the seventh largest worldwide and only about one tenth of the U.S. treasury market size. Trend growth may bring the CGB market neck-and-neck with a major euro sovereign market by 2020 but will not be enough to make it to a top-three treasury market globally.

Financial liberalization, capital opening and a bold public-sector liability consolidation scheme can boost the CGB market, by enhancing market integration and liquidity and by lifting the CGB market to the position of a top-three treasury market after the U.S. treasury market and the JGB market by 2020. The policy bank bonds can also be a sizable RMB fixed-income asset class, rivaling both the scale and liquidity of the CGB market. But the Chinese leadership must find a way to overcome the institutional weakness of market and regulatory fragmentation and moral hazard.

By 2020, we believe that foreign holdings of CGBs and policy bank bonds combined can reach RMB2.7 trillion (USD470 billion) under the business-as-usual scenario and RMB3.5 trillion (USD620 billion) in a public sector liability consolidation scenario. These amount to rises of 9 times and 12 times over the levels in 2014 and equivalent to 4 percent and 5 percent of the USD11.6 trillion global foreign exchange reserve, respectively. If so, the Chinese bond market is likely to become a big, investable RMB asset class, facilitating the emergence of a potential global RMB.

References

- ASIFMA (2013): China Bond Market Roadmap RMB.
- Bai, Jennie, Michael Fleming and Casidhe Horan (2013): “The Microstructure of China’s Government Bond Market”, Federal Reserve Bank of New York Staff Report, No. 622.
- Bank for International Settlements (BIS, 2002): “The development of bond markets in emerging economies”, BIS Papers No 11.
- Cheung, YW, Guonan Ma and Robert McCauley (2011): “Renminbising China’s Foreign Assets”, *Pacific Economic Review*, Vol 16, No 1, pp 1–17.
- Committee on the Global Financial System (1999a): “Market liquidity: research findings and selected policy implications”, CGFS Working Group Reports, no 11, May.
- (1999b): “How should we design deep and liquid markets? The case of government securities”, CGFS Publications, No 13, October.
- Greenspan, Allan (1999): “Do efficient financial markets mitigate financial crises?”, speech at the 1999 Financial Markets Conference of the Federal Reserve Bank of Atlanta, October 19.
- Huang, Haizhou and Ning Zhu (2007): “The Chinese Bond Market: Historical Lessons, Present Challenges and Future Perspectives”, paper presented at the BIS-CEPR-HMKA conferences.
- Ma, Guonan (2007): “Who pays China’s bank restructuring bill?,” *Asian Economic Papers*, 6 (1), pp 46–71, MIT Press.
- Ma, Guonan and Robert McCauley (2014): “Financial openness of China and India – Implications for capital account liberalisation”, in L Song, R Garnaut, and Cai Fang (ed) *Deepening Reform for China’s Long-Term Growth and Development*, Australian National University Press.
- (2013): “Is China or India more financially open?”, *Journal of International Money and Finance*, No 39, pp 6–27.
- (2008): “The efficacy of China’s capital controls — Evidence from price and flow data”, *Pacific Economic Review*, Vol 13, No 1, pp 104–123.
- Ma, G, X Yan and X Liu (2013): “China’s reserve requirements: practices, effects and implications”, in *China Economic Policy Review*, Vol 1, No 2 pp 1–34.
- Ma, Guonan, Eli Remolona and He Jianxiong (2006): “Developing corporate bond markets in Asia: a synopsis of the Kunming discussions”, in *Developing Corporate Bond Markets in Asia*, BIS Paper 26, pp 1–6.
- McCauley, Robert and Guonan Ma (2015): “Consolidating public sector debts in China”, *China and World Economy*, pp 1–18, Vol 23, No. 4
- McCauley, Robert (2003): “Unifying government bond markets in East Asia”, *BIS Quarterly Review*, December, pp 89–98.
- McCauley, Robert and E Remolona (2000): “Size and liquidity of government bond markets”, *BIS, International Banking and Financial Market Developments*, November, pp 52–58.

Mu, Huaipeng (2006): “The development of China’s bond market”, in Developing Corporate Bond Markets in Asia, BIS Paper 26, pp 56–60.

Overholt, William, Guonan Ma and CK Law (2016): Renminbi Rising: A New Global Monetary System Emerges, Wiley Publisher (Amazon booksore: <http://www.amazon.com/Renminbi-Rising-Global-Monetary-Emerges/dp/1119218969>).

Standard and Poor’s (2009): Chinese Bond Markets – An Introduction.

Véron, Nicolas and Guntram B. Wolff (2015): “Capital Markets Union: a vision for the long term”, Bruegel Policy Contribution, Issue 2015/05.

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