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Testing the 'Impossible Trinity' Part I: Nine questions around local gov. debt

Shuo Yang, Ph.D.
+852-2978-0701 | shuo.yang@gs.com
Goldman Sachs (Asia) L.L.C.

We introduce the first report in our 3-part *Testing the 'Impossible Trinity'* series, which looks at the idea that banks cannot maintain a good balance of provisions, capital and dividends at the same time owing to squeezed earnings. In this report, we assume local gov. debt default risk will be limited as long as debt rollover is permitted and net balances continue to increase, and assess the potential multi-year margin loss of banks on the back of local gov. debt rollover due to lowering rates.

We look at nine questions that we think will be top of mind for investors and group these questions under three broad themes.

The first theme concerns the local gov. debt exposure on bank balance sheets, in terms of size, mix and distribution. We conclude non-covered banks with 48% local gov. debt to total assets (vs. 18% for covered banks) would face more challenges with potential tail risk. Inferring from this, we expect six large banks with larger balance sheets to step up and take on more local gov. debt.

The second theme is bank earnings risk, due to margin loss on local gov. debt. We use a loss assumption of Rmb ~30tn (USD 4.5tn) gross addition of local gov. debt and a ~30bps effective rate decrease each year, with banking system ROE decreasing by ~100bps, and non-covered banks by ~150bps each year in 2023E-25E. Based on this, we stress-test that a ~60bps rate cut per year on local gov. debt would trigger non-covered banks to face recapitalization risk with ROE declining to 1.7%.

Our third theme assesses risk factors of local gov. debt widening the divergence of individual banks. We highlight two sets of banks to see how these factors affect divergence: 1) **ABC** (downgrade to Sell, from Neutral) and **PSBC** (upgrade to Buy, from Sell) on the size of local gov. debt, and 2) **ICBC** (downgrade to Sell from Buy) and **CCB** (maintain Buy) on the % of local gov. bonds.

For our investment views on each bank, please see the third report in this series, *Testing the 'Impossible Trinity' III: Increasing dividend risk;* ***PSBC*** *up to Buy,* ***ICBC/ABC/Industrial*** *down to Sell*.

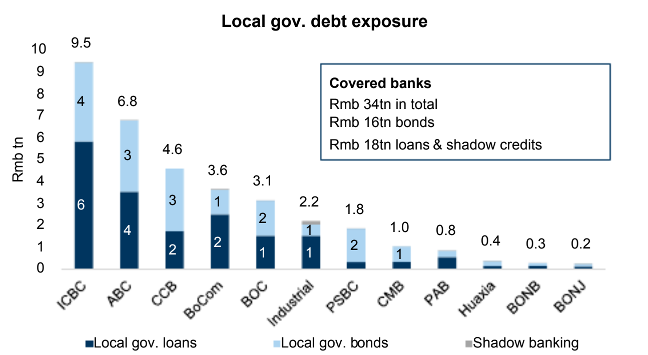
Nine Questions around local gov. debt on bank balance sheets

1. What's the size and mix of local gov. debt on bank balance sheets?

Based on our economists' numbers, we estimate Rmb 34tn (USD 4.9tn) of local gov. debt sits on the balance sheets of covered banks, which account for 61% of banking assets. There are two elements to local gov. debt, namely loans (including shadow credit) of Rmb 18tn (USD 2.6tn) and bonds of Rmb 16tn (USD 2.3tn), on our estimates.

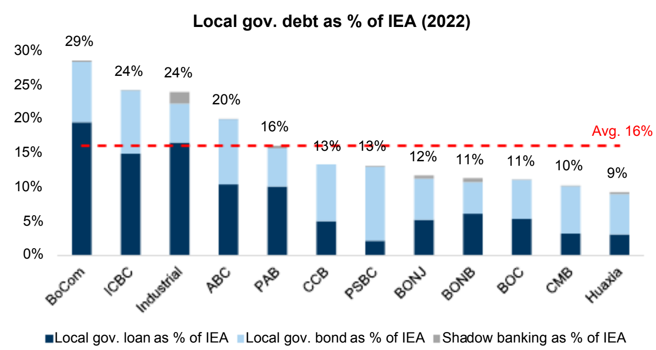
We arrive at this by summing up loans with a tenor of more than 5 years (excluding mortgages), and use the average portfolio share of ~48% for local gov. bonds held by banks. We also include shadow credit in local gov. debt and summarize it as part of loans.

Exhibit 1: We assess Rmb 34tn(USD 4.9tn) local gov. debt on balance sheets of covered banks, accouting for 61% of banking assets, with loans (including shadow credit) of Rmb 18tn(USD 2.6tn) and bonds of Rmb 16tn(USD 2.3tn).
As of 2022, GSe



Source: Goldman Sachs Global Investment Research, Company data

Exhibit 2: BoCom/Huaxia have largest/smallest local gov. debt exposure (as % of IEA) at 29%/9%, with 16% avg. of covered banks.
As of 2022, GSe

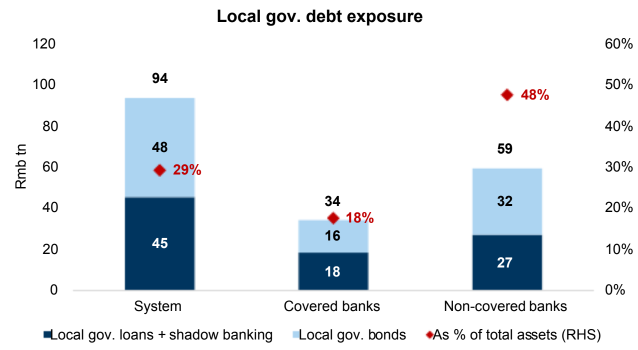


Source: Goldman Sachs Global Investment Research, Company data

2. What about the local gov. debt exposure of non-covered banks ?

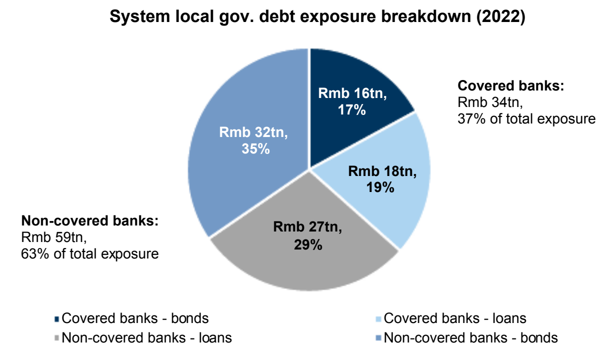
We estimate non-covered banks, which account for 39% of banking assets, have Rmb 59tn (USD 8.5tn) of local gov. debt, making up 63% of the total based on GS economists' estimates of total local gov. debt. We also estimate that non-covered banks account for 48% of local gov. debt as a % of total IEA, vs. 18% for covered banks, suggesting more earnings risk on potential margin loss on local gov. debt given the larger size.

Exhibit 3: Covered banks have Rmb 34tn(USD 4.9tn) local gov. debt, 18% of total assets, vs. Rmb 59tn(USD 8.5tn) and 48% of total assets for non-covered banks.
As of 2022, GSe



Source: Goldman Sachs Global Investment Research, Company data

Exhibit 4: System local gov. debt exposure breakdown
As of 2022, GSe

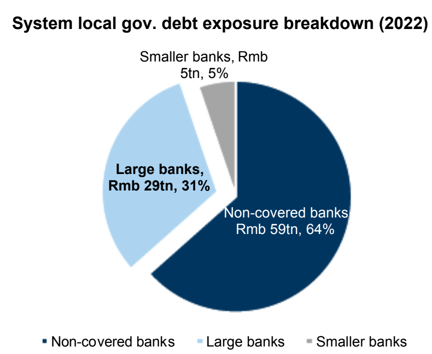


Source: Goldman Sachs Global Investment Research, Company data

3. Do large banks have larger exposure to local gov. debt ?

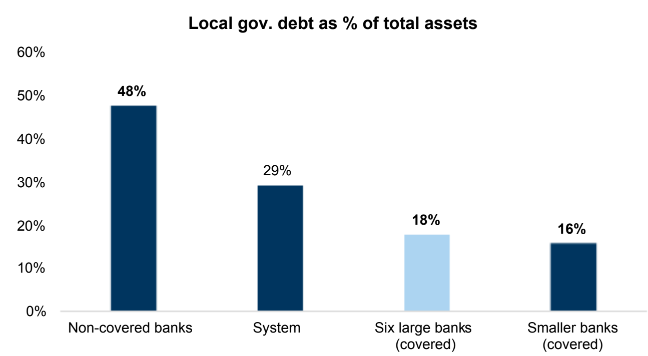
The six large banks (**ICBC, CCB, ABC, BOC, BoCom, PSBC)** account for Rmb 29tn (USD 4.2tn) of local gov. debt, 31% of the estimated system total, based on GS economists' estimates. And we assume larger banks can support more local gov. debt growth due to their sizable balance sheets, with local gov debt as a % of IEA at 18%, compared with 29% for the system. With a 1% increase in exposure, we believe these six banks could support additional local gov. debt of Rmb 1.6tn (USD 0.2tn), potentially offsetting the slowdown in growth of local gov. debt on non-covered bank balance sheets, as we assess the exposure would be 48%.

Exhibit 5: Six large banks total Rmb 29tn(USD 4.2tn) local gov debt, 31% of estimated system total.
As of 2022, GSe



Source: Goldman Sachs Global Investment Research, Company data

Exhibit 6: We expect large banks can support more local gov. debt growth on their large balance sheet, with local gov. debt as 18% of IEA, vs. 29% of system.
As of 2022, GSe



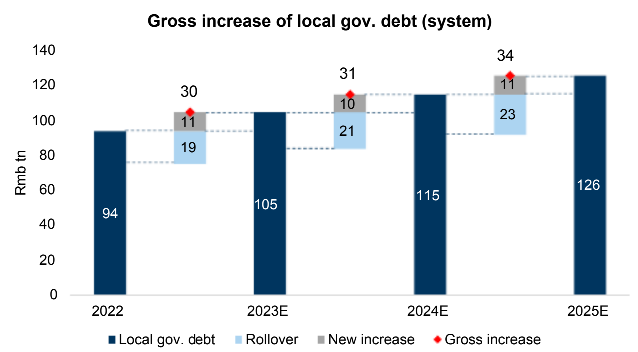
Source: Goldman Sachs Global Investment Research, Company data

4. What's the gross and net addition of local gov. debt each year ?

We estimate Rmb ~30tn (USD 4.5tn) of gross addition of local gov. debt each year to 2025E, with Rmb 20tn (USD 3.0tn) rollover balance and Rmb 10tn (USD 1.5tn) net addition.

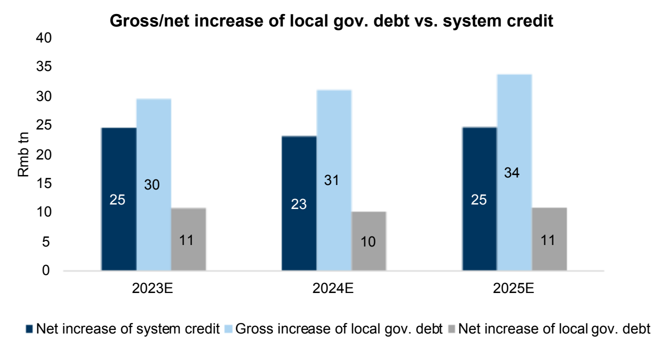
For the purposes of this analysis, we assume an average 5 year duration of local gov. debt, and unchanged weights of local gov. debt on bank balance sheets. This would mean 20% of local gov. debt rollover and ~10% balance growth each year.

Exhibit 7: We estimate Rmb 30/31/34tn(USD 4.2/4.4/4.8tn) gross local gov. debt increase, with Rmb 19/21/23tn(USD 2.7/3.0/3.3tn) of rollover and Rmb 11/10/11tn(USD 1.5/1.4/1.5tn) of net increase in 2023E/24E/25E...



Source: Goldman Sachs Global Investment Research, Company data

Exhibit 8: ...compared with new system credit growth addition of Rmb 25/23/25tn(USD 3.5/3.3/3.5tn), assuming annual balance growth of ~10%.



Source: Goldman Sachs Global Investment Research, Company data

5. What's the potential margin loss on local gov. debt?

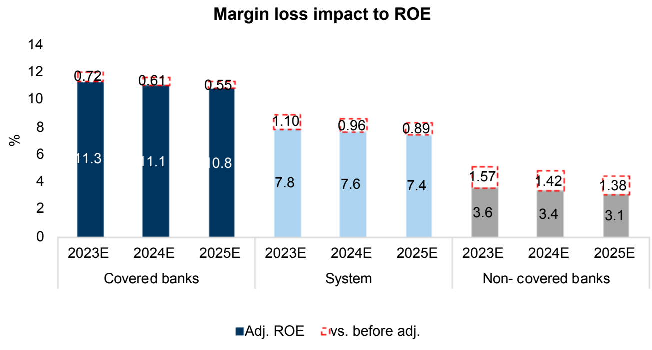
We estimate system ROE will decrease by ~100bps each year in 2023E-25E, due to margin loss on local gov. debt, else being equal. Looking at covered banks, we arrive at a ~60bps ROE decrease, and non-covered banks at ~150bps.

We quantify the margin risk of both stock rollover and increased flows of local gov. debt, assuming default risk is limited as long as rollover is allowed and net balances increase. We expect lowering rates on both stock rollover and increases in local gov. debt flows given the increasing size and difficulty of preventing default risk. We assume a 1% rate decrease on rollover debt each year and ~150 bps spread loss between local gov. debt and the overall bank rate as opportunity cost to model the margin loss of local gov. debt.

This implies the effective interest rate on local gov. debt would decrease by ~30bps each year on average in 2023E-25E. This would translate into a NIM decrease of covered banks by an average 3-10bps each year in 2023E-25E. We believe **ICBC/ABC/Industrial bank** would have a larger NIM contraction of 7.3/6.6/9.4bps vs. the 6.0bps average for covered banks each year 2023-25E, while **CMB** and **BOC** would have a smaller NIM decrease of 4.0/3.3bps, mainly due to the size of local gov. debt. The more local gov. debt held by banks, the more NIM dilution.

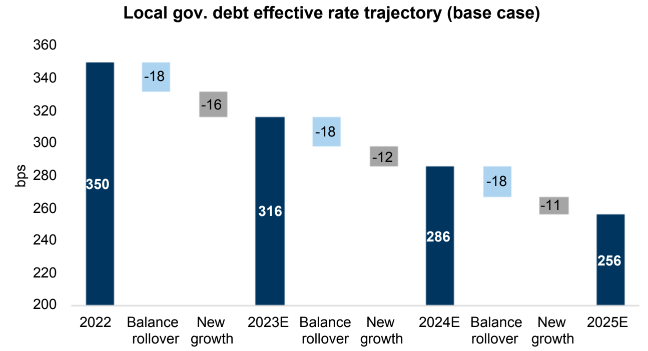
Based on these assumptions, and with the multi-year margin contraction led by lowering rates of increasing local gov. debt, banking system CET1 ratio could be 9.9%, with that of non-covered banks remaining above the minimum requirement at 7.9% by end-2025E, although the CET1 ratio would decrease by ~80bps cumulatively in 2023E-25E.

Exhibit 9: We estimate system ROE decrease by ~100bps each year in 2023E-25E, due to margin loss on local gov. debt, else being equal. Compared with covered banks which at a ~60bps ROE decrease, non-covered banks would decrease c. ~150bps.



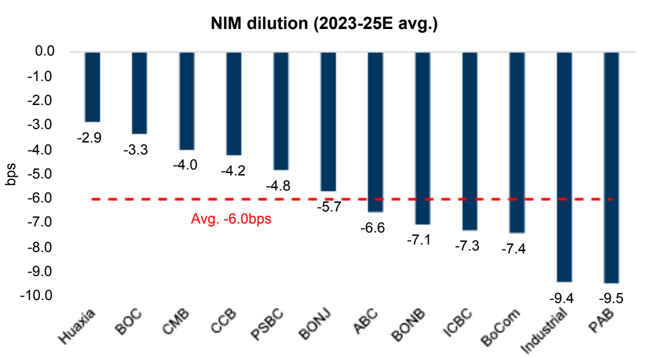
Source: Goldman Sachs Global Investment Research, Company data

Exhibit 10: The effective rate cut each year would be ~30bps, with 1% rate cut for 20% balance rollover and 150bps opportunity cost for ~10% new growth, which would translate to a NIM decrease of covered banks by 3-10bps each year in 2023E-25E.



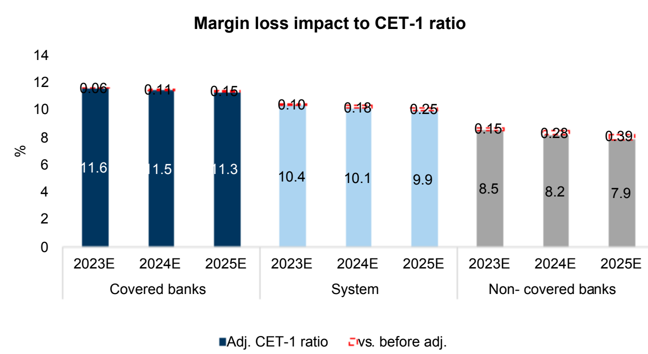
Source: Goldman Sachs Global Investment Research, Company data

Exhibit 11: We highlight ICBC/ABC/Industrial bank would have larger NIM contraction of 7.3/6.6/9.4bps vs. 6.0bps average of covered banks each year in 2023-25E, while CMB and BOC would have a smaller NIM decrease of 4.0/3.3bps, mainly due to the size of local gov. debt.



Source: Goldman Sachs Global Investment Research, Company data

Exhibit 12: On our assumptions, with the multi-year margin contraction led by lowering rates of increasing local gov. debts, banking system CET1 ratio could be 9.9%, with that of non-covered banks remaining above the min. requirement at 7.9% by end-2025E, though the CET1 ratio would decrease by ~80bps cumulatively in 2023E-25E.



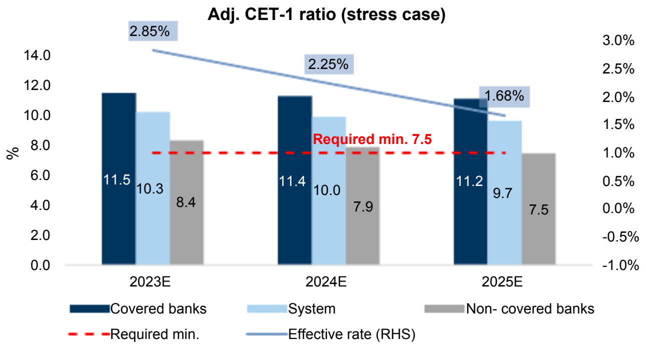
Source: Goldman Sachs Global Investment Research, Company data

6. How low could the rates on local gov. debt go?

Our stress-test shows that, if the effective interest rate on local gov. debt decreases by 183bps cumulatively in 2023E-25E, or ~60bps each year, non-covered banks would face recapitalization risk with the CET1 ratio dipping below 7.5%, the min. requirement, by end-2025E. And the system ROE would be 6.6% vs. 7.4% in our base case, with covered/non-covered banks ROE at 10.3%/1.7% vs. 10.8%/3.1% of our base case in 2025E.

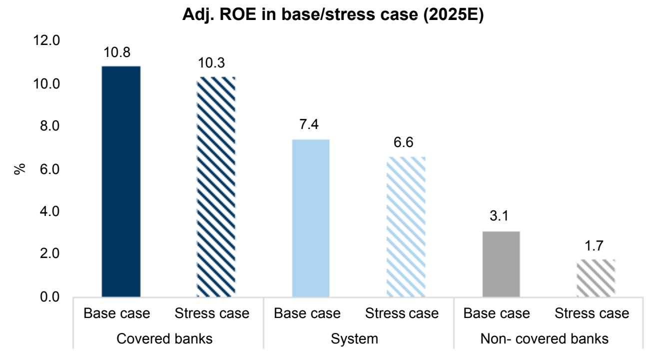
This suggests that, before reaching the point of non-covered banks (39% of banking assets) requiring recapitalization: 1) the effective interest rate on local gov. debt could go lower, as our stress test suggests 30bps more rate cuts each year or ~100bps lower in total for 2023E-25E; or 2) more time could be allowed for debt rollover, assuming a fixed setup of rate cuts on local gov. debt in our base case, else being equal.

Exhibit 13: We stress-test that with effective interest rate on local gov. debt decreasing by ~60bps each year, non-covered banks would face recapitalization risk with the CET1 ratio dipping below 7.5%, the min. requirement by end-2025E.



Source: Goldman Sachs Global Investment Research, Company data

Exhibit 14: The system ROE would be 6.6% vs. 7.4% base case, and covered/non-covered banks ROE would arrive at 10.3%/1.7% vs. 10.8%/3.1% of base case in 2025E.

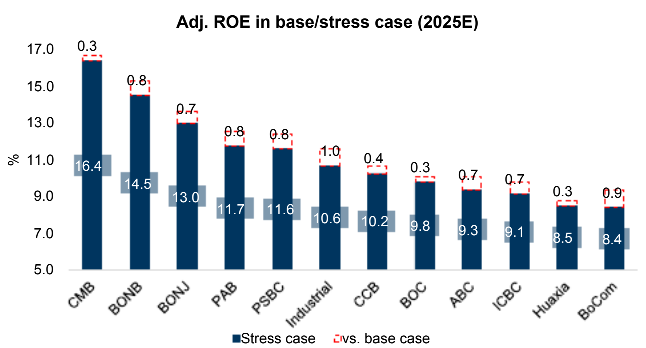


Source: Goldman Sachs Global Investment Research, Company data

7. What would happen to covered banks if the local gov. debt rate went lower towards the need for recapitilization?

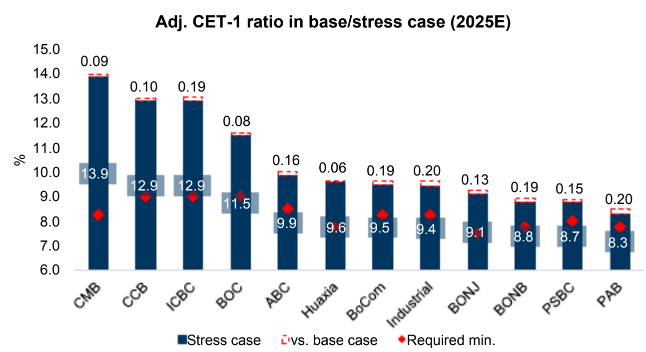
If we stress test rates on local gov. debt going lower at ~60bps each year in 2023E-25E, we could see covered banks have a NIM decrease of 12bps each year, driving ROE and CET1 ratio decrease by ~120/10bps each year, assuming credit cost does not climb up and else being equal. By the end-2025E, the stress tested ROE and CET1 ratio would be 10.3%/11.2% on average, or 52/14bps lower than the base case.

Exhibit 15: With the stress test to set rates on local gov. debt is to lower at ~60bps each year in 2023E-25E vs. base case of ~30bps, ROE of covered banks would be 10.3%, or 52bps lower than of base case...



Source: Goldman Sachs Global Investment Research, Company data

Exhibit 16: ...and CET-1 ratio would be 11.2%, or ~14bps lower than base case, by the end-2025E.



Source: Goldman Sachs Global Investment Research, Company data

8. Does the local gov. debt mix matter as an offset to bank earnings?

With more bonds in local gov. debt portfolios, and more tax (0% tax rate vs. ~15% of loans) and capital savings (10% (LGGB) or 20% (LGSB) risk weighting vs. 100% of loans), it means banks can better offset the margin loss on local gov. debt.

Therefore, we believe the % of bonds in local debt portfolios is an important factor in differentiating banks' bottom-line growth.

Most banks guide they would like to take more local gov. bonds onto their balance sheets; despite nominal yields on local gov. bond not being high, the tax and capital savings can provide more upside to adj. return. Banks also guide that if the central bank allows more local gov. bonds as qualified collateral for liquidity, local gov. bonds can be more attractive assets to enhance debt portfolio returns, amid lowering rates.

We estimate the system adjusted local gov. debt yield could be 0.8% higher on average in 2023E-25E, thanks to the tax and capital benefits of local gov. bonds.

We estimate the weighted capital charges of local gov. bonds could be 39%, blended by 29% of LGGB (local government general bonds) with a 10% risk weighting, 43% of LGSB (local government general bonds) with a 20% risk weighting, and 28% of implicit LGFV (local government financing vehicle bonds) with a 100% risk weighting. This could help banks save capital by 61%, compared with loans which require 100% risk weighting. We believe the saved capital could drive additional returns on normalized ROE of 11% for covered banks, assuming the return on capital for each covered bank remains unchanged.

Thereby, with inclusion of the tax and capital benefits of local gov. bonds, we could see the decrease in ROE due to margin loss of local gov. debt narrow by 1.1ppts for covered banks and 1.9ppts for non-covered banks.

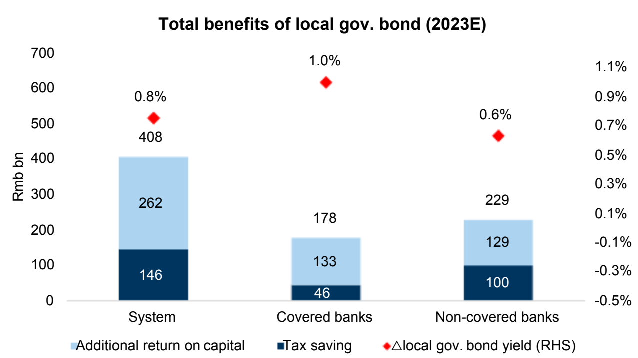
Within our coverage, we have banks with larger local gov. bond exposures, i.e. **PSBC/CMB** (83%/68% bond % local gov. debt), and banks with smaller exposures, i.e. **Industrial** and **BoCom** (24%/31%), compared with the 50% average of covered banks.

Exhibit 17: More bonds in the local gov. debt portfolios, more tax (0% tax rate vs. ~15% of loans) and capital savings (10%(LGGB) or 20% (LSGB) risk weighting vs. 100% of loans) mean banks can offset the margin loss of local gov. debt

Rmb tn	Balance	Mix	Mix (bond)	Tax rate	Risk weighting
Total local gov. debt (onshore)	**94**	**100%**		**9%**	**69%**
Local gov. bond (onshore)	**48**	**52%**	**100%**	**4%**	**39%**
Official	35	37%	72%	0%	16%
LGGB	14	15%	29%	0%	10%
LGSB	21	22%	43%	0%	20%
Implicit (LGFV bond)	14	14%	28%	15%	100%
Local gov. loan	**45**	**48%**		**15%**	**100%**

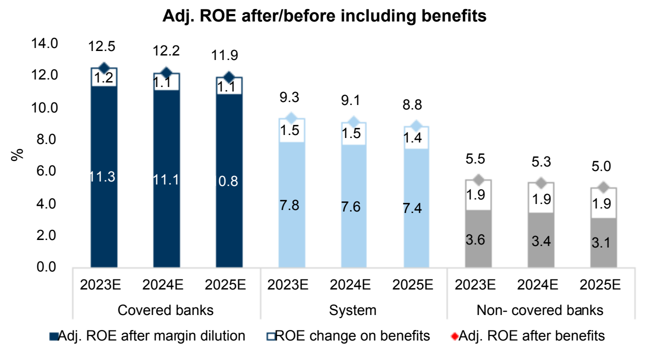
Source: Goldman Sachs Global Investment Research, Company data

Exhibit 18: We estimate the system adjusted local gov. debt yield could be 0.8% higher on average in 2023E-25E, thanks to the tax and capital benefits of local gov. bonds.



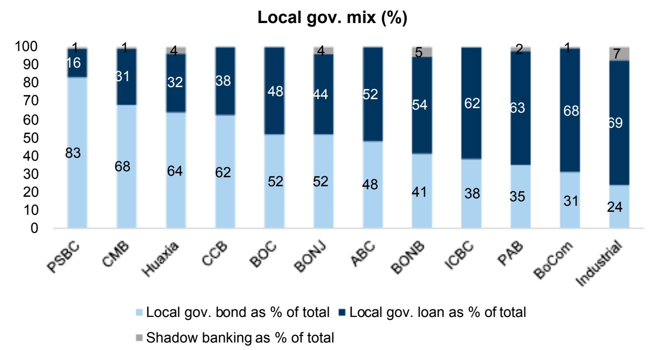
Source: Goldman Sachs Global Investment Research, Company data

Exhibit 19: With the inclusion of the tax and capital benefits of local gov. bonds, we could see the decrease in ROE due to margin loss of local gov. debt narrowing by 1.1ppts for covered banks and 1.9ppts for non-covered banks.



Source: Goldman Sachs Global Investment Research, Company data

Exhibit 20: Within our coverage, we have banks with larger local gov. bond exposures, PSBC/CMB (83%/68% bond % local gov. debt), and banks with smaller exposures, Industrial and Bocom (24%/31%), compared with the 50% average of covered banks.
As of 2022, GSe



Source: Goldman Sachs Global Investment Research, Company data

9. What's the potential earnings impact for covered banks?

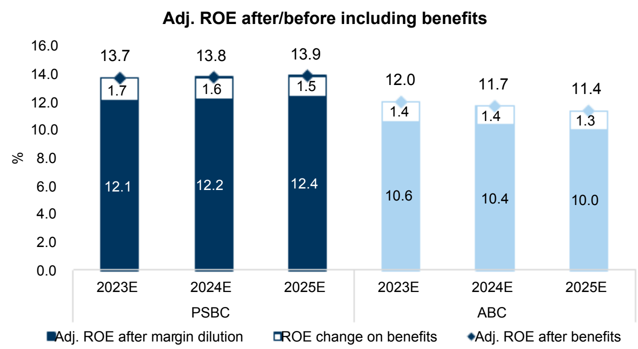
We estimate an average 6bps PPOP ROA decrease for our covered banks in 2023E-25E due to margin loss on local gov. debt. With the inclusion of tax and capital savings, we could see a lower ROE decrease for our covered banks, by ~1.1ppts each year to 12.5%/12.2%/11.9% in 2023E-25E.

We think both size and mix of local gov. debt are factors that differentiate banks, as we expect the larger levels of local debt held by banks, the more margin loss on the back of lowering rates of local gov. debt, while the more bonds in local gov. debt portfolios, the more tax and capital benefits can narrow the bottom-line decrease. Thus, we screen our covered banks, and highlight two groups: 1) **ABC** (downgrade to Sell, from Neutral) and **PSBC** (upgrade to Buy, from Sell) on the size of local gov. debt, and 2) **ICBC** (downgrade to Sell, from Buy) and **CCB** (maintain Buy) on the % of local gov. bonds (see Part III in the series for investment views of each bank).

- **ABC** and **PSBC** on the size of local gov. debt, given their similarly strong deposit bases. ABC has 20% local gov. debt as a % of IEA, compared with 13% for **PSBC**. Assuming local gov. debt on both banks rolls over with lowering rates, the PPOP ROA of **ABC** would decrease by 7bps each year on average in 2023E-25E, compared with 5bps of **PSBC**, else being equal. Moreover, when factoring in the tax and capital savings of local gov. bonds - **PSBC** has 83% bond exposure in their local gov. debt portfolio, compared with 48% for **ABC -** the savings could help **PSBC** narrow its ROE decrease by 160bps each year on average in 2023E-25E, vs. 139bps at **ABC**.
- **ICBC** and **CCB** on their local gov. mix, as **ICBC** has 38% exposure to local gov. bonds, compared with 62% for CCB. The more local gov. bonds, the more capital and tax savings to mitigate earnings pressure caused by local gov. debt. We compare **ICBC** with **CCB** as the two stocks generally trade in the same direction, and as investors see few differences between the two. However, we think local gov. debt can widen the divergence. If we look at these banks' reported data and apply

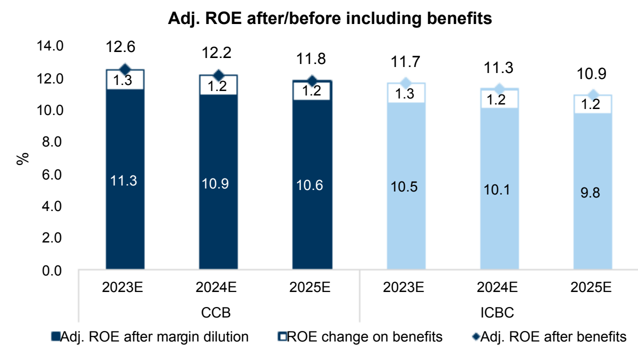
the same assumptions as our margin loss test, we estimate **ICBC** could see PPOP ROA decrease by 7bps each year on average in 2023E-25E, compared with 4bps for **CCB**. If we include tax and capital savings, the margin loss on the bottom line could narrow more for **CCB,** with ROE decreasing less by 125bps each year on average in 2023E-25E, compared with 120bps for **ICBC**.

Exhibit 21: PSBC/ABC has 13%/20% local gov. debt exposure as % of IEA, with ROE adjusted for margin loss and bond benefits at 13.8%/11.7% on average in 2023-25E.



Source: Goldman Sachs Global Investment Research, Company data

Exhibit 22: ICBC/CCB has 38%/62% local gov. bond mix, with ROE adjusted for margin loss and bond benefits at 12.2%/11.3% on average in 2023-25E.



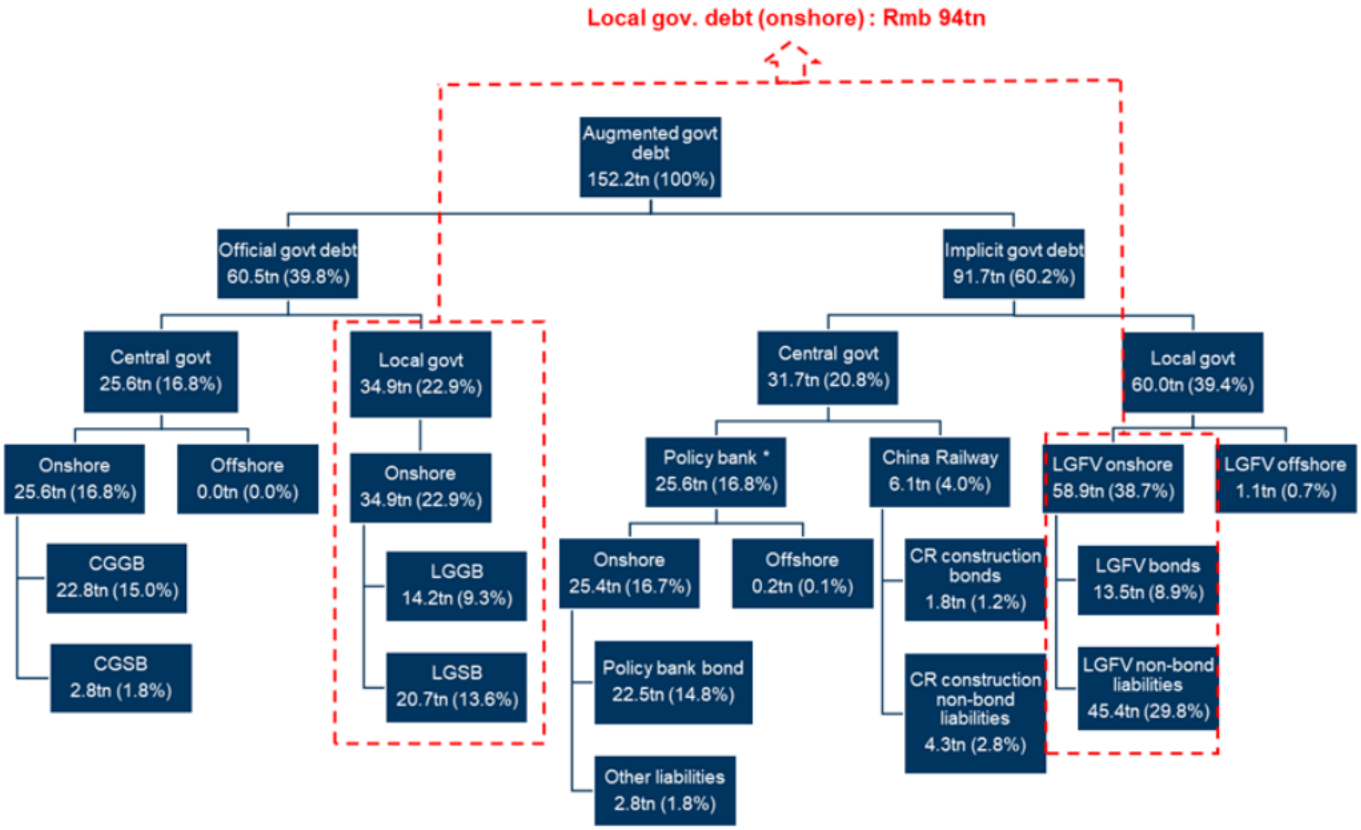
Source: Goldman Sachs Global Investment Research, Company data

The author would like to thank Zihan Wang and Claire Ouyang for their contributions to this report.

Appendix

Based on GS macro team estimates for gov. debt, we sum up official local gov. debt of Rmb 34.9tn (USD 5.0tn) and implicit onshore local gov. debt of Rmb 58.9tn (USD 8.4tn) (incl. Rmb 13.5tn (USD 1.9tn) of bond and Rmb 45.4tn (USD 6.5tn) loans and shadow credits), to get to the total onshore local gov. debt exposure of Rmb ~94tn (USD 13.4tn).

Exhibit 23: Local gov. debt (onshore) is estimated to be Rmb 94tn(USD 13.4tn), as of 2022.



Estimates from GS macro team.

Source: Goldman Sachs Global Investment Research, MOF, Wind, Bloomberg, CEIC

Disclosure Appendix

Reg AC

I, Shuo Yang, Ph.D., hereby certify that all of the views expressed in this report accurately reflect my personal views about the subject company or companies and its or their securities. I also certify that no part of my compensation was, is or will be, directly or indirectly, related to the specific recommendations or views expressed in this report.

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GS Factor Profile

The Goldman Sachs Factor Profile provides investment context for a stock by comparing key attributes to the market (i.e. our coverage universe) and its sector peers. The four key attributes depicted are: Growth, Financial Returns, Multiple (e.g. valuation) and Integrated (a composite of Growth, Financial Returns and Multiple). Growth, Financial Returns and Multiple are calculated by using normalized ranks for specific metrics for each stock. The normalized ranks for the metrics are then averaged and converted into percentiles for the relevant attribute. The precise calculation of each metric may vary depending on the fiscal year, industry and region, but the standard approach is as follows:

Growth is based on a stock's forward-looking sales growth, EBITDA growth and EPS growth (for financial stocks, only EPS and sales growth), with a higher percentile indicating a higher growth company. **Financial Returns** is based on a stock's forward-looking ROE, ROCE and CROCI (for financial stocks, only ROE), with a higher percentile indicating a company with higher financial returns. **Multiple** is based on a stock's forward-looking P/E, P/B, price/dividend (P/D), EV/EBITDA, EV/FCF and EV/Debt Adjusted Cash Flow (DACF) (for financial stocks, only P/E, P/B and P/D), with a higher percentile indicating a stock trading at a higher multiple. The **Integrated** percentile is calculated as the average of the Growth percentile, Financial Returns percentile and (100% - Multiple percentile).

Financial Returns and Multiple use the Goldman Sachs analyst forecasts at the fiscal year-end at least three quarters in the future. Growth uses inputs for the fiscal year at least seven quarters in the future compared with the year at least three quarters in the future (on a per-share basis for all metrics).

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