

Article

1 China's economic growth and rebalancing and the implications for the global and euro area economies

After four decades of remarkable performance, China's economic expansion has begun to slow, while the imbalances in the economy have widened. Rapid investment and rising indebtedness have created vulnerabilities in a number of sectors. Those risks have been amplified by increased complexity and leverage in the financial system. China retains policy space to cushion against potential adverse shocks, but additional rebalancing and structural reforms could facilitate a shift of China's economy onto a sustainable and strong growth trajectory in the medium term. China's size, trade openness and dominant position as a consumer of commodities mean that its transition is crucial for the global outlook. Compared with its role in global goods and commodity markets, China's integration in global financial markets is considerably lower but growing. Simulation analysis using global macro models suggests that the spillovers to the euro area would be limited in the case of a modest slowdown in China's GDP growth, but significant in the case of a sharp adjustment. However, sensitivity analysis underscores that the spillovers are dependent on the strength of the various transmission channels, as well as the policy reactions by central banks and governments.

1 Introduction

China's rise has been one of the key global economic success stories of the past four decades. Output has expanded at close to 10% per year on average since 1980. China has become the world's second-largest economy and the largest trading nation, raising living standards and reducing poverty in the process.

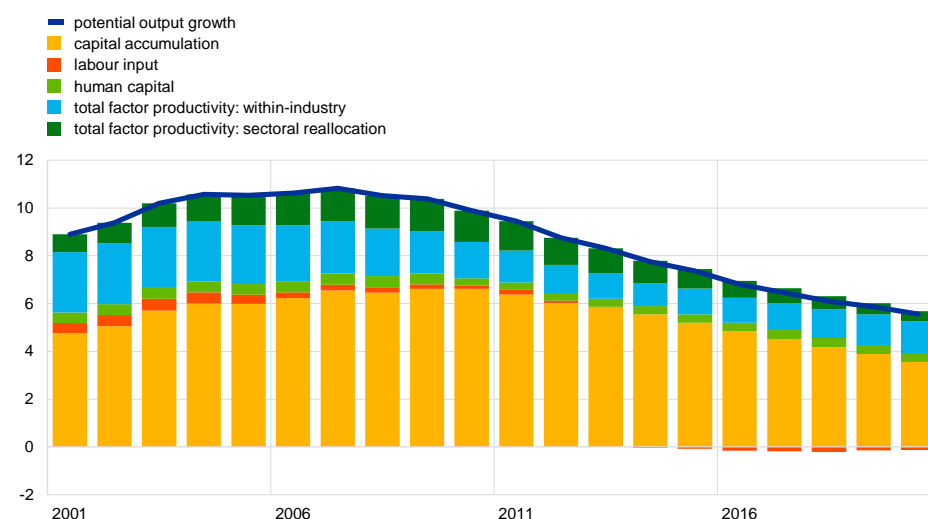
China's impressive economic performance was founded on a combination of strong productivity gains and factor accumulation. An initially low capital endowment and high returns on capital provided strong incentives for firms to invest.⁸ Sweeping reforms, such as the development of the private sector initiative in the 1980s, the reform of state-owned enterprises (SOEs) in the 1990s, and China's accession to the World Trade Organization in 2001, led to strong productivity gains. Industrialisation also benefited from an ample labour supply linked to China's fast-rising population and the absorption of workers from the countryside into modern manufacturing sectors. This combination of productivity gains and factor accumulation allowed rapid convergence and catch-up towards higher income levels.

⁸ For a discussion of high capital expenditure in China, see Bai, C.-E., Hsieh, C.-T. and Qian, Y., "The Return to Capital in China", *Brookings Papers on Economic Activity*, Vol. 37(2), 2006, pp. 61-102; Knight, J. and Ding, S., "Why Does China Invest So Much?", *Asian Economic Papers*, Vol. 9(3), 2010, pp. 87-117; and *OECD Economic Surveys: China 2013*, Organisation for Economic Co-operation and Development (OECD).

Yet China is increasingly confronting two interlinked challenges: slowing growth and rising imbalances. Having stood at over 14% in 2007, GDP growth slowed to around 7% last year. Much of the slowdown has been structural because the tailwinds that supported China’s rapid convergence are gradually diminishing. Compared with an average of around 10% during the 1990s and 2000s, the literature finds potential growth to have decreased to 7-8% in recent years (Chart 1).⁹ Falling productivity growth and diminishing returns imply that China is bumping against the limits of its traditional growth model. To secure prospects over the medium term, China needs to reform and find new sources of growth.¹⁰ However, the challenge of transitioning from middle- to high-income status is amplified by widening imbalances. In particular, China has relied heavily on investment and credit to drive growth in the past decade. Those imbalances increasingly pose risks to the outlook.

Chart 1
Potential output growth in China

(year-on-year percentage changes and percentage point contributions)



Sources: OECD, United Nations, national authorities and Penn World Tables.

Notes: Estimates of potential growth and contributions from a Cobb-Douglas production function. The contributions of sectoral reallocation to total factor productivity growth are taken from Albert, M., Jude, C. and Rebillard, C. (2015). Projections after 2016.

This article assesses the outlook for China’s economy. The next two sections discuss the current imbalances in China’s growth model and the prospects for

⁹ For a discussion of estimates of potential growth, see Alberola, E., Estrada, A. and Santabárbara, D., “Growth beyond imbalances: sustainable growth rates and output gap reassessment”, Banco de España Working Paper No 1313, 2013; Bailliu, J., Kruger, M., Toktamysov, A. and Welbourn, W., “How Fast Can China Grow? The Middle Kingdom’s Prospects to 2030”, Staff Working Paper No 16-15, Bank of Canada, 2016; Albert, M., Jude, C. and Rebillard, C., “The Long Landing Scenario: Rebalancing from Overinvestment and Excessive Credit Growth – Implications for Potential Growth in China”, Banque de France Working Paper No 572, 2015; Maliszewski, W. and Zhang, L., “China’s Growth: Can Goldilocks Outgrow Bears?”, IMF Working Paper No 15/113, International Monetary Fund (IMF), 2015; Anand, R., Cheng, K. C., Rehman, S. and Zhang, L., “Potential Growth in Emerging Asia”, IMF Working Paper No 14/02, International Monetary Fund, 2014; and *People’s Republic of China: 2014 Article IV Consultation – Staff Report*, IMF Country Report No 14/235, International Monetary Fund, 2014.

¹⁰ Zilibotti characterises this as transitioning from an extensive growth model towards innovation-led growth: see Zilibotti, F., “China at a Turning Point: The Difficult Transition from Investment-Led to Innovation-Led Growth”, keynote speech at the Chinese Economic Association Annual Conference, Duisburg, 1 September 2016.

change and reform. The fourth section analyses the implications of economic changes in China for the rest of the global economy and the euro area economy.

2 China's imbalances

Although China's unbalanced economic structure has been a subject of international policy discussion for some time, in recent years the nature of those imbalances has changed. Faced with a shortfall in external demand and slowing growth in the wake of the global financial crisis, China's government responded by boosting domestic investment. The combination of the weaker global environment and the investment surge led to a substantial correction of China's external imbalances, particularly the large current account surplus, which had peaked at close to 10% of GDP in 2007. This, however, came at the expense of an increasingly skewed domestic economic structure – specifically a heavy dependence on investment, rising indebtedness and increased risks in the financial sector.

Underlying both the previously high external imbalances and the current internal demand imbalance is China's exceptionally high saving rate. Gross national savings represented 46% of GDP in China in 2016 – one of the highest saving rates in the world.¹¹ This reflects a variety of factors including demographic trends, social policies that have limited the provision of welfare and health care, and high income and wealth inequality. Low deposit rates and capital account restrictions that weigh on investment returns for households negatively affect the saving rate. In some sectors, risk pricing and capital allocation have been skewed, allowing strong domestic investment and debt accumulation. Thus, although the patterns of China's macro imbalances have evolved, the root causes are similar.

This section discusses the recent evolution of China's imbalances and the risks they pose to the economic outlook. Section 2.1 outlines China's heavy reliance on investment and credit as drivers of growth and the vulnerabilities this has generated. Section 2.2 discusses how the rising complexity of the financial system could make the economy more susceptible to domestic crises.

2.1 Heavy reliance on investment and credit

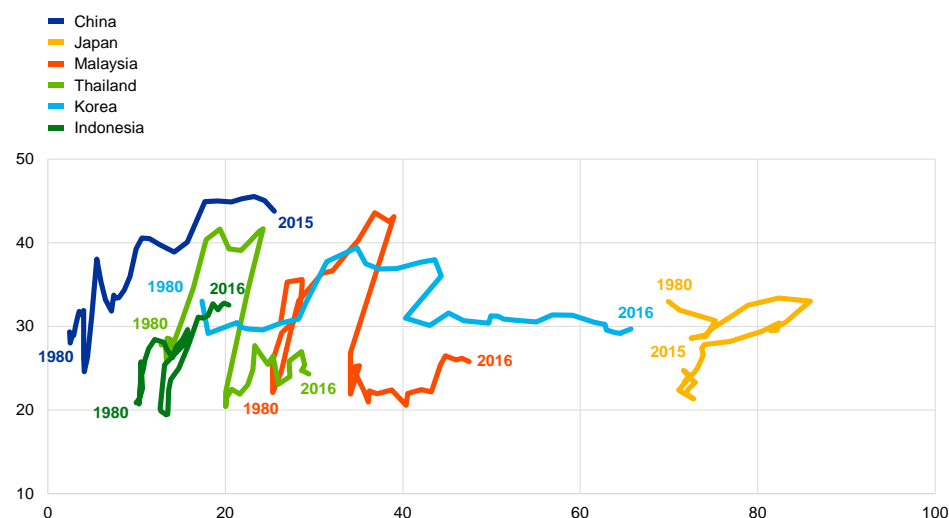
Investment has been particularly strong in China since the late 1980s. The share of investment in GDP has progressively increased from around 30% in the 1980s to over 45% on average after 2009. In some respects, high investment rates have reflected China's fast pace of economic growth and the low initial capital endowment. Yet, while a number of Asian countries have adopted similar development strategies based on rapid capital accumulation in the past, most of these countries have typically registered investment rates considerably below

¹¹ For a discussion of China's saving rate, see Ma, G. and Wang, Y., "China's high saving rate: myth and reality", BIS Working Paper No 312, June 2010; and *People's Republic of China: Staff Report for the 2017 Article IV Consultation: Selected Issues*, International Monetary Fund, 2017.

China's current share (Chart 2). More recently, there has been a gradual, albeit slow, rebalancing from investment towards consumption. The investment-to-GDP ratio has fallen from the peak in 2011. Yet, it remains high by international standards. Moreover, the capital stock-to-output ratio has continued to rise and this rise has been accompanied by a declining marginal return on capital and a diminishing impulse from investment to economic growth.

Chart 2
Investment relative to stage of development

(y-axis: real investment, as a percentage of GDP; x-axis: GDP per capita at purchasing power parity (PPP), US dollars)



Sources: IMF World Economic Outlook and World Bank.
Notes: For each country, GDP per capita is relative to US GDP at each respective point in time.

High investment rates have also been accompanied by a sharp increase in indebtedness. The surge in credit began in 2009 as the authorities sought to sustain high investment in the face of falling corporate profits and savings. Corporate debt accounts for the bulk of the increase. Although household debt remains more modest, lending to households, particularly mortgage lending, has risen sharply in the past two years. More recently, credit growth has slowed but it still outpaces nominal GDP growth.

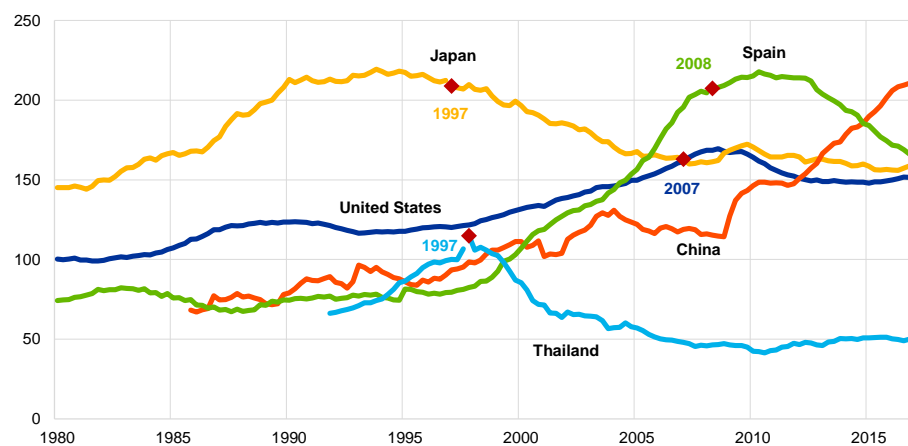
Both the level and the rate of growth of debt are exceptional for a country at China's stage of development. China's private non-financial sector debt to GDP, now at 211%, is high relative to other emerging market economies (EMEs) and comparable to levels in many advanced economies. Rapid credit growth has often been a precursor to a financial crisis (Chart 3). Even in countries that have avoided full-blown crisis, post-boom growth tends to suffer from a marked step-down after the end of a credit boom.¹²

¹² See Beck, R., Georgiadis, G. and Straub, R., "The finance and growth nexus revisited", *Economics Letters*, Vol. 124(3), 2014, pp. 382-385, which discusses the argument that beyond a certain threshold of aggregate indebtedness the growth effects of further financial intermediation can fall or even become negative.

Chart 3

Credit-to-GDP ratios in selected countries

(as a percentage of GDP)



Source: Bank for International Settlements.

Notes: Credit to private non-financial sectors at market value as a percentage of GDP. The red diamonds indicate years of crises according to Laeven, L. and Valencia, F., "Systemic Banking Crises Database: An Update", IMF Working Paper No 12/163, 2013.

Rapid investment and increasing indebtedness have created vulnerabilities in a number of sectors in China. The risks extend across the corporate sector, SOEs, local governments and the real estate market.

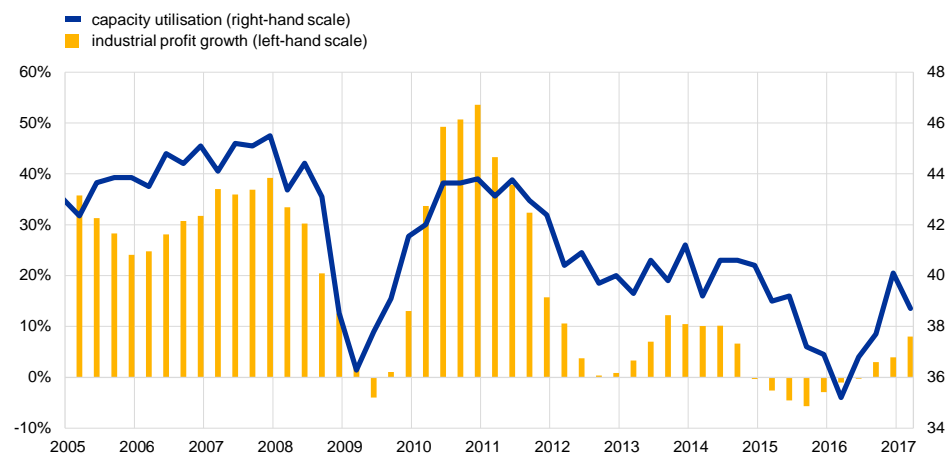
In the corporate sector, rising leverage and expanding capacity have weakened balance sheets and profitability. Since the global financial crisis, capacity has expanded rapidly in several industries and well ahead of market demand. Despite the modest rebound in recent months, surveys suggest that capacity utilisation rates across industries remain below pre-crisis levels (Chart 4). Excess capacity has been particularly problematic in some heavy industries such as steel, aluminium, cement, flat glass and shipbuilding.¹³ Excess capacity has affected corporate profitability. Growth in profits in the industrial sector has been weak in recent years. Analysis of firm-level data suggests there is a significant share of listed firms for which profits are insufficient to cover interest payments (Chart 5).

¹³ See *Overcapacity in China: An Impediment to the Party's Reform Agenda*, European Union Chamber of Commerce in China, 2016.

Chart 4

Industrial capacity utilisation and profit growth

(left-hand scale: percentages; right-hand scale: diffusion index)

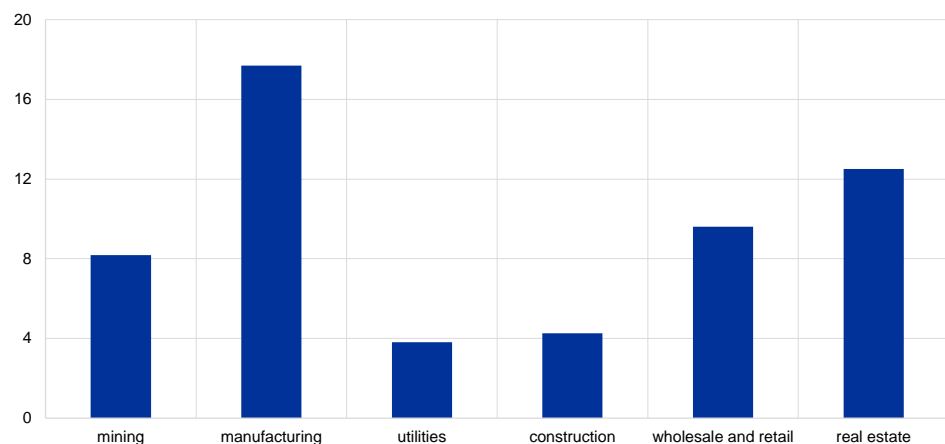


Sources: CEIC and ECB staff calculations.

Chart 5

Shares of debt at risk by industry

(percentage of listed firms in each sector with an interest coverage ratio below 1)



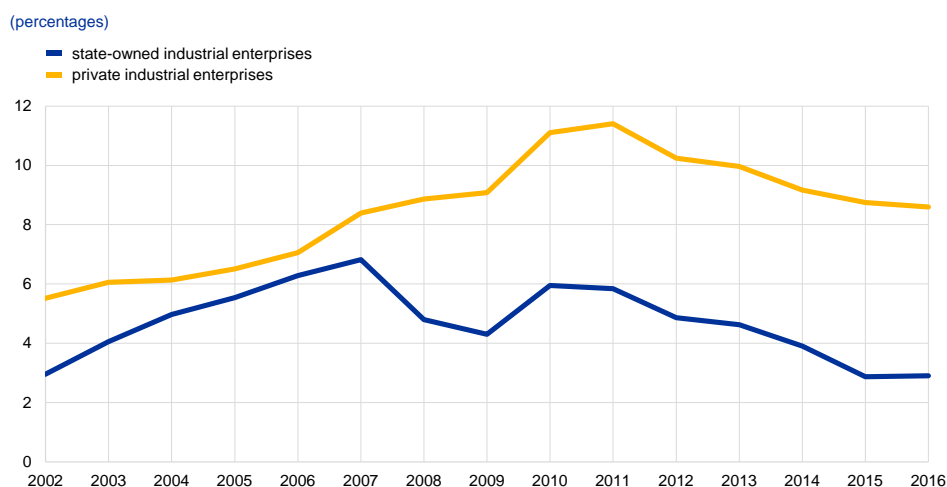
Sources: Wind Economic Database and ECB staff calculations.

Notes: Figures taken for individual listed firms using data from June 2016. Interest coverage ratio refers to the ratio of earnings before interest and taxes (EBIT) over interest expense, as calculated in the Wind Economic Database.

Vulnerabilities in the corporate sector have been driven particularly by state-owned enterprises. With preferential access to credit and implicit state guarantees, SOEs have been a primary driver of the increase in leverage and investment in recent years. In the wake of the global financial crisis, high investment by SOEs acted as a significant countercyclical force against falling global demand.¹⁴ However, the consequence has been declining profitability, with the return on assets of SOEs in the industrial sector falling well below that of private sector counterparts (Chart 6).

¹⁴ See Wen, Y. and Wu, J., "Withstanding great recession like China", Federal Reserve Bank of St. Louis Working Paper No 2014-007A, 2014.

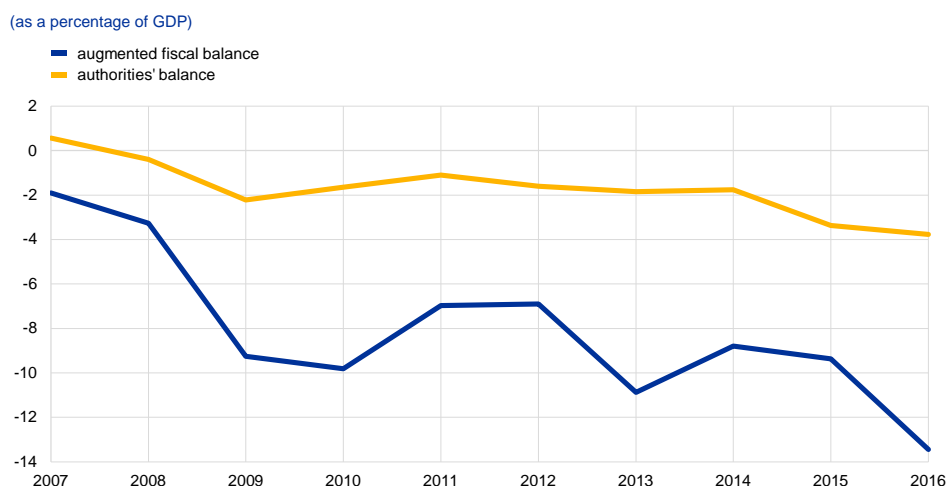
Chart 6
Return on assets



Sources: CEIC and ECB staff calculations.

The state sector has also played an important role through rapid infrastructure expansion by local governments. A sizeable part of the investment since the global financial crisis has been infrastructure investment mostly by local governments, which are forbidden from running budget deficits. In order to meet ambitious growth targets, they resorted to land sales and off-balance-sheet funding through local government financing vehicles, which borrowed through bond issues and bank loans. Factoring such finance into calculations of an “augmented deficit” suggests that in recent years the stimulus provided by government has been significantly larger than that shown by official deficit figures (Chart 7).

Chart 7
Fiscal balance



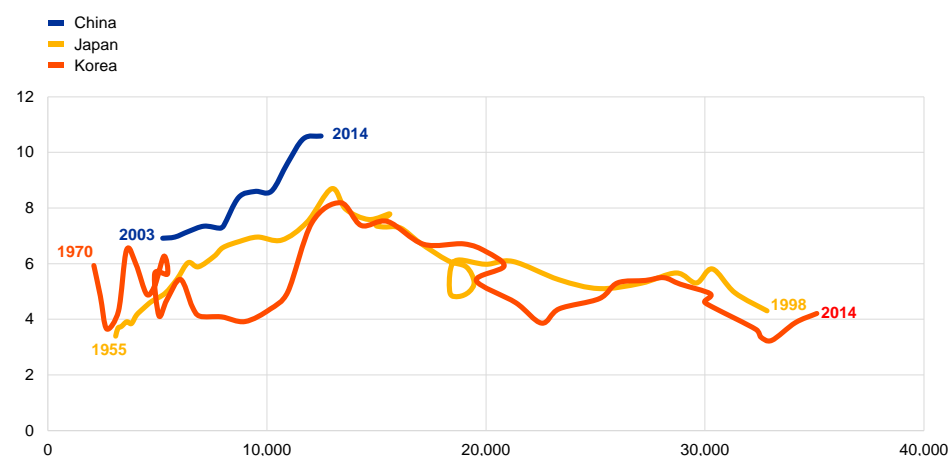
Sources: CEIC, Wind Economic Database and ECB staff estimates.

Notes: The augmented fiscal balance is the general government balance, plus estimated local government spending financed by land sales, local government borrowing and off-balance-sheet borrowing (through local government financing vehicles). The definition of the augmented deficit is close to that in *People's Republic of China: Staff Report for the 2017 Article IV Consultation*, International Monetary Fund, 2017.

Risks have also increased in the real estate sector. Real estate investment has been one of the main drivers of China's rapid investment growth in recent years (Chart 8). A number of factors have supported strong housing demand, including the process of urbanisation and the need to upgrade dwellings. Solid household income growth, high saving rates and limited alternative investment options have also made real estate an attractive asset for households in comparison to bank deposits and the stock market. Yet there are signs of possible imbalances. China's real estate boom has been accompanied by rapid property price increases. In real terms, estimates of a quality-adjusted price index for residential property in 35 major Chinese cities increased by 10% per year between 2006 and 2014.¹⁵ By contrast, in smaller cities, despite some improvement over the past year, oversupply in the real estate market remains a concern, with still sizeable unsold inventories held by developers. Given China's heavy reliance on real estate, a downturn in the real estate market could significantly impair its broader economy.

Chart 8
Residential investment

(y-axis: residential investment as a percentage of GDP; x-axis: GDP per capita based on PPP)



Sources: Penn World Tables and national sources.

Note: The estimates for residential investment are based on the value of all new residential buildings according to China's construction statistics. See "The potential effects of a downturn in the Chinese housing market on the real economy", *Monthly Report*, Deutsche Bundesbank, August 2014, pp. 17-19.

2.2 Rising leverage and complexity in the financial sector

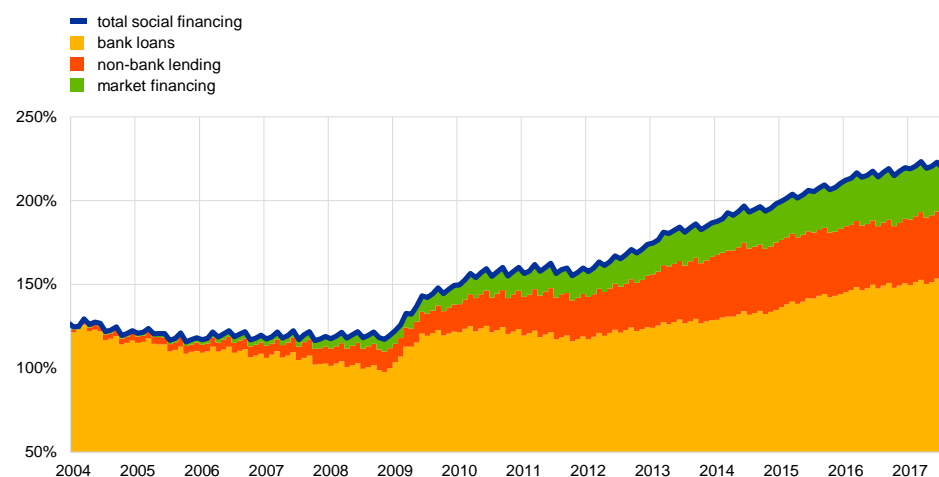
The risks associated with fast-rising indebtedness have been amplified by increased complexity in the financial system. Banks remain the primary source of credit in China and their assets have grown substantially since the global financial crisis. At the same time, non-bank or "shadow banking" activities have also increased, with credit from non-bank sources to the non-financial sector rising to around 70% of GDP by 2016 (Chart 9).

¹⁵ See Wu, J., Gyourko, J. and Deng, Y., "Evaluating the Risk of Chinese Housing Markets: What We Know and What We Need to Know", *China Economic Review*, Vol. 39(7), 2016, pp. 91-114.

Chart 9

Total social financing

(as a percentage of GDP)



Sources: CEIC and ECB staff calculations.

Notes: Total social financing is a measure used by the People's Bank of China of the aggregate provision of financing to the economy. Total social financing also includes equity financing.

Increased non-bank financing has widened the sources of credit for firms but has given rise to new risks. Non-bank forms of finance can have advantages if they provide firms and households with alternative sources of funding and promote financial inclusion. In China's case, new channels of non-bank financing have been one means of enabling financial liberalisation. However, such activity has increasingly reflected regulatory arbitrage, with institutions aiming to minimise regulatory oversight and reduce (or avoid) the impact of capital, provisioning and liquidity requirements.

The risks associated with shadow banking extend across the financial system.

Banks are exposed to shadow banking products through outright and implicit guarantees. Banks own and operate many of the non-bank structures and are potentially liable for losses on shadow banking investment products they have marketed. For example, although banks do not have direct liability for so-called wealth management products (WMPs), implicit guarantees suggest they may feel obliged to compensate investors in the event of default. Greater interconnectedness between the shadow banking and banking sectors is also reflected in the rapid expansion of borrowing in the money market, as large banks have lent to smaller banks and other financial institutions such as securities firms, trust companies and asset management companies. Finally, banks have increasingly used shadow structures to shift traditional lending activity out of their banking book. These so-called "shadow loans" comprise a claim on products structured by trust or securities companies, packaging together loans or bonds. Banks classify such exposures as a claim on a financial institution which lowers the capital charge and provisioning requirement.

Rapid credit expansion could imply heightened risks for the banking system.

However, on aggregate, banks' core Tier 1 capital adequacy ratio is well above the regulatory minimum. Provision coverage ratios are high, albeit declining, and

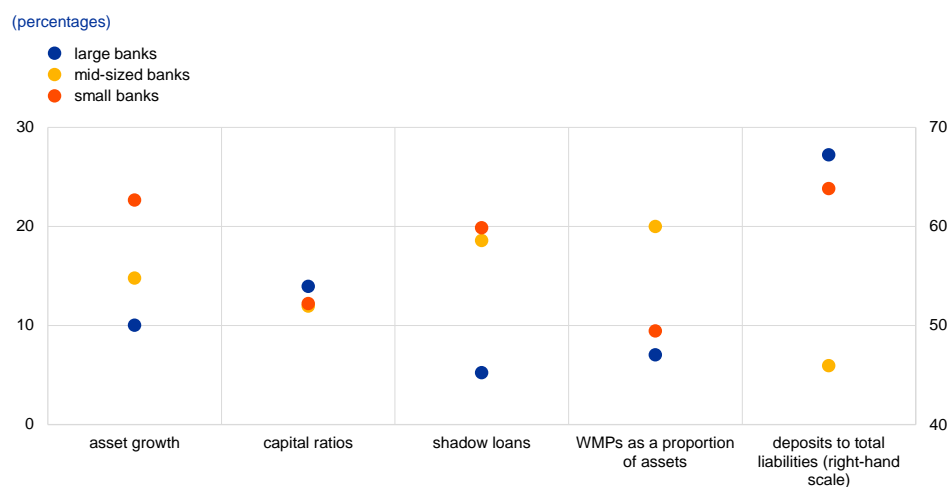
reported non-performing loans for the aggregate banking sector are very low at around 1.7% of total lending in 2016. Yet, analysis of firm- and bank-level data suggests that estimates of the debt at risk – i.e. the proportion of firms with low interest coverage ratios – could be higher.¹⁶

Shifts in saving behaviour have also increased funding, liquidity and counterparty risks for banks, particularly smaller institutions. The low deposit rate environment and the proliferation of alternative saving products, such as WMPs, have encouraged greater mobility of savers who are increasingly seeking higher returns. However, the situation differs across banks. With strong expectations of implicit state support, the five largest banks continue to receive the bulk of retail deposits. By contrast, with a much lower expectation of state support, smaller banks are suffering more from the shift in saving behaviour and have become increasingly dependent on wholesale funding to fund rapid asset growth. And they have increasingly relied on central bank liquidity provision: bank borrowing from the People's Bank of China has doubled in the past two years, reaching 16% of GDP by the end of 2016. The squeeze on funding has affected net interest margins and the profitability of small banks.

Overall, therefore, while the banking sector appears healthy in aggregate, there are large variations across institutions. The five largest banks continue to attract deposits and are net lenders in the interbank market. They have expanded less aggressively, have accumulated fewer shadow loans and have minimal off-balance-sheet exposures, which means reported regulatory ratios are much more representative of their liquidity and capital needs. Risks are significantly higher outside the big-five banks. Mid-sized and smaller banks bear a disproportionate share of the credit and funding risks, with larger shadow loan portfolios and off-balance-sheet WMP exposures, weaker profitability and a greater reliance on wholesale funding (Chart 10).

¹⁶ Estimates for listed firms in the Wind Economic Database as at June 2015 suggest that around 8% of on-balance-sheet lending could be classified as "at risk". Debt at risk is calculated as the proportion of the debt of listed firms with an interest coverage ratio below one.

Chart 10
Banks' funding and loan exposures



Sources: CEIC, UBS and ECB staff calculations.
Notes: Asset growth is the average for the period 2014-16. The capital ratios include Tier 1 and Tier 2 capital. Shadow loans are represented by the share of claims on other financial institutions in total assets. WMPs as a share of assets are computed from UBS data for 23 listed banks as at end-2015. Capital ratios, shadow loans and deposits to total liabilities are shown as at end-2016. Bank definitions according to the CEIC classification.

3 The prospects for transition and reform

Although vulnerabilities have grown, China retains policy space to cushion against potential adverse shocks. China has high national savings, large foreign exchange reserves and a current account surplus, which help to shield it against an external funding crisis. An estimate of augmented general government debt, which accounts for contingent liabilities and off-balance-sheet local government borrowing, has risen in the past five years but, at around 60% of GDP, affords some space to react to emerging shocks.¹⁷ Moreover, despite slowing growth, the interest rate-growth differential remains favourable. The government also has significant public assets including the stock of foreign exchange reserves (despite the declines in the past two years). Importantly, the government also retains levers to manage the economy, particularly through its close links with SOEs and banks.

However, additional rebalancing and reform could help to move China onto a more sustainable growth trajectory in the medium term. In the past, short-term stimulus to bolster economic activity in the face of slowing structural growth and widening imbalances has helped to stabilise growth. However, continued reliance on such measures could eventually deplete policy buffers. An adjustment to the structure of production and demand, including less reliance on investment and credit-driven growth, could support the transition towards a more balanced growth path.

¹⁷ For a discussion of calculating augmented government debt for China, see *People's Republic of China: Staff Report for the 2017 Article IV Consultation*, International Monetary Fund, 2017.

The Third Plenum of the Chinese Communist Party in 2013 mapped out a reform agenda. It emphasised tackling imbalances and allowing markets to play a greater role in allocating resources. Since then, and especially in 2016 when China chaired the G20, liberalisation of the financial system has continued. In recent months, the government has placed increased emphasis on tackling financial stability risks, with regulatory measures to increase scrutiny and recognition of risks in the shadow banking sectors. Administrative reforms are improving the business environment. Fiscal measures are also starting to put local government finances on a more even keel. Steps towards reforming the role of SOEs in the economy are proceeding more slowly, although the government has initiated reforms to address governance issues. The measured approach towards economic reforms in part reflects that reforms can entail a trade-off between greater variability in short-term growth and achieving medium-term stability. The reduction and loosening of annual targets for GDP growth partly acknowledge this trade-off. The recent 19th National Congress of the Communist Party provided the government with a chance to renew reform momentum.

Experience in adjusting the exchange rate regime during 2015 provides one illustration of the challenges associated with reform. From mid-2014 the appreciation of the US dollar and increased market concerns about China's economic outlook prompted a change in expectations about the renminbi exchange rate. Significant net capital outflows from China followed as corporates repaid dollar liabilities and households sought to diversify asset portfolios. At the same time, the authorities aimed to adjust the exchange rate regime, moving from a de facto US dollar-based peg towards an exchange rate managed against a basket of other currencies. The move prompted significant financial market volatility amid an acceleration of capital outflows and sharply falling foreign exchange reserves. The situation was stabilised by a combination of improved communication by the People's Bank of China, tighter capital controls and measures to support the growth outlook which helped shift expectations. However, the episode emphasised that greater financial openness can entail more financial market instability and must be accompanied by exchange rate flexibility to ensure monetary policy autonomy. Such complex trade-offs between short-term stability and progress in reaching medium-term goals could also be encountered in other areas of reform.

4 The implications of China's transition for the global and euro area economies

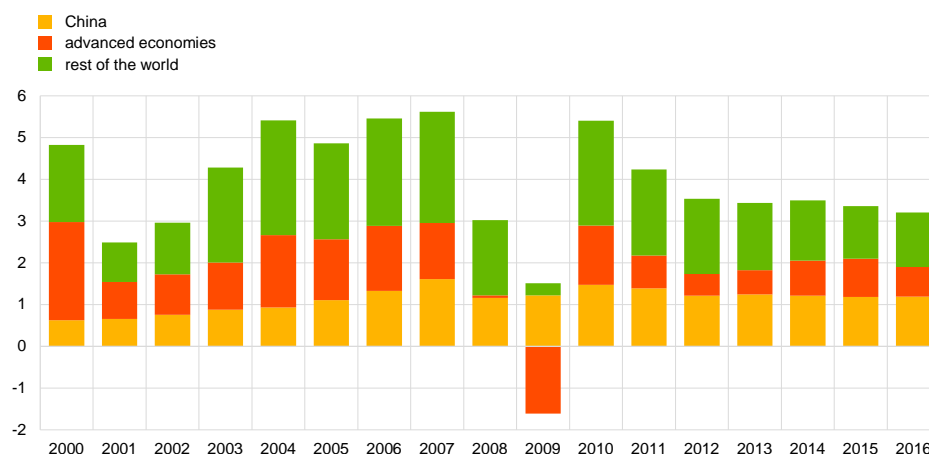
4.1 China's links with the rest of the world and the euro area

China's size, trade openness and dominant position as a consumer of commodities mean that its transition is crucial for the global outlook. China has contributed on average one-third of total global growth since 2005 – more than the combined contribution of advanced economies (Chart 11). China accounts for around 10% of global imports and while that partly reflects China's important position

in global value chains, for many trade partners a significant proportion of value added depends on final demand in China. China is one of the world's largest consumers and producers of many commodities, accounting for over half of global copper, aluminium and iron ore consumption, and a high proportion of global energy consumption.

Chart 11
Contributions to global GDP growth

(percentage point contributions to global GDP based on PPP weights)



Source: International Monetary Fund.

Compared with its role in global goods and commodity markets, China's integration in global financial markets is considerably lower, but experience in recent years has shown that shocks emanating from China can affect global financial markets. Together, China and Hong Kong accounted for 8% of global gross asset and liability positions in 2015, although the composition of China's external position, with assets dominated by reserves and liabilities skewed towards foreign direct investment, may limit the potential for financial spillovers through balance sheet and valuation channels. But the events of the summer of 2015, when equity market and currency volatility prompted a bout of global risk aversion, have shown that, despite limited direct financial sector exposures, shocks emanating from China can affect global financial markets through the confidence channel. Looking ahead, given the authorities' emphasis on greater financial openness, financial channels are likely to become more important.¹⁸

China's direct links to the euro area are more limited. Around 7% of extra-euro area exports go to China.¹⁹ Direct financial links are smaller: China and Hong Kong account for 2.7% of extra-euro area banking claims and around 1% of euro area banking claims when intra-euro area claims are included (Chart 12).

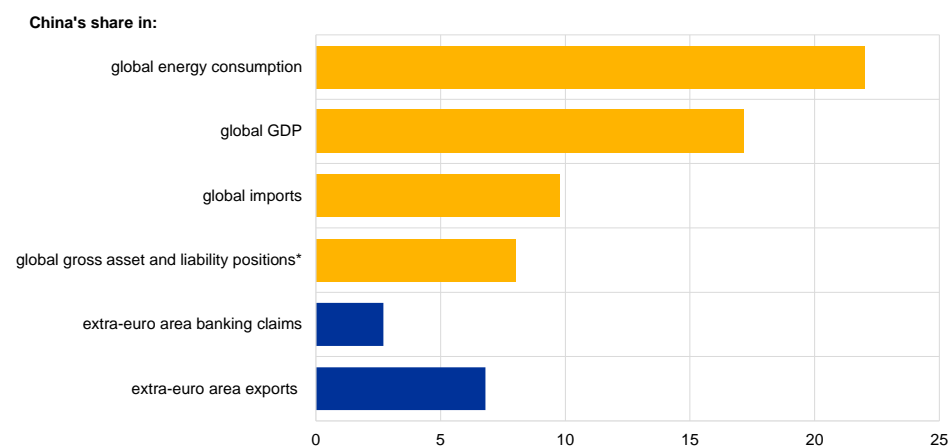
¹⁸ See the box entitled "Understanding the links between China and the euro area" in *Financial Stability Review*, ECB, November 2015. See also the box entitled "Is euro area financial stress becoming more global?" in *Financial Stability Review*, ECB, November 2016.

¹⁹ Given the rapid increase in China's imports in the past decade, China has contributed about 12% of the growth in euro area foreign demand since 2005.

Chart 12

China's global role and euro area links

(yellow bars: percentage of global totals; blue bars: percentage of euro area totals)



Sources: International Monetary Fund and International Energy Agency.

Notes: Figures for 2015. GDP based on PPP; imports based on market exchange rates. Energy consumption as a share of world total primary energy supply. Euro area banking claims as a percentage of extra-euro area claims. *Includes Hong Kong.

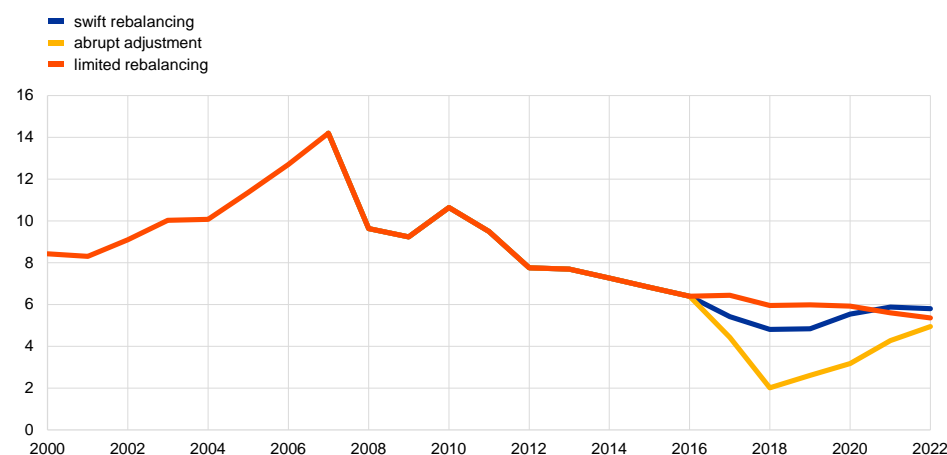
4.2 The spillovers from China's transition to the global and euro area economies

To illustrate the possible adjustment paths for the Chinese economy, this section sketches three stylised scenarios (Chart 13). A “limited rebalancing” scenario envisages China undergoing a gradual slowdown with some modest steps towards rebalancing the economy. In the near term, this would imply that the economy remains skewed towards investment and credit-driven expansion, suggesting that some vulnerabilities and downside risks would remain. A “swift rebalancing” scenario envisages a more aggressive reform effort to address existing fragilities. Lower investment and credit creation imply weaker growth in the short term. However, over time reforms would support household consumption and improve the efficiency of the economy, securing a more sustainable medium-term growth path. An “abrupt adjustment” scenario foresees a sharper downturn as downside risks materialise. One trigger for such a downturn could be adjustment in the financial sector amid tightening financial conditions. Given that China retains policy space to cushion the economy against shocks, a sharp slowdown in the near term is considered a low probability event.

Chart 13

Illustrative scenarios for China's growth outlook

(annual percentage changes in GDP)



Sources: CEIC and ECB staff calculations.

To understand the impact of a transition in China, global macroeconomic models are used to study its spillovers to the global economy.

The “limited rebalancing” scenario is treated as the baseline. This is first compared with the “swift rebalancing” scenario, which envisages an aggressive reform effort to address existing fragilities and implies an additional slowdown in GDP of cumulatively about 3% in China over three years (Chart 13).²⁰ Secondly, the implications of the “abrupt adjustment” scenario triggered by a sharp financial tightening are studied; here, China’s real GDP would be around 9% lower after three years. To draw out the importance of different spillover channels, the simulations start with some key assumptions that are subsequently relaxed. In particular, it is initially assumed that: (a) trade and financial linkages are in line with past averages; (b) oil markets react endogenously; (c) the spillovers from China’s financial markets to the rest of the world are limited; and (d) monetary policy in China is constrained, with the authorities following a managed exchange rate regime.²¹ The simulations are carried out using the ECB-Global model and are cross-checked with a range of structural and non-structural global models including the IMF’s global model (GIMF), the Oxford Economics global model (Oxford) and, for the euro area, the ECB’s New Multi-Country Model (NMCM)²². The models have varying levels of detail and country coverage.

²⁰ This is simulated via a negative domestic demand shock, driven primarily by slower investment, and an endogenous tightening of credit and bank lending conditions.

²¹ A further key assumption is that monetary policies are unconstrained outside China. In addition, the simulations assume there is no fiscal stimulus beyond the functioning of automatic fiscal stabilisers. The scenarios do not include possible effects from shifts in global uncertainty or confidence effects, or contagion to other EMEs.

²² See Dieppe, A., Georgiadis, G., Ricci, M., Van Robays, I. and van Roye, B., “ECB-Global: Introducing the ECB’s Global Macroeconomic Model for Spillover Analysis”, *Working Paper Series*, No 2045, ECB, 2017; Kumhof, M., Laxton, D., Mursula, S. and Muir, D., “The Global Integrated Monetary and Fiscal Model (GIMF) – Theoretical Structure”, IMF Working Paper No 10/34, International Monetary Fund, 2010; and Dieppe, A., Gonzalez Pandiella, A. and Willman, A., “The ECB’s New Multi-Country Model for the euro area: NMCM – Simulated with rational expectations”, *Working Paper Series*, No 1315, ECB, 2011.

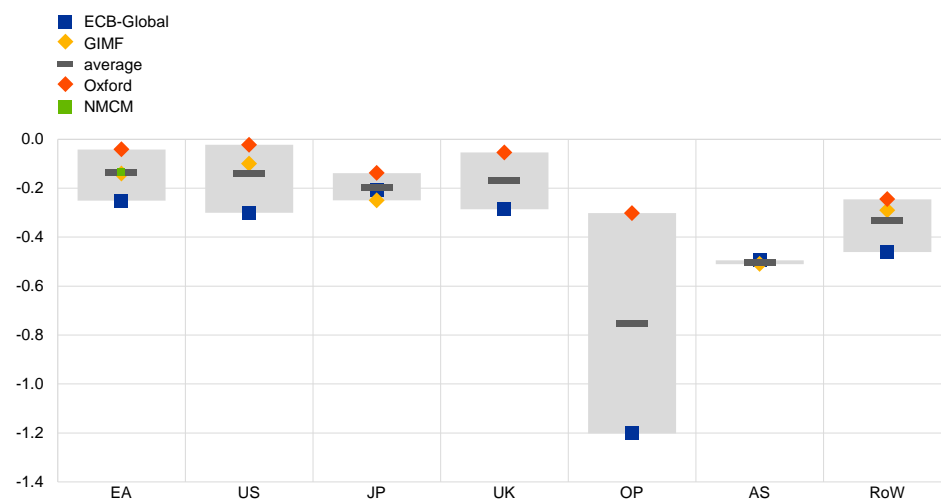
Under these assumptions, the near-term model implication of the “swift rebalancing” scenario is that global activity would be depressed, although the effects are relatively limited, except for oil producers. The rebalancing of growth in China, with (import-intensive) investment growth falling, entails a marked decline in global trade growth, which dampens export demand for China’s main trading partners. Countries with closer trade linkages are more affected by negative shocks from China. Oil producers’ output is also affected strongly by adverse terms-of-trade adjustments arising from the decline in oil prices due to weaker global demand. However, for commodity-importing economies, the decline in commodity prices helps to cushion demand together with looser monetary policy. In ECB-Global, which encompasses financial channels, the cross-border effects are to a limited degree also amplified by financial markets: the rise in China’s interbank spreads and the fall in equity prices weigh on global equity prices and cause an increase in global interbank spreads and risk premia. By contrast, in GIMF, Oxford and NMCM there is only limited modelling of the financial side of the economy which implies less pronounced global spillovers than in ECB-Global. Yet, despite these differences, the results from the range of models are broadly similar, suggesting that output in advanced economies, including the euro area, is lower by up to 0.3% after three years in response to an around 3% slowdown in China (Chart 14). These effects are broadly in line with the literature, which provides a range of estimates depending on the model and scenario specification.²³ There is also downward pressure on inflation as a result of lower domestic and manufacturing cost pressures in China, combined with the drop in oil and non-energy commodity prices caused by China’s demand slowdown.

²³ See, for example, Dizioli, A., Hunt, B. and Maliszewski, W., “Spillovers from the Maturing of China’s Economy”, IMF Working Paper No 16/212, 2016; *OECD Economic Outlook*, Vol. 2015, Issue 2, Organisation for Economic Co-operation and Development; Furceri, D., Jalles, J. T. and Zdzienicka, A., “China Spillovers: New Evidence from Time-Varying Estimates”, IMF Spillover Task Force, 2016; and Huidrom, R., Kose, A. and Ohnsorge, F. L., “How important are spillovers from major emerging markets?”, World Bank Working Paper No 8093, 2017.

Chart 14

Spillovers from China: “swift rebalancing” scenario

(real GDP, percentage deviations from “limited rebalancing” scenario after three years)



Source: ECB staff calculations.

Notes: Responses to a cumulative slowdown in China of around 3% of GDP after three years. EA = euro area; US = United States; JP = Japan; UK = United Kingdom; OP = oil producers; AS = emerging Asia; RoW = rest of the world.

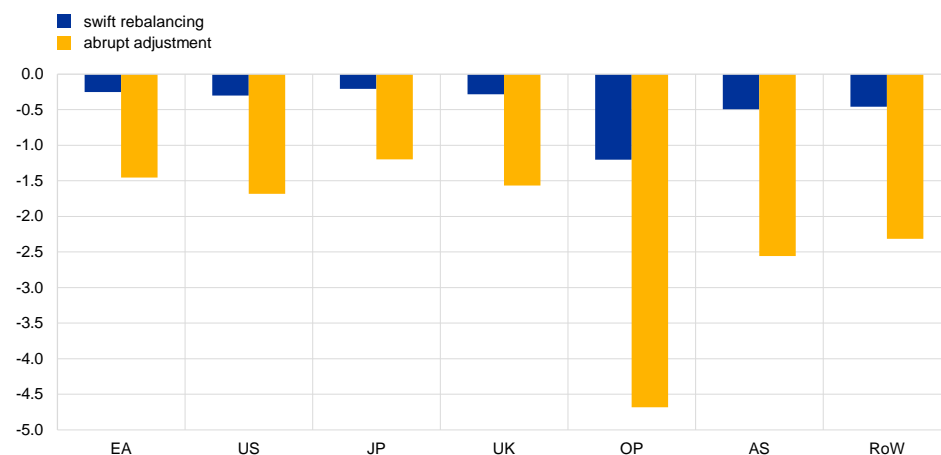
However, the “abrupt adjustment” scenario, driven by significant financial tightening in China, entails relatively larger spillovers. This scenario involves a deeper decline in output growth in China which inevitably has a larger impact on the rest of the world compared with the “swift rebalancing” scenario (Chart 15). However, the different nature of the shock also affects the size of the spillovers. Despite still relatively modest financial linkages with the rest of the world, tighter financial conditions in China are assumed to raise global risk premia. The shock in China therefore propagates both via the trade channel (through lower domestic demand) and the financial channel and, as a consequence, the impact on the rest of the world is larger.²⁴

²⁴ This is consistent with Kalemli-Ozcan, S., Papaioannou, E. and Pedro, J. L., “Financial Regulation, Financial Globalization and the Synchronization of Economic Activity”, *Journal of Finance*, Vol. 68(3), 2013, pp. 1179-1228.

Chart 15

Spillovers from China: “abrupt adjustment” scenario

(real GDP, percentage deviations from “limited rebalancing” scenario after three years)



Source: ECB-Global model.

Notes: The chart shows the fall in GDP resulting from: (1) a “swift rebalancing” scenario in China driven by a slowdown in domestic demand of around 3% of GDP after three years; and (2) an “abrupt adjustment” scenario in China triggered by financial tightening which leads to about 9% lower GDP after three years. EA = euro area; US = United States; JP = Japan; UK = United Kingdom; OP = oil producers; AS = emerging Asia; RoW = rest of the world.

Relaxing some assumptions about the transmission channels and the reaction of policy in different economies implies stronger spillovers from a slowdown in China. The primary source of the scenario results is the ECB-Global model, which includes real and financial cross-country spillovers and therefore provides a framework for exploring the spillover channels in a more consistent manner. Chart 16 based on the “swift rebalancing” scenario illustrates that the cumulative effect of relaxing different assumptions on euro area GDP would be substantially larger. The following sections consider the different channels in more detail.

a) Commodity prices

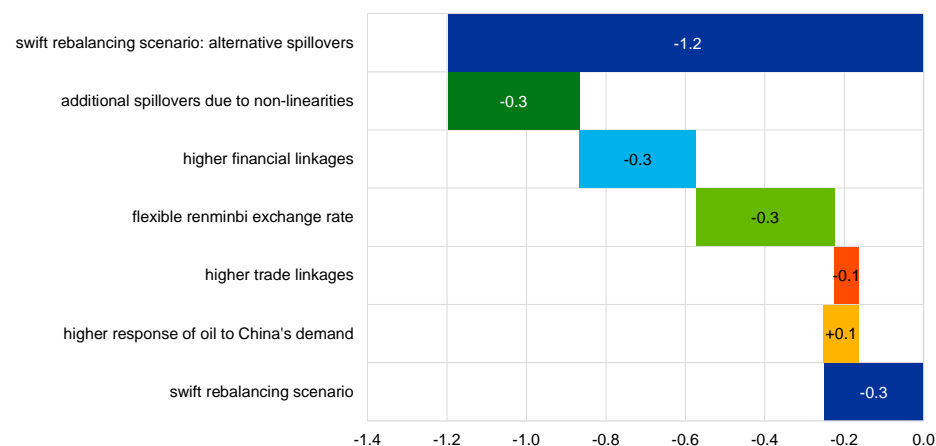
China’s effect on commodity prices could affect the size of spillovers. The range of estimates from the literature of the impact of a slowdown in China on oil and non-oil commodity prices is large. In the “swift rebalancing” scenario, ECB-Global simulations suggest that oil prices would be nearly 6% lower after three years, which is on the low side compared with other estimates.²⁵ Taking oil prices as a proxy for commodity prices means the reduction could be twice as responsive to shifts in China’s demand. With commodity prices responding more strongly, activity in the euro area (and other commodity-importing advanced economies) is cushioned somewhat following a slowdown in China (the second bar in Chart 16).

²⁵ See, for example, Gauvin, L. and Rebillard, C., “Towards recoupling? Assessing the global impact of a Chinese hard landing through trade and commodity price channels”, Banque de France Working Paper No 562, 2015.

Chart 16

“Swift rebalancing” scenario and alternative specifications: euro area GDP response

(percentage deviations from “limited rebalancing” scenario after three years)



Source: ECB-Global model.

Notes: The scenarios are conditioned on the same slowdown in China's GDP (the “swift rebalancing” scenario). The bottom bar shows the deviation of euro area real GDP from the “limited rebalancing” scenario after three years. Each bar above shows the effect of changing an assumption underlying that spillover analysis: (1) doubling the response of the oil price to fluctuations in China's demand; (2) doubling the trade linkages; (3) assuming that China's exchange rate reacts flexibly to the slowdown in output; (4) increasing by a factor of five China's financial linkages with the rest of the world; and (5) taking into account the additional non-linearities arising from combining the blocks together. The top bar shows the cumulative effect of these alternative assumptions on the spillovers to euro area GDP.

b) Trade linkages

There has been a rapid strengthening of global trade linkages with China, which has more than doubled its share in global trade in the last 15 years. This greater integration of China in global trade has also increased the potential for spillovers. However, global macro models are typically calibrated based on average bilateral trade linkages over the past years.²⁶ To illustrate that point, in this alternative scenario a doubling of the trade linkages of advanced economies with China is considered, which broadly corresponds to the increase in direct trade flows from advanced economies to China from 1996 to 2016. The impact of shocks in China on the euro area is predicted to rise slightly as China's importance in global trade has increased (the third bar in Chart 16).²⁷

c) China's exchange rate regime and monetary policy response

Spillovers also depend crucially on the exchange rate regime and the monetary policy response in China. The “swift rebalancing” scenario assumes that China's monetary policy does not react as the economy slows and the exchange rate is assumed to be essentially a “managed float” against the US dollar. However, given recent reforms to liberalise the exchange rate, it may be more sensible to anticipate

²⁶ For example, the trade weights used in ECB-Global are averaged over the period 2009-15.

²⁷ This is consistent with Furceri, D., Jalles, J. T. and Zdzienicka, A., “China Spillovers: New Evidence from Time-Varying Estimates”, IMF Spillover Task Force, 2016.

that China's monetary authorities partly counteract the adverse economic shock by lowering policy rates. This, in turn, leads to a depreciation of the renminbi exchange rate.²⁸ The associated gains in China's price competitiveness would partly offset the adverse implications of the swift rebalancing for activity in China. Accordingly, the scenario is adjusted; it calibrates a combination of gains in price competitiveness and lower demand (in response to the reform efforts), which still generates a 3% lower GDP in China over three years. The associated lower demand from China and the loss in euro area price competitiveness imply a significantly stronger spillover (the fourth bar in Chart 16), with a doubling of the decline in euro area GDP compared with a scenario assuming unresponsive monetary policy in China.

d) Financial linkages

As the strength of financial linkages increases, the impact of a slowdown in China on the global economy may also be stronger. The baseline simulations assume limited financial linkages between China and the rest of the world resulting in small financial spillovers. However, China's financial integration with the rest of the world is increasing rapidly and events during the summer of 2015 illustrate the potential for China to affect global financial markets. To simulate stronger financial linkages with China, the share of financial exposures of each economy to China is quintupled and, correspondingly, the share of financial exposures to the rest of the world is reduced.²⁹ With stronger financial linkages, negative spillover effects on GDP in advanced economies are more than doubled (the fifth bar in Chart 16).

Overall, the model-based sensitivity analysis underscores that the spillovers are complex and dependent on the strength of the various transmission channels, as well as the policy reactions by central banks. Chart 16 illustrates the cumulative effect of the various assumptions on the transmission channels. Assuming a larger impact on commodity prices, stronger trade linkages and a more aggressive policy response in China leading to a renminbi depreciation would double the size of the spillovers. Assuming stronger financial linkages would further increase the effects. Non-linearities that arise from the combination of increased interlinkages and different policy reactions would have a further impact on euro area GDP. Spillovers could be even larger than in the model simulations if a worsening outlook in China were to trigger a synchronised downturn across EMEs and spillovers were to be dependent on policy reactions by central banks. At the same time, policy support in China via fiscal stimulus could theoretically cushion any slowdown.

²⁸ After targeting a stable RMB/USD exchange rate, the Chinese authorities have liberalised the renminbi and now target a basket of currencies.

²⁹ This implies that China and Hong Kong combined would have financial linkages with the rest of the world that correspond to average financial linkages between other economies.

5 Conclusions

China has been the economic success story of the past four decades, but economic growth has been slowing and vulnerabilities are increasing. This article finds that China's heavy reliance on investment and credit has led to increasing indebtedness, which has created vulnerabilities in a number of sectors, including the corporate sector, SOEs, local governments and the real estate market. These fragilities are heightened due to the increased complexity and leverage in the financial system, in particular the marked increase in non-bank lending. Although vulnerabilities have clearly grown, China retains policy space to cushion against adverse shocks. Nonetheless, additional rebalancing and structural reforms could facilitate a shift of China's economy onto a sustainable and strong growth trajectory in the medium term. China's size, trade openness and dominant position as a consumer of commodities mean that its transition is crucial for the global outlook. Compared with its role in global goods and commodity markets, China's integration in global financial markets is considerably lower but growing. This article has provided some quantification of the potential impact of a transition in China on the global and euro area economies. The simulation analysis suggests that the spillovers to the euro area would be limited in the case of a modest slowdown in China's GDP growth, but significant in the case of a sharp adjustment. However, the sensitivity analysis underscores that the spillovers are dependent on the strength of the various transmission channels, as well as the policy reactions by central banks and governments.