

2. Corporate Leverage in Asia: A Fault Line?

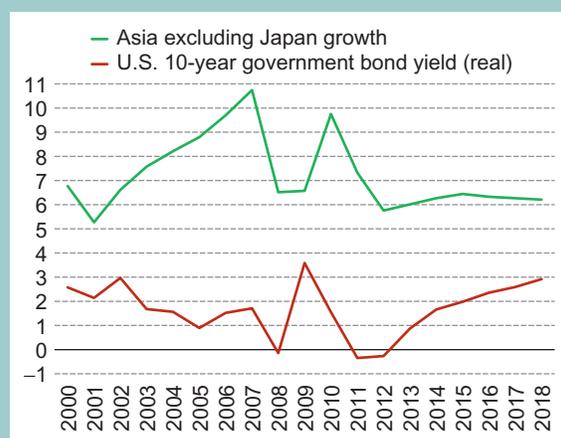
Introduction and Main Findings

In the aftermath of the global financial crisis, corporate leverage in *emerging Asia* has risen and may represent a “fault line.” This fault line is hidden beneath the surface but has the potential to amplify shocks as global liquidity conditions tighten, interest rates rise, and growth slows (Figure 2.1). While the outlook for the region remains solid (Chapter 1), household indebtedness has risen across the region (Box 2.1) as has corporate leverage in the major emerging economies (Figure 2.2). This could weigh on growth as interest rates rise and firms and households enter a deleveraging cycle, cutting both investment and consumption to strengthen their balance sheets. In a worst-case scenario, corporate and household defaults could rise, with adverse effects on bank balance sheets, the availability and price of credit, and growth. Unlike in Emerging

Asia, corporate leverage ratios have remained broadly stable or have declined in *advanced Asia* (Figure 2.2).

This chapter documents the dynamics of corporate indebtedness in advanced and emerging Asia and analyzes the implications for investment. Using firm-level data covering 18,000 companies during 1995–2012, it assesses the overall level and *distribution of* debt and leverage over time in 14 emerging and advanced Asian economies. In addition, liquidity and solvency indicators are used to gauge the extent to which leverage could represent a source of systemic risk. Finally, to assess the macroeconomic risks of corporate leverage, simple stress tests are performed to quantify the effects of interest rate and growth shocks on firms’ solvency and the potential impact on investment decisions.

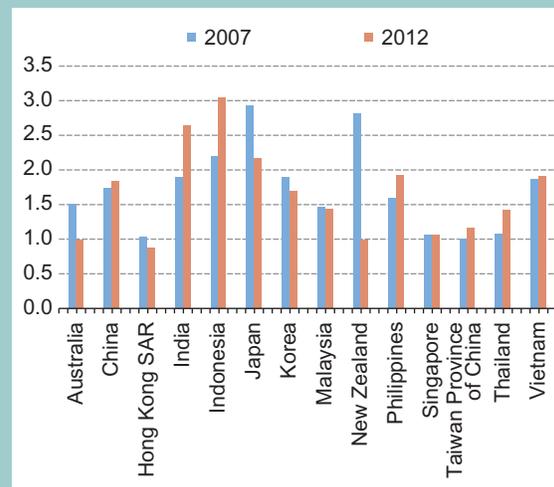
Figure 2.1
Asia: Real GDP Growth and U.S. Real Rates
(Excluding Japan)



Source: IMF, World Economic Outlook database.

The main authors are Roberto Guimarães-Filho, Shi Piao, and Longmei Zhang.

Figure 2.2
Leverage Ratio Comparison¹
(Total debt weighted average, 2007 and 2012)



Sources: Thomson Reuters Worldscope; and IMF staff calculations.
¹ Leverage ratio is measured by total debt/common equity.

Box 2.1

Rising Household Debt and House Prices in Asia: Are Household Balance Sheets at Risk?¹

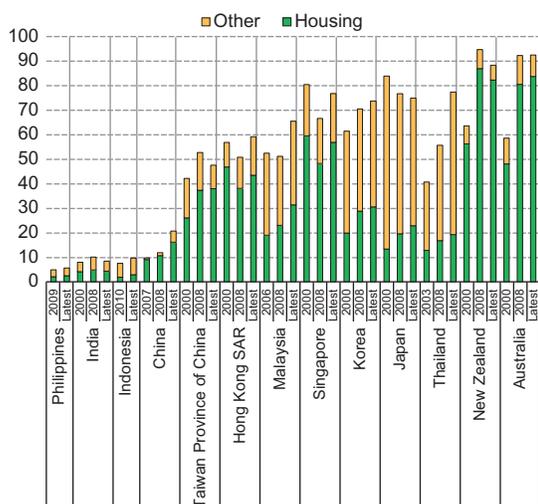
How indebted are households in Asia?

In addition to the rise in corporate leverage, rapid credit growth has also fueled growing household indebtedness across parts of Asia. This could make household balance sheets more vulnerable to slowing income growth or rising interest rates, with broader implications for consumption growth.

- *There is considerable heterogeneity in bank credit to households (as a share of GDP) across Asia.* Since 2009, this ratio has been growing particularly rapidly in Korea, Malaysia, and Thailand. Total household debt ranges from a low of 10 percent in India to nearly 100 percent in Australia and New Zealand. In China, the ratio is low (at about 20 percent) but has doubled since 2008 (Figure 2.1.1).
- *Mortgage credit accounts for a significant share of total credit to households in many Asian economies.* In the cases of Australia, New Zealand, and Hong Kong SAR mortgage lending accounts for more than two-thirds of household credit, while in Korea, Malaysia, and Singapore the corresponding figure is between one-half to two-thirds (Figure 2.1.1). Even in countries where credit to households is relatively small (such as China, India, and Indonesia) mortgage lending has been growing fast and accounts for a significant share of the total.

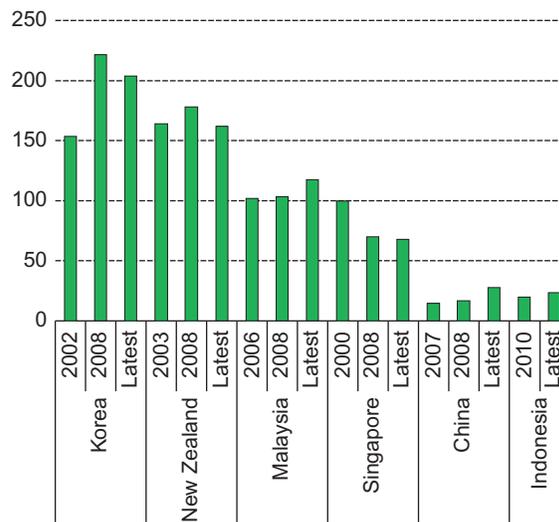
While the rapid growth in household indebtedness can create vulnerabilities, households also have significant buffers that mitigate these risks. First, household saving rates are generally high in Asia (IMF, 2011a). Second, households’ deposits and financial assets are significant and can be a short-term buffer in case liquidity shocks hit. This is the case for instance in China and Indonesia, where household debt as a ratio of their deposits remains low (Figure 2.1.2).²

Figure 2.1.1
Asia: Household Debt
(In percent of GDP)



Sources: CEIC Data Company Ltd.; Haver Analytics; World Economic Outlook database; and IMF staff calculations.

Figure 2.1.2
Asia: Household Debt
(In percent of deposits)



Sources: CEIC Data Company Ltd.; Haver Analytics; and IMF staff calculations.

¹ The main authors are Roberto Guimarães-Filho and Sidra Rehman.

² However, information about the distribution of assets and liabilities across households is generally limited, and it is unclear *a priori* that the highly indebted households are those holding large financial assets.

Box 2.1 (continued)*Are house prices overvalued?*

The potential for strains in household credit will also depend greatly on house price prospects, given the importance of housing in households' assets across Asia. Sharp price declines could rapidly weaken household balance sheets, undermine confidence and domestic demand, and have knock-on implications for lenders. House prices rose rapidly across most of Asia during the last decade (Figure 2.1.3). With the notable exception of Australia and New Zealand, the house price cycle in Asia has been somewhat asynchronous with respect to that of the U.S. and other advanced economies that experienced a bust in 2007–08. Hong Kong SAR stands out with house prices rising nearly 90 percent since 2008, followed by Malaysia and Taiwan Province of China where price appreciations have been 40 and 30 percent, respectively. The upswing has typically been much tamer elsewhere in the region, although in some cases house prices had increased considerably in the decade before 2008 (India and, to a lesser extent, Australia, New Zealand, and China).

Price-to-rent ratios have also increased in a number of economies, most notably Hong Kong SAR and Taiwan Province of China, but also Australia and New Zealand during the global boom (2003–07). In Hong Kong SAR and New Zealand rents are well above historical averages and current price-to-rent ratios are some 20–40 percent higher than historical averages, hinting at overvaluation.³ In Taiwan Province of China, Malaysia, and Australia price-to-rent ratios are also considerably above historical averages. In China and India, *aggregate* indices show relatively stable price-to-rent ratios, but in the major cities (including Shanghai and Mumbai) price increases have been well in excess of either rent or income growth. Not surprisingly, in Japan, the house price-to-rent ratio has declined over most of the sample.⁴

Econometric evidence also suggests that there are significant risks of overvaluation in a number of property markets in the region. Most price-to-rent series appear non-stationary, suggesting that prices and rents generally do not co-move one for one.⁵ Standard vector error correction models that include real, seasonally adjusted measures of prices and rents and a long-term interest rate (as an exogenous variable) are estimated to gauge the potential deviation of prices from the levels implied by rents. A long-run cointegration relationship—with a coefficient of one—is found between prices and rents for most countries.⁶ For New Zealand and Hong Kong SAR, current prices are considerably above the level suggested by the long run relationship—consistent with the deviation of price-to-rent ratios from historical averages and an indication that a future correction of house prices could be in the cards. In Hong Kong SAR's case, the assessment is corroborated by the significant “buy-rent” gaps found by existing user-cost models. Deviations in the price-to-rent ratio are also noticeable in the cases of Malaysia and Australia.

What would be the implications of a decline in house prices?

Given that rapidly rising credit has often been associated with an upward cycle in house prices, there is a potential for the housing-credit cycle to unwind in some countries. A decline in house prices would lower the value of collateral and tighten credit availability, creating an adverse financial accelerator effect. This would create a wealth effect with

³ Some challenges associated with the data on house prices and rents complicate such assessments. For example, the presence of rent subsidies can distort price-to-rent ratios. Also, the geographical coverage of real estate price indices is sometimes limited, which can be an issue if housing cycles differ within a country.

⁴ A broadly similar picture for all economies considered emerges when price-to-income ratios are used.

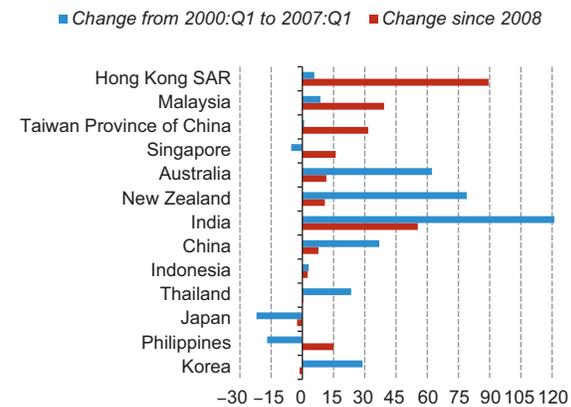
⁵ Unit root tests applied to the individual series generally fail to reject the null of a unit root in the price-to-rent series, but panel unit root tests are more favorable to stationarity.

⁶ The restriction is statistically rejected at the 5 percent level only in the Korea and Thailand models, although the deviation of prices from the estimated long run levels is robust to whether the proportionality restriction is imposed or not.

Figure 2.1.3

Housing Prices

(Percentage change, real)



Sources: CEIC Data Company Ltd.; Haver Analytics; and IMF staff calculations.

(continued)

Box 2.1 (continued)

falling housing wealth weighing on consumption (Figure 2.1.4). In addition, there is a potential for the housing correction to erode asset quality of the banking system. However, in many of the economies experiencing rapid house price inflation in recent years (e.g., Hong Kong SAR, Singapore, Malaysia, New Zealand, and Australia), banks tend to have sufficient buffers to absorb house price shocks, including strong capital positions. Therefore, house price declines are unlikely to have a major impact on bank credit.

What happened when house prices collapsed in the past? The incidence of housing “busts” in the region has been relatively small (Figure 2.1.5), taking place during the Asia financial crisis and in 2009.⁷ During these “busts,” for most countries consumption growth remained robust, suggesting that wealth effects were relatively weak or offsetting factors such as policies to stimulate household credit and consumption were at play (or both). The dynamics of house prices around these “bust episodes” has also varied considerably. In Japan, Hong Kong SAR, Korea, and Thailand, prices remained on a declining path for more than two years after the bust. In other cases, including Singapore and India, house prices bounced back rather quickly, which could have been due to policy responses, external factors (capital inflows), or domestic institutional differences.⁸

Bottom line

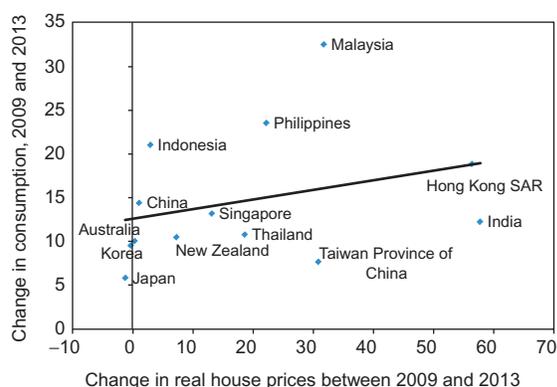
Rising household indebtedness represents an emerging vulnerability in the region, particularly where it has grown rapidly, posing risks to domestic demand. A sharp decline in house prices could be both a trigger and an amplification mechanism for these risks. Model-based estimates suggest that the likelihood of significant house price corrections is higher in Hong Kong SAR, New Zealand, and Malaysia. But large declines should not be ruled out in other economies, particularly in cities where prices have grown much faster than rents. However, based on historical episodes, the actual wealth effects (after accounting for policy reactions) associated with house price declines might be small.

Finally, while credit growth has helped fuel house prices, for much of the region, regulatory restrictions and macroprudential measures ensure that down-payments are relatively high and homeowners have significant equity buffers in their homes, mitigating the likelihood of bank losses.

⁷ Following Bordo and Jeanne (2002) a bust is identified when there is a four-quarter rolling average decline in the real house price index relative to a threshold. The latter is equal to the sample average (to account for trends) minus 1.3 times the standard deviation of year-on-year changes in the real house price index. A bust is identified in the early 1990s for Japan, during the Asian crisis for Korea, Hong Kong SAR, Singapore, and the Philippines, and during the global financial crisis for Australia and New Zealand. China has no periods classified as busts according to the methodology used here.

⁸ For example, in some jurisdictions, foreclosures and repossession of collateral happen rather quickly, which tends to accelerate the house price dynamics, especially in the event of a bust. However, in countries such as Korea, Malaysia, and Thailand, nonbank financial institutions and government-owned financial institutions play an important role in household credit (including mortgage lending) and are often subject to a different regulatory and supervisory regime than banks, creating potential sources of risk.

Figure 2.1.4

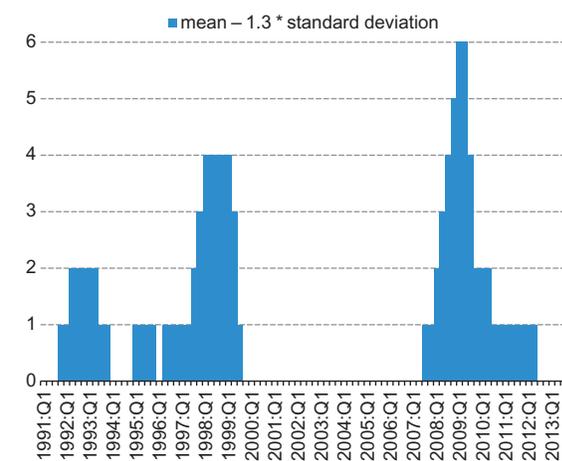
Real House Prices and Real Consumption Growth
(In percent)

Sources: CEIC Data Company Ltd.; Haver Analytics; World Economic Outlook database; and IMF staff calculations.

Figure 2.1.5

House Price Busts

(Number of countries with house price busts in progress)



Sources: CEIC Company Ltd.; Haver Analytics; and IMF staff calculations.

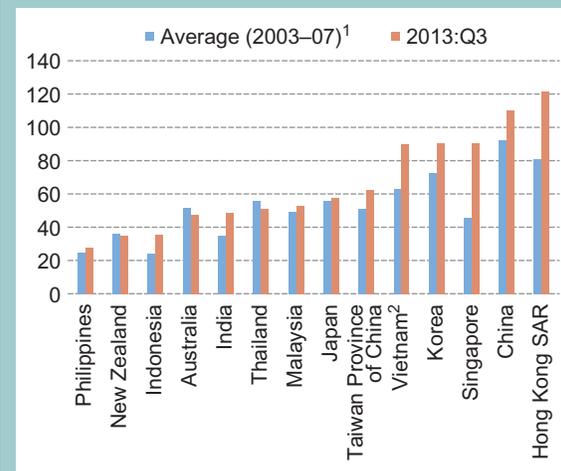
The main findings of the analysis are as follows:

- Aggregate measures of corporate leverage do not suggest that it is a near-term macroeconomic risk. The increase in leverage that has taken place in recent years is modest both relative to the excessive levels prevailing before the Asian crisis and relative to current levels in other emerging markets, particularly Latin America.
- In some countries, even though aggregate measures are not excessive, a large share of corporate debt is concentrated in only a few, highly leveraged firms. The distribution of leverage does matter and Asia clearly has “pockets” of highly leveraged firms—including in China, Japan, India, and Korea—that may pose a risk to macroeconomic stability. But an important mitigating factor is that in these countries, the debt owed by the highly leveraged firms is small relative to the overall size of the economy.¹
- The most leveraged firms are also less liquid, less profitable, and have weaker solvency indicators than other firms. This could amplify the risks to macroeconomic and financial stability. An illustrative stress test shows the potential for higher interest rates and a decline in economic growth to significantly increase the share of total debt accounted for by distressed companies, particularly in Vietnam and Indonesia.
- High leverage and weak cash flow significantly affect a firm’s ability to invest, particularly in emerging Asia. Dynamic panel estimates show that leverage has a negative effect on investment, while the impact of cash flow is positive, even after taking into account firms’ expected profitability. The effects are also generally larger for smaller firms, likely reflecting the greater credit constraints they face.

¹ Even assuming that the distribution of leverage is similar for companies *not covered in the data used here*, the total debt in the high leverage bucket is manageable (generally less than 10 percent of GDP).

Figure 2.3

Nonfinancial Corporate-Credit-to-GDP Ratio (In percent of GDP)



Sources: CEIC Data Company Ltd.; HAVER Analytics; and IMF staff calculations.

¹ Except for Singapore, which is average for 2004–07, and for China, which is average for 2007 only.

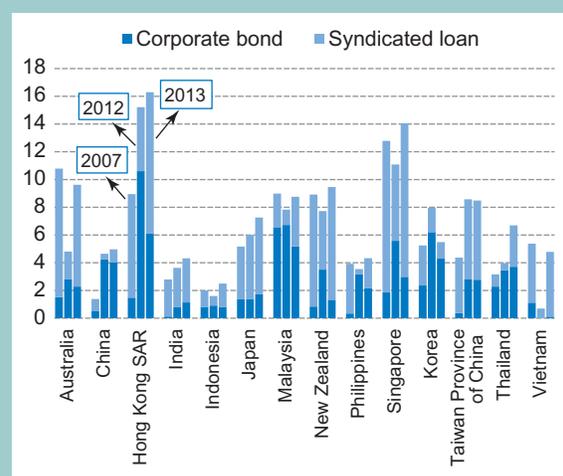
² For Vietnam graph shows private-sector-credit-to-GDP ratio.

The Facts: How Leveraged Are Asian Firms?

Bank and nonbank credit to Asian firms have risen in the past few years. The growth of bank credit to nonfinancial firms has been very strong. This has led to a rise in bank credit-to-GDP ratios in nearly all economies in the region (Figure 2.3), particularly in the financial centers of Hong Kong SAR and Singapore (which have been an increasing source of funding for firms across the region). Credit has also risen dramatically in some countries, particularly China and Vietnam.

In addition to bank-intermediated flows, corporate bond issuance has also picked up in recent years. The volume of issuance by Asian firms has surpassed the levels before global financial crisis (Figure 2.4), with particularly dramatic growth in the high yield/non-investment grade segments. This reflects both the forces of financial globalization, as larger firms have successfully issued abroad, and the low global interest rate environment, which has led to the search for yield by global investors and a compression in corporate risk premiums across the board.

Figure 2.4
Corporate Bond and Syndicated Loan Issuance
 (In percent of GDP, 2007, 2012, and 2013)



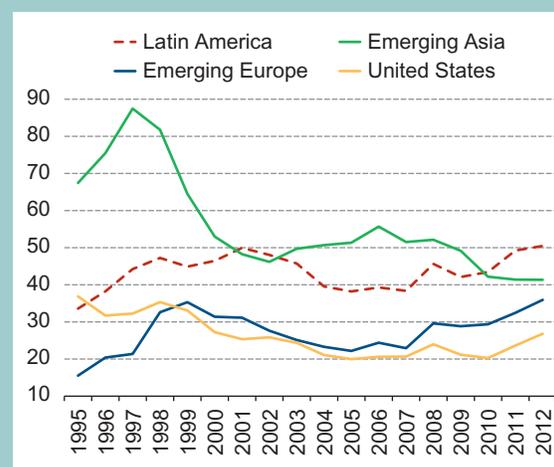
Sources: Dealogic; and IMF staff calculations.

As global interest rates start to rise, corporate vulnerabilities concealed by the easy credit environment may come to the fore. While corporate profitability has remained relatively robust in Asia, reflecting a combination of strong growth and relatively low borrowing costs, a rapid rise in corporate borrowing has increased leverage. This has raised questions about the long-term solvency of the corporate sector, particularly in economies where a significant share of corporate debt is owed by companies with relatively low liquidity and low profitability (in relation to their debt service).

Nevertheless, so far, the rise in *aggregate* leverage has been modest and does not ring alarm bells. The leverage ratio (measured by debt to common equity) has declined dramatically since the late 1990s and has only risen by less than 2 percentage points between 2010 and 2012 (for listed companies), standing at 42 percent (compared with an increase of 14 percentage points to 52 percent in Latin America during the same period, see Figure 2.5).² The regional average leverage (based on market-cap weights) has even declined in recent years. However, as seen in Figure 2.2, once aggregate leverage is computed

²The data coverage for 2013 is relatively poor and the most recent figures refer to 2012, unless otherwise noted. Also, fiscal years are used and are the same for all companies in a given country, but can differ across economies.

Figure 2.5
Debt-to-Equity Ratio
 (In percent; median)



Source: IMF, Corporate Vulnerability Utility.

using debt-owed as weights (which effectively accounts for any potential concentration of debt), there has been an increase in the key *emerging* economies in the region, particularly India and Indonesia. Meanwhile, many *advanced* Asian economies have seen a decline in average corporate leverage.

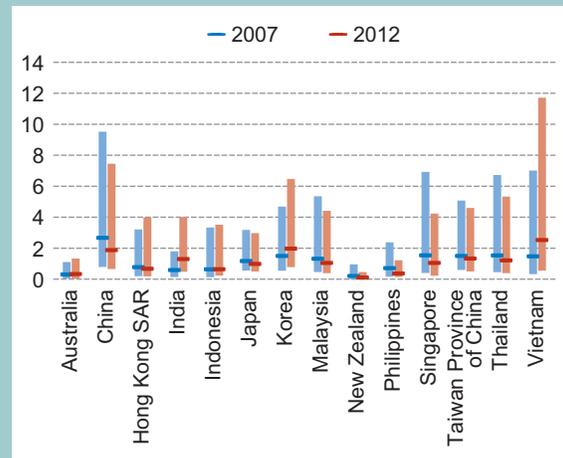
Corporate profitability has remained high, helped by continued solid economic growth. In most countries, profitability indicators (return on assets) have remained close to the levels before the global financial crisis. While profitability fell in the aftermath of the crisis—particularly in China and Indonesia—it has since recovered quickly.

The average maturity of debt has been stable (Figure 2.6). Short-term debt has increased modestly in India, Korea, and Vietnam, while declining in China, Malaysia, and Thailand. However, in all economies the dispersion of maturities is rather wide and there may be pockets of rollover and liquidity risks in the system.

However, real borrowing costs are set to continue to rise across the region.³ Over the past few years

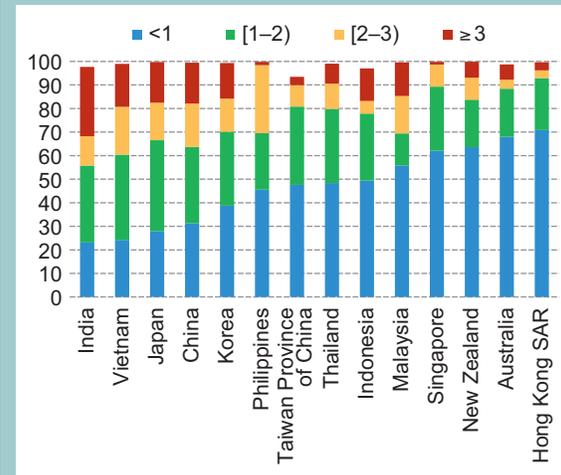
³The data are based on company-specific balance sheet information, and only has good company coverage of interest expenses up to 2012. Hence the data do not capture the rise in borrowing costs that took place after May 2013 in many economies.

Figure 2.6
Short-Term-to-Long-Term Debt Ratio Comparison¹
 (Median, 25th and 75th percentiles, 2007 and 2012)



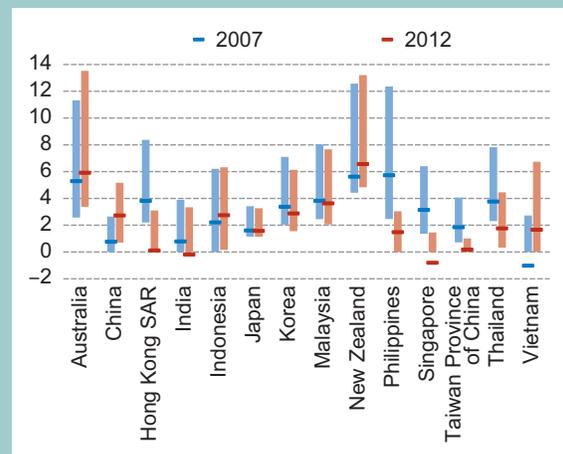
Sources: Thomson Reuters Worldscope; and IMF staff calculations.
¹ Short-term-to-long-term debt ratio is calculated as short-term debt and current portion of long-term debt/long-term debt. The lines inside the bars indicate the median.

Figure 2.8
Corporate Debt by Leverage Ratio¹
 (In percent of total corporate debt, 2012)



Sources: Thomson Reuters Worldscope; and IMF staff calculations.
¹ Leverage ratio is measured as total debt/common equity.

Figure 2.7
Real Average Interest Rate Comparison¹
 (Median, 25th and 75th percentiles, 2007 and 2012)



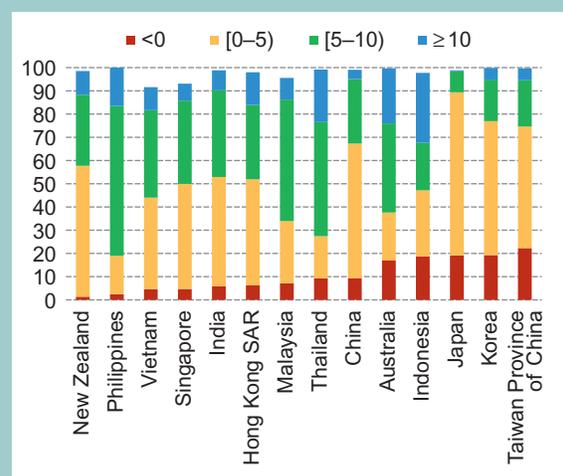
Sources: Thomson Reuters Worldscope; and IMF staff calculations.
¹ Average interest rate is measured as interest expense on debt/total debt × 100. The lines inside the bars indicate the median.

the real costs of borrowing have fallen in line with lower global interest rates (although China and Vietnam have been exceptions) and borrowing costs are now at multi-year lows (Figure 2.7). However, that situation is expected to shift going forward as global liquidity recedes and interest rates rise.

And this may place strains on parts of the corporate sector. Upon digging beneath the country averages, more disaggregated data point to a considerably large share of debt being accounted for by weaker firms. This is evident in Figure 2.8 (and Annex Figure 2.1), which shows the concentration of corporate debt for different levels of leverage.⁴ In India, for example, about a third of total corporate debt is owed by companies with high leverage (that is, with debt-to-equity ratios above 3). Similarly, the concentration of debt in highly leveraged firms is also severe in Vietnam and, to a lesser extent, in China, Japan, and Korea. In addition, the distribution of debt (by leverage) has become more concentrated in most countries over the last five years. The next section looks into the characteristics of Asia's highly indebted firms and discusses their potential to amplify future shocks to interest rates or profitability.

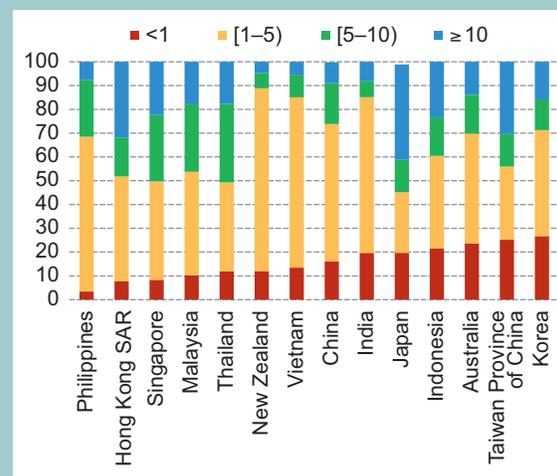
⁴The findings shown in Figure 2.8 are robust across several dimensions, for instance to whether common or total equity, gross or net debt, or debt to total assets are used. In Figure 2.8 and some of the subsequent figures, the bars do not add up to 100 percent because of the missing data on common equity.

Figure 2.9

Corporate Debt by Return on Assets*(In percent of total corporate debt, 2012)*

Sources: Thomson Reuters Worldscope; and IMF staff calculations.

Figure 2.10

Corporate Debt by Interest Coverage Ratio¹*(In percent of total corporate debt, 2012)*

Sources: Thomson Reuters Worldscope; and IMF staff calculations.

¹ Interest coverage ratio is measured by earnings before interest/total interest expense.

The Risks: What Are the Characteristics of Asia's Highly Leveraged Firms?

A careful assessment of disaggregated data suggests that the most leveraged firms in Asia tend to have lower profitability and lower interest coverage ratios, and to be less liquid. As such, the corporate sector may be more vulnerable to interest rate and profitability shocks than the aggregate data would suggest. In addition, other factors may influence how sensitive corporate default risk is to leverage. A number of firm attributes might act as mitigating factors or amplification mechanisms.⁵ Specifically:

- *Profitability.* A significant percentage of corporate debt in some countries is owed by firms that have low or negative profits (Figure 2.9). For example, in Korea and Japan, almost 20 percent of corporate debt is owed by firms with negative profits. In India and China about

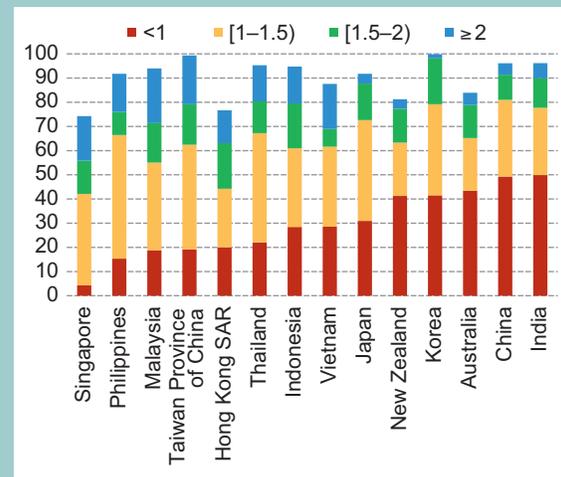
⁵ A mitigating factor in many Asian economies (notably China) is the presence of state-owned enterprises, which tend to have government guarantees—in their case, some of the risk may ultimately be fiscal.

half of the corporate debt is owed by firms with return on assets that are below 5 percent (including some owed by firms with negative profitability).⁶

- *Solvency.* Similarly, a significant share of debt is linked to companies with a low ratio of profits to interest expenses (interest coverage ratio, or ICR). For example, more than 20 percent of the debt is owed by firms with an ICR that is less than one in Australia, Korea, Japan, India, and Indonesia. These low-ICR companies also tend to have the highest leverage ratios (Figure 2.10 and Annex Figure 2.2 for selected Asian economies).
- *Liquidity.* Less liquid firms owe a significant share of corporate debt (Figure 2.11). In the case of India and China about half of corporate debt is owed by companies with current ratios below one. For Japan, Indonesia, Australia, and Korea this is the case for 30 to 40 percent of corporate debt.

⁶ In any case, comparisons based on profitability must be interpreted with caution since they are influenced by the overall nominal growth rate of the economy in question as well as its cyclical position.

Figure 2.11

Corporate Debt by Current Ratio¹*(In percent of total corporate debt, 2012)*

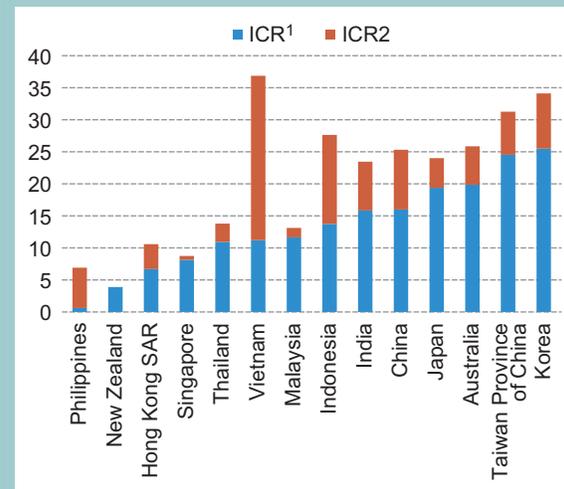
Sources: Thomson Reuters Worldscope; and IMF staff calculations.

¹ Current ratio is measured as total current assets/total current liabilities.

To further gauge the vulnerabilities associated with a prospective rise in interest rates, an illustrative “stress test” on individual firms’ balance sheets is performed. If average borrowing costs rise by 200 basis points or if profit growth falls by 20 percent, the share of debt owed by firms with an ICR less than one would clearly increase (Figure 2.12). In Indonesia and Vietnam, there would be a sharp rise in the amount of “debt at risk” (debt owed by companies with an ICR less than one), but as noted above, this debt is relatively small in relation to GDP in most countries (generally less than 10 percent with the exceptions of China and Australia). This indicates that the corporate sector is potentially more exposed to macroeconomic shocks than the aggregate data suggest and that this could act as a propagating mechanism that fuels a future downward movement in the cycle. But this is not a systemic risk since the “debt at risk” is small in relation to GDP.

A sharp exchange rate depreciation would also put pressure on corporate balance sheets. While detailed data on net foreign exchange (FX) exposures (particularly on hedging) are scant, the Spring 2014 *Global Financial Stability Report* (GFSR) considers the

Figure 2.12

Stress Test: Debt of Firms with Interest Coverage Ratio Less than One*(In percent of total corporate debt, 2012)*

Sources: Thomson Reuters Worldscope; and IMF staff calculations.

¹ ICR = interest coverage ratio. ICR is measured as earnings before interest/total interest expense. ICR2 is estimated by raising 200 basis points of interest rate.

effect of a 10 percent depreciation on the interest coverage ratio of firms. According to the 2014 GFSR stress tests, among the Asian economies considered, only India and Indonesia would face significant risks with the median ICR for the entire corporate sector falling below one.⁷ Foreign currency debt could also pose potential rollover and liquidity risks in the event of a sudden stop in gross capital inflows or a sharp increase in outflows. These risks could be significant, because the stock of outstanding foreign currency bonds has reached all-time highs across most of the region and bond issuance (Figure 2.4) has been particularly strong, even in 2013; companies issued bonds on favorable terms before the May 2013 tapering episode, and more tactically later in the year, on the expectation that global borrowing costs would rise further.

⁷ In the absence of detailed data, this exercise assumes that 50 percent of FX liabilities are unhedged. Another reason to interpret this exercise with caution is the lack of comprehensive data on the foreign currency composition of firms’ assets.

The Implications for Growth: Is Leverage a Constraint on Investment?

According to standard theoretical models of investment, the impact of leverage on investment cannot be clearly predicted beforehand. In the absence of financial frictions, leverage should have no effect on investment. In the Modigliani-Miller model, a company's financial structure and policy (in particular the composition of its liabilities) is irrelevant to its investment decisions. However, with financial imperfections (such as in the financial accelerator model of Bernanke, Gertler, and Gilchrist [1999]) a higher leverage ratio is associated with a higher risk premium, and that in turn raises external financing cost and reduces investment.⁸

To investigate the effect of leverage on investment, a firm-level panel data set that covers nearly 18,000 companies in 14 emerging and advanced Asian economies over 1995–2012 is used.⁹ The baseline model is a dynamic panel, as specified in the equation below,

$$\left(\frac{I}{K}\right)_{i,t} = \alpha_0 + \alpha_1 + \theta\left(\frac{I}{K}\right)_{i,t-1} + \beta Q_{i,t} + \gamma CF_{i,t} + \delta L_{i,t} + \varepsilon_{i,t},$$

where I/K is the investment ratio, defined as capital expenditure divided by gross fixed assets; Q stands for average Tobin's Q , defined as the sum of market capitalization and total debt divided by total assets; L stands for the leverage ratio, defined as total debt divided by common equity (book value); CF refers to cash flow, as captured in earnings before tax and appreciation, then normalized by gross fixed assets. The model includes time and firm fixed effects. To address the potential endogeneity of the leverage

⁸ In the Bernanke-Gertler-Gilchrist model, the expected return on capital (a measure of the cost of external financing) is a negative function of the ratio of net worth to the value of capital.

⁹ The data are from Thomson Reuters Worldscope and the number of firms varies significantly across countries, from 111 in New Zealand to about 3,500 in Japan. The data are at an annual frequency and are unbalanced (i.e., there are missing values for some of the firms, some of the time).

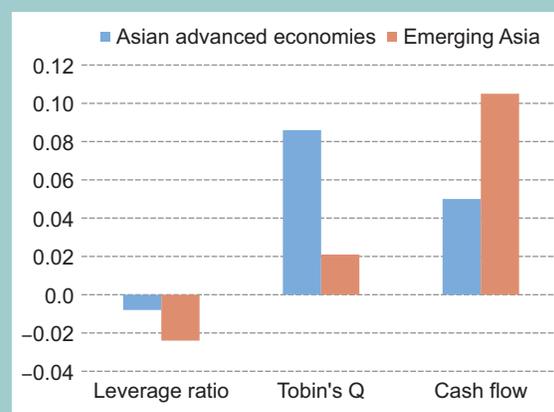
ratio, cash flow and asset price, the Arellano-Bover system-GMM estimator is applied.

The regression results show that higher corporate leverage and low cash flow have a significant negative impact on investment in Asia. This seems to suggest that highly leveraged firms generally face more difficulty in obtaining external financing which then weighs on their ability to invest. The positive effect of firms' cash flow on investment is consistent with findings from other studies (e.g., Hubbard, 1998), and also suggests that financial frictions are at play. The empirical work also shows that Tobin's Q has a positive effect on investment, indicating that firms with higher expected profitability tend to invest more.¹⁰

Both leverage and cash flows appear to have stronger effects on investment in *emerging Asia* (Figure 2.13). This may reflect greater financial

Figure 2.13

Asia: Regression Results—Asian Advanced Economies Versus Emerging Asia¹



¹ Emerging Asia includes China, India, Indonesia, Malaysia, Philippines, Thailand, and Vietnam; Asian advanced economies include Australia, Hong Kong SAR, Japan, Korea, New Zealand, Singapore, and Taiwan Province of China. Results are significant at the 95 percent confidence level.

¹⁰ Interestingly, the estimated effects of leverage and cash flow on investment are slightly larger in the period after the global financial crisis. Despite abundant liquidity, the results suggest some form of segmentation; the higher sensitivity of investment to cash flow could reflect constraints that have been more binding for a potentially large subgroup of firms.

frictions in emerging Asia and a greater reliance on internally generated earnings to finance investment (because financial systems are generally less developed and information asymmetries are larger). In contrast, in advanced economies investment decisions are more strongly related to the expected profitability of potential investments (reflected in their Tobin's Q) than to the level of leverage.

The effect of leverage on investment also depends on a firm's size and its perceived ability to repay debt. For smaller firms (defined as the bottom 10 percentile of the asset size distribution), the impact of leverage is about four times greater than it is for firms of average size (Figure 2.14).¹¹ This is not surprising, since smaller firms are more likely to face more severe information asymmetries and greater credit constraints, making their external financing premium more sensitive to the leverage ratio. Also, for firms with lower ICRs, the impact of leverage on investment is higher, since lower

ICRs indicate that the firms face a higher risk premium and greater difficulty in obtaining external financing.¹²

The Bottom Line

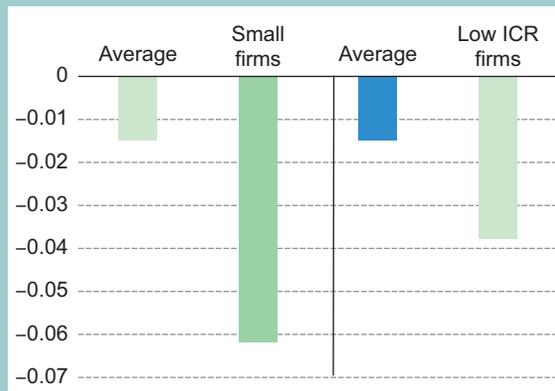
Some broad messages emerge from this analysis:

- Recently corporate leverage in *emerging* Asia has been rising, but so far it appears to be manageable as it is well below historical averages. In particular, the recent increase in leverage pales in comparison with the deleveraging that took place in the late 1990s.
- While corporate balance sheets appear healthy, a growing share of corporate debt in Asia is becoming concentrated in the weakest segments of the corporate sector. Overall risks are manageable as the “debt at risk” is small as a share of corporate debt (and GDP). But vulnerabilities are likely to be larger than aggregate data suggest. In particular, for some countries, rising real interest rates and lower growth are likely to create a significant deterioration in the underlying quality of corporate debt.
- Higher leverage has the potential to be an increasing drag on investment going forward. This is particularly true for investment by smaller firms or by companies with weaker balance sheets. If the buildup in leverage continues, it could adversely affect investment, especially in emerging Asia economies and in smaller firms across the region.

From a policy perspective, given the concentration risks associated with the rise in corporate leverage, a major priority should be enhancing financial supervision to ensure that

Figure 2.14

Regression Results: Leverage Ratios Across Different Groups of Firms¹



¹ ICR = interest coverage ratio. “Small firms” refers to firms with sizes in the bottom tenth percentile in terms of assets in the sample. “Low ICR firms” refers to firms with ICRs below 10 percent in the sample. Results are significant at the 95 percent confidence level.

¹¹ The small-firm dummy is interacted with leverage in the investment regression.

¹² In the case of unlisted firms, the effect of leverage on investment is also likely to be strong, since those firms tend to be smaller than the average listed firms, and according to some studies they are more similar to the smaller firms.

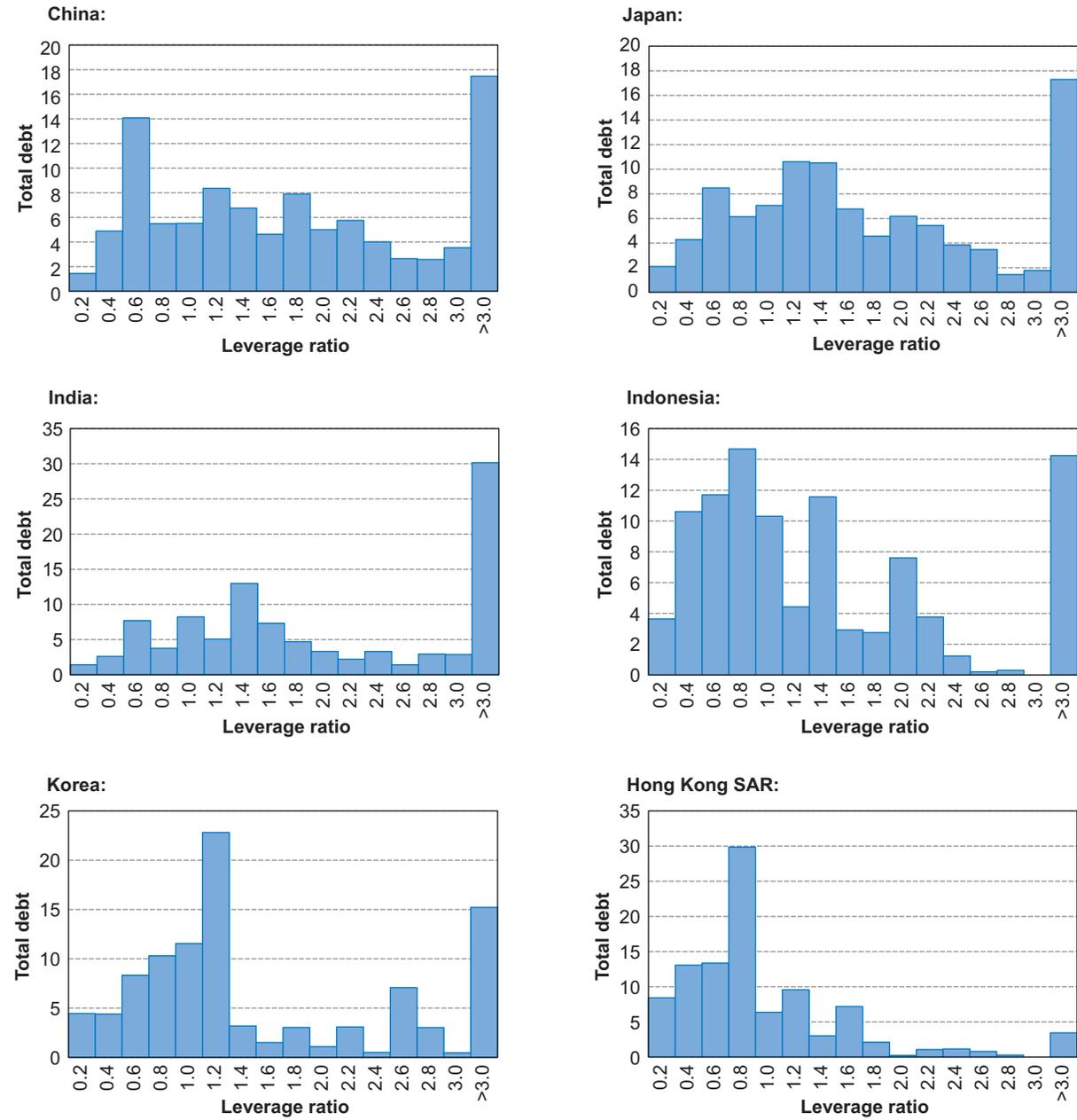
lending standards are maintained, especially in countries where credit growth has been strong or where a large share of debt is owed by relatively weak corporations. Some countries should also be prepared to handle rising corporate stress, particularly as financing costs rise alongside a normalization of global monetary and financial

conditions. But as global interest rates rise, sustaining the growth momentum will also be vital to boost the profitability of firms as well as their capacity to contract debt at less favorable terms going forward and to repay existing debt without major cutbacks in investment.

Annex Figure 2.1

Distribution of Debt by Leverage Ratio¹

(In percent of total corporate debt, 2012)



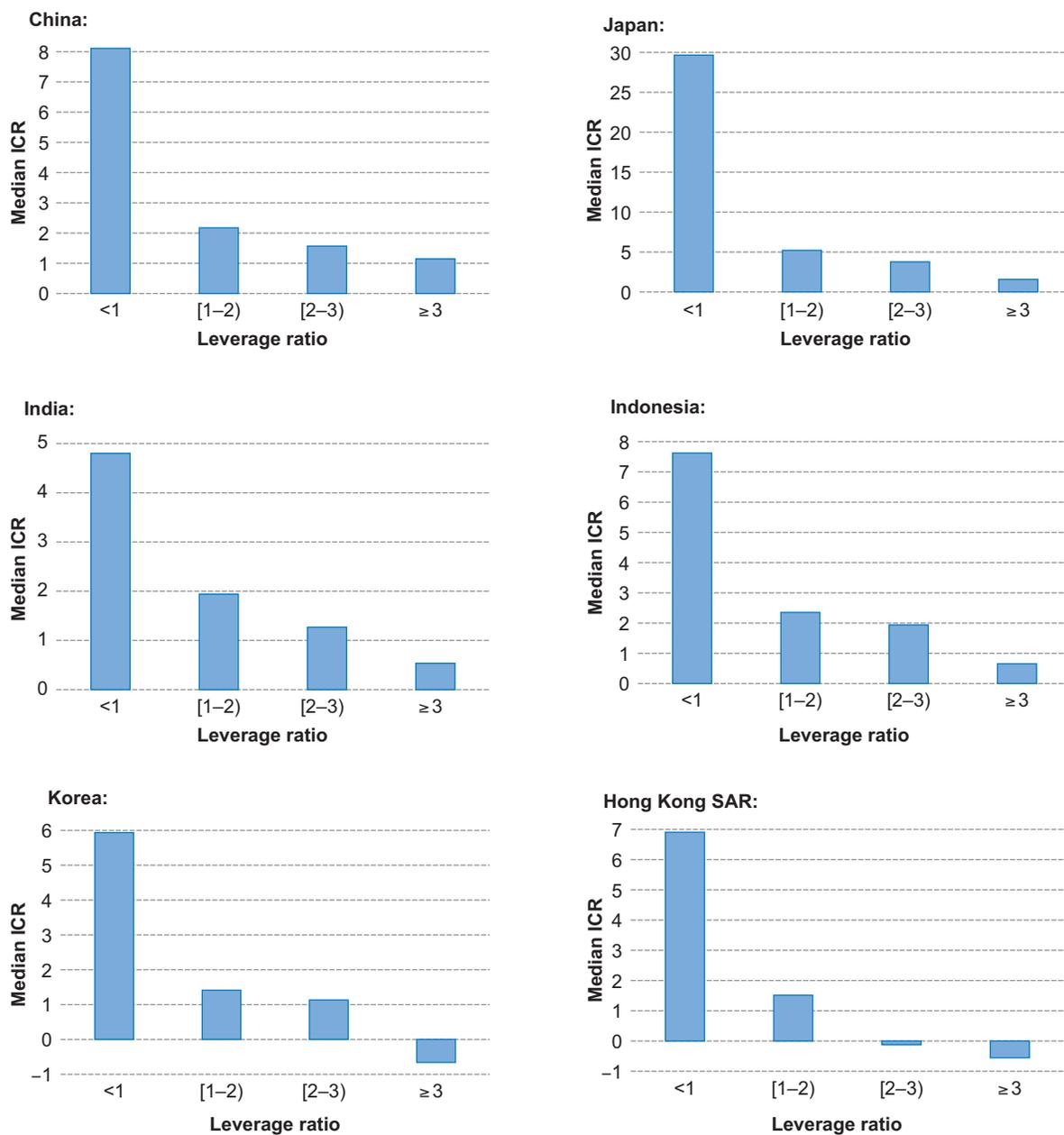
Sources: Thomson Reuters Worldscope; and IMF staff calculations.

¹ Leverage ratio is measured as total debt/common equity.

Annex Figure 2.2

Interest Coverage Ratio by Leverage Ratio Bucket¹

(Year of 2012)



Sources: Thomson Reuters Worldscope; and IMF staff calculations.

¹ ICR = interest coverage ratio. Leverage ratio is measured as total debt/common equity. ICR is measured as earnings before interest/total interest expense.