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Consequences of an abrupt slowdown in China's property market

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The Chinese property market probably poses one of the greatest downside risks to the global economy in 2014. Construction starts this spring were 20 percent lower than at the same time last year (see Chart 1). At the same time, the stock of unsold properties has risen, and price increases have edged down. In this commentary, we take a closer look at developments in the Chinese real estate market and at transmission channels to other sectors of the Chinese economy and to the global economy.

Norges Bank's projection for economic growth in China in *Monetary Policy Report* 2/14 is just under 7 percent in the coming years. Here we assume a gradual cooling of the real estate market, which will be largely counteracted by policy measures by the authorities. There is nevertheless a risk of a sudden fall in the pace of investment that may have severe contagion effects both in China and globally. According to estimates in this commentary, a cooling of the real estate market in line with previous episodes in other countries may result in a slowdown of GDP growth towards 4 percent in 2015. Under this scenario, global GDP growth may decline by just over one percentage point in 2015, and oil prices will be approximately 25 percent lower by the end of 2015.

Chart 1 Construction starts and property sales. Residential, office and commercial buildings. 12-month growth. Percent. 3-month moving average. January 2007 – May 2014

Source: CEIC

Background

GDP growth in China has declined from an average of 12 percent in the years prior to the crisis, to an average of below 9 percent since 2008. In the same period, average investment growth has remained robust at around an annual rate of 25 percent. Investment growth has slowed in infrastructure and manufacturing from the levels prevailing prior to the financial crisis, while growth in real estate investment has increased (see Chart 2). Up until 2010, construction starts increased in pace with rising demand, but have since increased considerably faster than home sales. Housing starts totalled nearly 1.5 billion square metres in 2013, and the volume under construction in the past three years has equalled four years of sales (see Chart 3). The high level of construction activity has also spread from the relatively wealthy cities along the east coast to inland regions (see Chart 4). This may reflect stricter regulations, especially in high-priced eastern regions. The result has been that developers have largely moved

their activities to smaller cities and inland regions.

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Chart 2 GDP and Fixed Asset Investment (FAI). Average annual growth in percent.
2005 - 2013

Source: CEIC
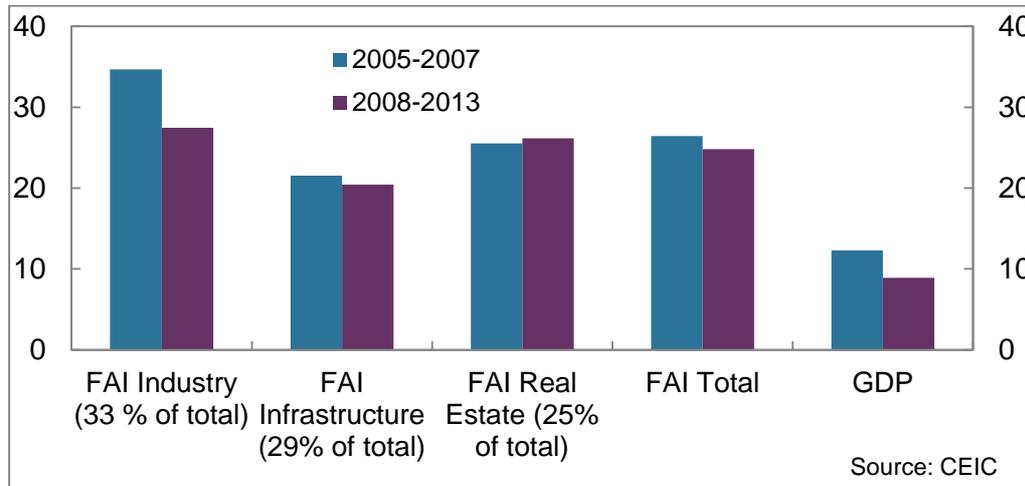
Chart 3 Housing supply indicator. The relationship between housing under construction and annual housing sales. 1999 - 2013

Source: CEIC
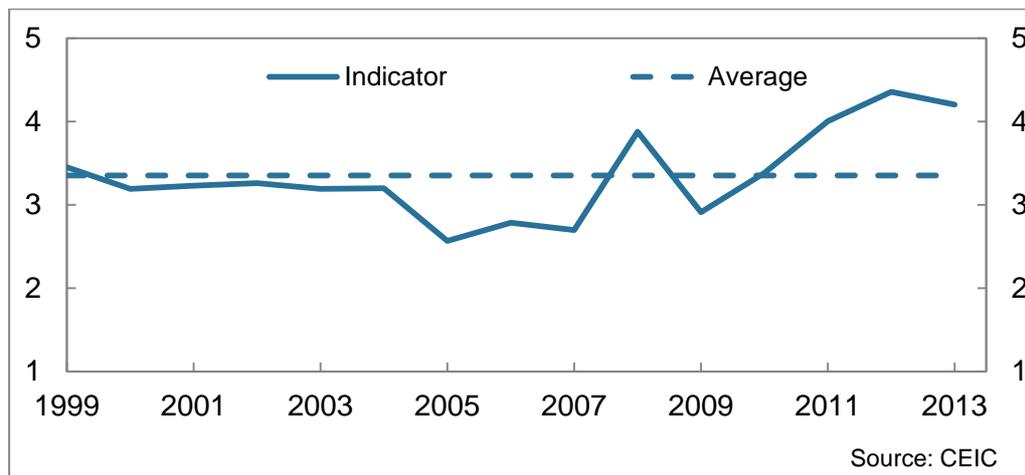
Chart 4 Housing supply indicator. The relationship between housing under construction and annual housing sales. 2009 - 2013

Source: CEIC
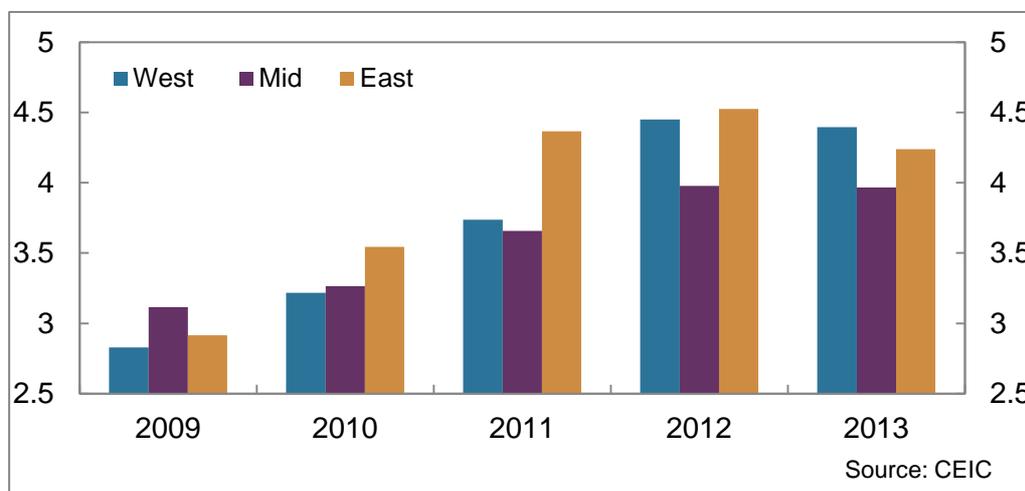
Chart 5 shows changes in supply and demand in the urban housing market. We have estimated that increased demand from urbanisation was around 4 million units in 2013, compared with a supply of just under 11 million (see Appendix 1 for details concerning this estimate). The gap has widened from around 3 million units in 2010 to 7 million in 2013. Given the authorities' target for 60 percent of the population to be urbanised by 2020, the pace of urbanisation will slow further ahead, even under a successful urbanisation policy. Housing supply not matched by increased urbanisation must be counterbalanced by *demand for upgrades and for investment.*

The *demand for upgrades* is determined by the need for new dwellings as the existing housing stock ages. High income growth has contributed to substantial housing upgrades in the past decade, but nearly 60 million urban households still inhabit dwellings from before 1990 that will probably be upgraded in the period ahead (see Chart 6). Given the depreciation rate for housing in China and the composition of the urban housing stock in 2010, we estimate that around 3 million dwellings have been condemned in the past years.[1] Owing to the higher quality of newer buildings, the depreciation rate is likely to level off and the service life of dwellings will increase ahead. However, continued high income growth may sustain demand for upgrading.

So far, housing has been a popular investment among Chinese households, owing to capital controls, which have limited international capital flows, and a fairly undeveloped domestic financial system. Alternatives to investing in housing have been limited to investment in the domestic stock market or in bank deposits at very low (regulated) interest rates. Now, however, there are strong indications that *investment demand* for housing has peaked. Housing has become less attractive on account of anti-corruption campaigns and slowing house price inflation. In addition, there is a steady increase in the availability of alternative investments in the shadow banking market and abroad. With continued liberalisation of the financial sector and international capital movements, these developments are likely to continue.

Overall, high demand for upgrading and investment has helped to balance the Chinese housing market, even though the pace of urbanisation has slowed. A completion rate of 10 million units per year is probably not much higher than actual growth in demand. Dwellings under construction, however, are far higher than this (approximately 57 million units by end-2013), and with prospects for slower growth in urbanisation and lower demand for housing as an investment, housing starts will likely have to decline substantially to avoid a sharp fall in prices.

Transmission channels from the real estate sector

Lower real estate investment will impact GDP directly and result in lower demand from other sectors. Private housing investment accounts for approximately 16 percent of Chinese GDP[2], and construction is the sector with the second highest demand for goods and services from other sectors in China. On the basis of input-output tables from the national accounts, we find that close to 60 percent of demand for building materials and more than 15 percent of demand for transport services and metal products come from the construction sector (see Chart 7). Lower construction activity will therefore have a considerable impact on output and investment in these sectors. At the same time, a fall in real estate turnover and prices will result in a worsening of the financial position of local authorities. Local authorities account for a large share of investment in China, and land sales constitute a third of their income. In addition,

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[1] The depreciation rate is estimated on the basis of changes in the stock of housing of various ages between 2000 and 2010. The depreciation rate was 2.5 percent for dwellings between 20 and 30 years old, 2.6 percent for dwellings 30 to 40 years old, 3.7 percent for dwellings 40 to 50 years old, 5.8 percent for dwellings 50 to 60 years old and 7.7 percent for older dwellings. For dwellings built in the 1990s, we have assumed an annual depreciation rate of 2 percent.

there is a risk that a prolonged downturn in turnover and prices will result in a sharp increase in defaults, amplifying the slowdown in growth through weakened confidence in the financial market (see Appendix 2).

Chart 5 Housing supply and demand in urban areas. Million housing units. 2000 - 2013

Sources: CEIC, Thomson Reuters and Norges Bank
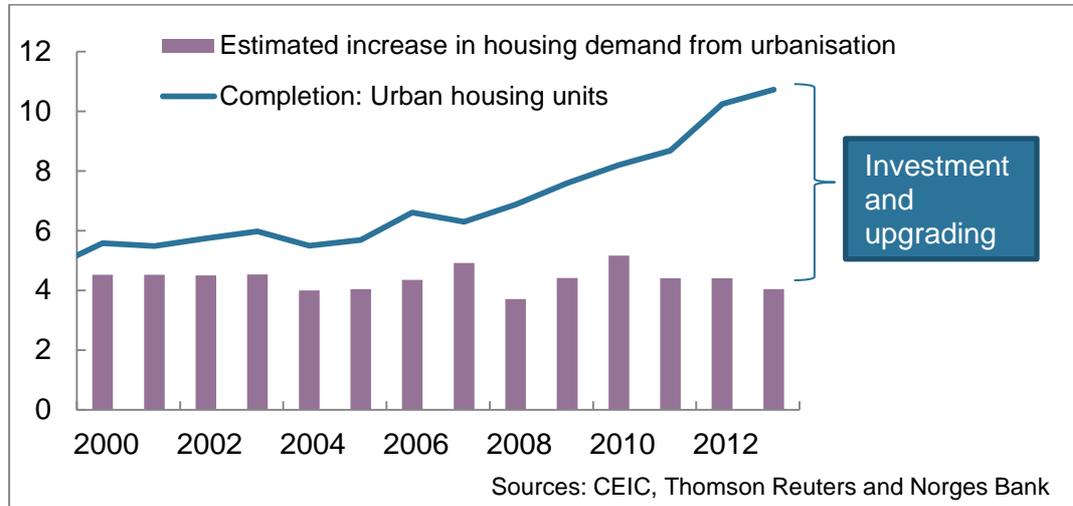
Chart 6 Year of construction for existing houses. Urban households. Millions.

Source: 2010 Census NBS
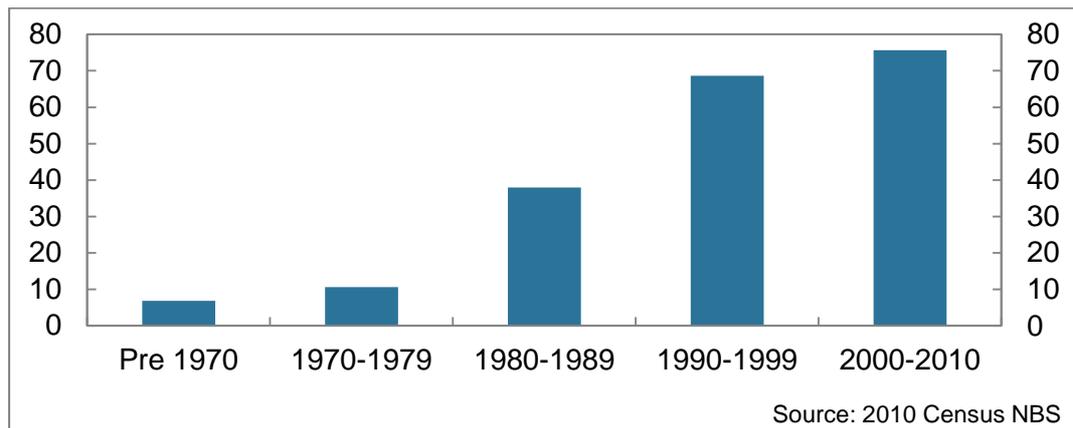
Chart 7 Demand from the construction sector as a percentage of total demand in various sectors.

Source: CEIC
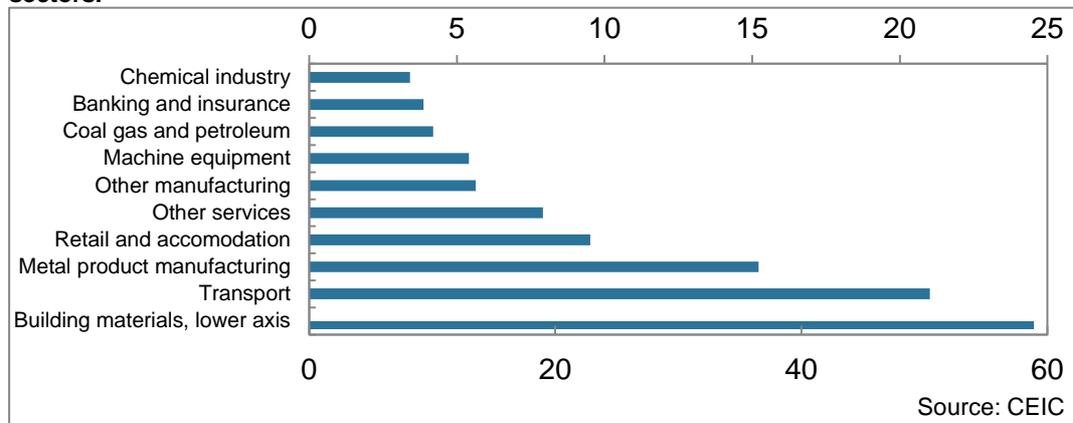
[2] According to official data, housing investment was just under 13 percent of GDP in 2013 and accounted for approximately 2/3 of total real estate investment. These figures also include transactions in the second-hand market and lot sales. In addition, investment by property developers is estimated at cost. We have corrected for this by deducting expenses for lot purchases and adding an estimate for property developers' margins. The estimates follow the methodology described in Koen et al. (2013).

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Impact in China

To calculate possible impacts of a decline in real estate investment in China, we have estimated a simple vector autoregressive (VAR) model. The model includes real estate investment and GDP, in addition to exports, retail sales, manufacturing output, money supply (M2) and infrastructure investment.[3] We find that a 5 percent quarter-on-quarter decline in real estate investment will reduce GDP by approximately 0.4 percent over the three subsequent quarters (see Chart 8). The pace of growth in infrastructure investment quickens and the money supply increases in the quarters following a negative shock in real estate investment. This reflects the authorities' countercyclical policies in previous episodes of a slowdown in housing investment.

On the basis of the results from the VAR analysis, we examine two scenarios for GDP growth in China, given developments in real estate investment (see Chart 9). In the first scenario, the *policy scenario*, we specify a negative shock to real estate investment in one quarter (2014 Q2) which results in a decline of 15 percent relative to trend.[4] Here policy measures by the authorities contribute to a rapid return of investment growth to trend. GDP in this scenario will be approximately 1¼ percent lower by end-2015 compared to a baseline scenario based on historical trend growth in housing investment.

In the second scenario, the *downside scenario*, we specify that real estate investment will slow close to 4 percentage points as a share of GDP between 2013 and 2015. To attain this, we have set a decline in the pace of growth in real estate investment at just above 12 percentage points for four quarters in a row before the pace of growth gradually increases.[5] Real estate investment will, in this case, fall 40 percent relative to trend by end-2015, and GDP will be around 4 percent lower than in the baseline scenario.

Chart 8 Response from a shock in real estate investment. Change in quarterly growth due to a negative shock of five percentage points in real estate investment in period 0. Percentage points.

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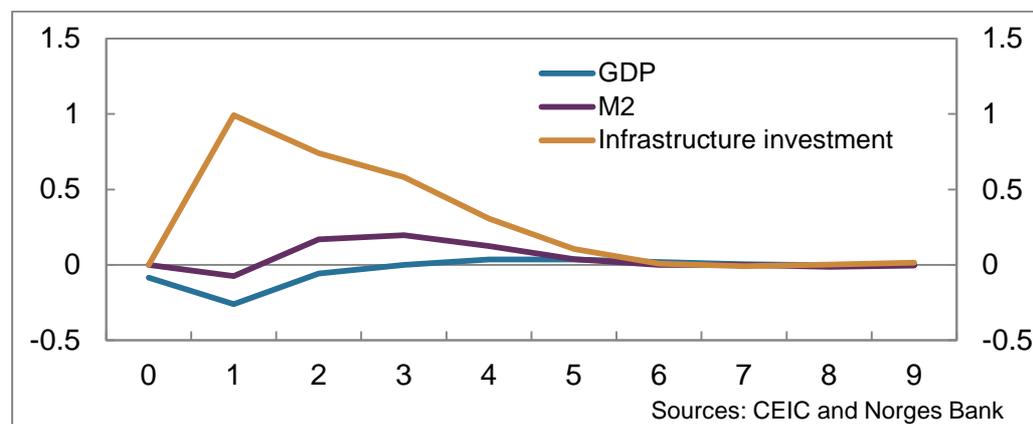
[3]The model is estimated using quarterly seasonally adjusted series from 2004. Volume series are used for GDP, exports and retail trade. Investment series are deflated by price series for building materials. The model is estimated on growth form (first differences) with a lag. To identify the structural parameters in the model we use standard recursive identification (Cholesky) where the sequence of variables is as follows: Exports, money supply, retail trade, infrastructure investment, real estate investment, GDP. This is a conservative way of identifying a shock to GDP from real estate investment, since other variables cannot react to a shock in real estate investment in the current period. The results are robust for other structural specifications, but the effects on GDP from real estate investment will be larger if they are moved further ahead in the recursive ranking.
[4] Given quarterly trend growth of 5 percent, this will entail a quarter-on-quarter decline in real estate investment of 10 percent.
[5] Given quarterly trend growth of 5 percent, this will entail a quarter-on-quarter decline in real estate investment of just over 7 percent for four quarters before investment growth gradually returns to trend. This implies a decline in real estate investment of close to 15 percent between 2013 and 2015. Given average nominal GDP growth of 7 percent, real estate investment's share of GDP growth will decline by close to 4 percentage points.

Chart 9: Downside scenarios. Real Estate Investment and GDP in China. Index. 2014 Q1 = 100. 2014 Q1 – 2015 Q4
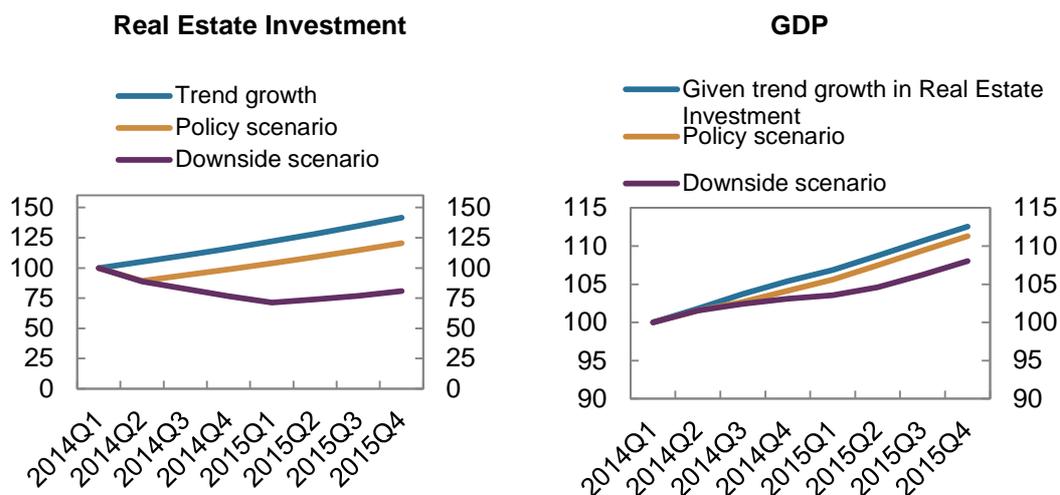
Sources: CEIC and Norges Bank

Global impact

A sudden decline in growth in China will have global contagion effects both through reduced demand for goods and services and through greater uncertainty in global financial markets. We have used the IMF's Global Projection Model (GPM) to quantify possible global contagion effects. The GPM is a quarterly global forecasting model with seven regions and commodity prices.[6] For each region there is a set of equations that describe the dynamic relationship between macroeconomic variables such as output, inflation, interest rates and exchange rates. The model also takes into account changes in external demand, and the fact that changes in financial conditions in the G3 countries (the US, the euro area and Japan) can affect output nationally and in other regions. Thus, the GPM constitutes a structured global framework that is suited to analysing the contagion effects of a shock in China to other regions and to commodity prices.

In the GPM, we have set quarterly GDP growth in China in accordance with the two scenarios above. Despite the fact that China has strong restrictions on capital movements to other countries, there is a risk of a considerable slowdown in the real estate sector and financial turbulence in China will contribute to greater uncertainty in global financial markets. We have taken this into account by setting tighter financial conditions in the US, Europe and Japan.[7]

In the *policy scenario*, the impact on Norway's most important trading partners will be moderate, with less than ½ percentage point cumulative decline in growth by end-2015 (see Chart 10). In the *downside scenario*, however, the contagion effects are considerably greater, and the pace of growth among trading partners continues to slow until 2015 Q2. The cumulative decline in growth by end-2015 is approximately 1½ percentage points. The impact is greatest in other Asian countries, including Japan, owing to the substantial trade between these countries and China (see Table 1). The impact on the US and euro area through the trade channel is slight, with most of the impact in these countries transmitted via financial markets. In Latin America,

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[6] See Carbenciov et al. (2013) and Blagrave et al. (2013).

[7] In the GPM, financial conditions are adjusted by a variable for tightness in banks' credit standards. In the policy scenario, we specify that the deterioration of credit standards will be 10 percent of what it was during the financial crisis in 2008/2009 in the US and Europe and 25 percent in Japan. In the downside scenario, we assume a deterioration equivalent to half of the financial crisis in the US and Europe and 75 percent in Japan. This may be viewed as a ceiling for how high we regard the potential impact via credit markets.

commodity exporters will be affected by lower demand and prices. Lower Chinese demand for oil will likely be the most severe impact on Norway. In the *downside scenario*, the oil price falls by about 25 percent by end-2015, to slightly over USD 80 per barrel. Such a price decline will have a substantial impact on profitability and investment in the Norwegian and foreign petroleum sector. This, in turn, will affect Norwegian enterprises with turnover in the oil and gas sector (see Brander et. al, 2013).

Chart 10 Impact on Norway's 25 main trading partners. Quarterly GDP growth. 2012 Q1 – 2016 Q4

Sources: Thomson Reuters and Norges Bank
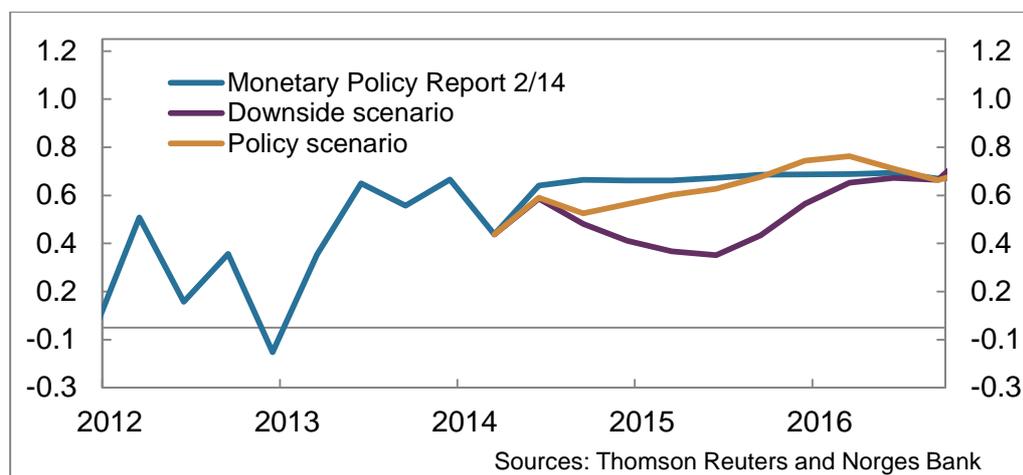
Table 1 Global impact. Percentage point change in annual growth compared with the main scenario.

	Policy scenario				Downside scenario			
	GDP		Inflation		GDP		Inflation	
	2014	2015	2014	2015	2014	2015	2014	2015
Global	-0,2	-0,3			-0,4	-1,3		
China	-0,6	-0,6	-0,1	-0,3	-1,2	-2,7	-0,1	-0,7
Euro area	-0,1	-0,3	-0,1	-0,3	-0,1	-0,9	-0,2	-1,1
USA	-0,1	-0,2	-0,1	-0,4	-0,2	-0,8	-0,3	-1,2
Japan	-0,1	-0,4	-0,1	-0,2	-0,2	-1,2	-0,1	-0,7
EM Asia excl. China	-0,3	-0,4	0,0	-0,2	-0,6	-1,7	-0,1	-0,5
Latin America	-0,1	-0,3	0,0	-0,1	-0,2	-0,9	0	-0,4
Oil price			-2,3	-6,0			-3,9	-18,2

Appendix 1: Estimation of housing demand on the basis of urbanisation

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On the surface it may appear that new housing completions in China have been approximately in line with the pace of urbanisation (see Chart 11 (broken lines)). The urban population increased by around 21 million per year in the course of the past decade and by 19 million in 2013. This corresponds to around 7 million households. Completions of urban housing units in the commercial market were at around 7.5 million.

If we include public housing and other housing units outside the private market, however, close to 11 million units were completed. In addition, the data for total urbanisation probably overestimates the underlying demand for new housing. Only 13 million of the 21 million increase in the urban population was an increase in the urban *hukou* population.[8] The remainder are non-*hukou* migrants from rural areas who have scarce opportunity to enter the urban housing market. Of the 13 million increase in the urban *hukou* population, the majority are a statistical re-classification of persons, since urban areas are expanding. Among them, it is likely that only a minority will need new housing on account of the demolition of old residential areas. In Chart 12, we have specified that 75 percent of the increase in the *hukou* population and 10 percent of the increase in the migrant population contribute to actual demand for housing. This results in a demand from urbanisation of around 4 million units in 2013, compared with a supply of just under 11 million. The gap has widened from around 3 million units in 2010 to 7 million in 2013. Given the authorities' urbanisation target of 60 percent by 2020, the pace of urbanisation will continue to slow, from 19 million in 2013, to an average of around 14 million in the period to 2020 (see Chart 12). That is, the growth impulses to the demand for housing from urbanisation will ease further, even under a successful urbanisation policy.

Chart 11 Housing supply and demand in urban areas. Million housing units

Sources: CEIC, Thomson Reuters and Norges Bank

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[8] *Hukou* is the registration system for households in China. Migrants without urban *hukou* status do not have the same access to health care, education or other welfare benefits as the registered urban population.

Chart 12 Urban population in China. Million persons and as a percentage of total population. 2001-2020

Change in urban population (millions), left axis

Change in urban population given the government's urbanisation target and the United Nations Population projections
Percentage urbanised, right axis

Estimated percentage urbanised, given the government's urbanisation target

Sources: CEIC and Norges Bank

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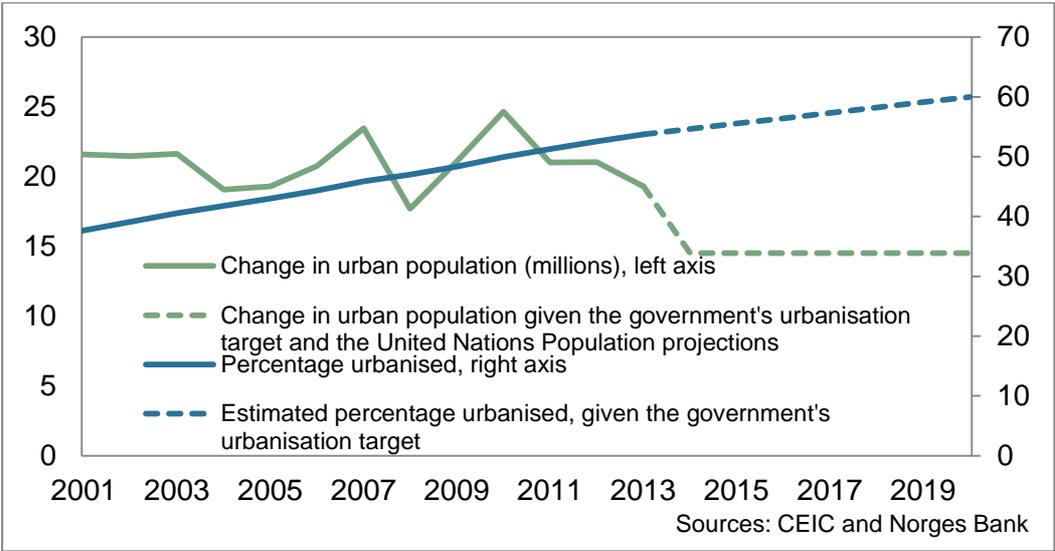
Appendix 2: The financial system's exposure to the real estate sector

Total credit outstanding in China has tripled since the beginning of 2008, and has increased by more than 70 percentage points as a share of GDP, to close to 200 percent. This is more than we have seen in previous run-ups to banking crises (see Chart 13). A large proportion of the increase in credit is due to the authorities' package of economic measures in 2008, which was primarily financed by loans from state-owned banks. A considerable share of this went to the housing sector, and new bank lending for investment in real estate increased by over 60 percent between 2007 and 2009.

Since 2009, total credit has grown far faster than bank credit on account of the rapid growth in lending from entities outside the formal banking system (so-called shadow banks) (see Chart 14). This largely reflects the fact that banks have moved lending activity off their balance sheets to avoid limits on some types of loans, including to the housing sector. Bank loans as a share of overall financing for property developers have fallen from 15 percent in 2009 to 10 percent in 2013. At the same time, the share of capital obtained from other sources has risen by a corresponding amount, from 12 percent to 17 percent (see Chart 15).[9]

Data for bank lending show that direct exposure to the real estate sector is around CNY 15 trillion, just under 20 percent of total lending. The total exposure to the financial system, however, is far higher. Reported trust loans to the real estate sector is around CNY 1 trillion, but on the basis of credit growth to property developers, lending from the shadow banking sector is probably at least four to five times higher.

Banks bear no risk in principle on lending taking place through shadow banks. Nevertheless, several factors suggest that portions of any losses from a marked cooling of the real estate market will have to be covered by banks. The reason for this is that trust loans are often transferred to trusts from banks, which at the same time assist with funding the loan by raising capital from banks' customers. Investors often regard the products as secured or implicitly guaranteed by the issuer or bank.[10] However, shadow banks have limited capital. In addition, many trusts fund their activities by short-term deposits from investors or in the interbank market, while they lend to long-term projects in real estate, infrastructure or mining.

There is little indication of a major crisis in the Chinese financial system. Households' mortgages are relatively limited, Chinese banks' capital ratios are solid and the authorities have both policy tools and financial means to respond to substantial losses at banks. Nevertheless, a combination of short-term funding and bad loans in the shadow banking sector means that there is a risk for weakened confidence and turbulence in financial markets. Housing developers have tolerated high interest rates in the shadow banking market as long has housing prices have been rising, but a prolonged downturn in turnover and prices may lead to a sudden increase in defaults in the period ahead. The lack of transparency in the shadow banking sector means there is uncertainty regarding links between institutions, which in this situation may result in considerable contagion effects in the financial system.

[9] In 2013, most financing came from advance sales of properties (22 percent) and retained profits (20 percent).
[10] According to estimates from the IMF (2013), the expected return is approximately the same on secured and unsecured investment products.

Chart 13 Change in private debt/GDP around banking crises

USA (2000 - 2013)
Euro area (2001 - 2013)
United Kingdom (2001 - 2013)
China (2008 - 2013)
Spread in the sample of earlier crises[1]

Sources: World Bank, BIS, IMF, Thomson Reuters, CEIC and Norges Bank
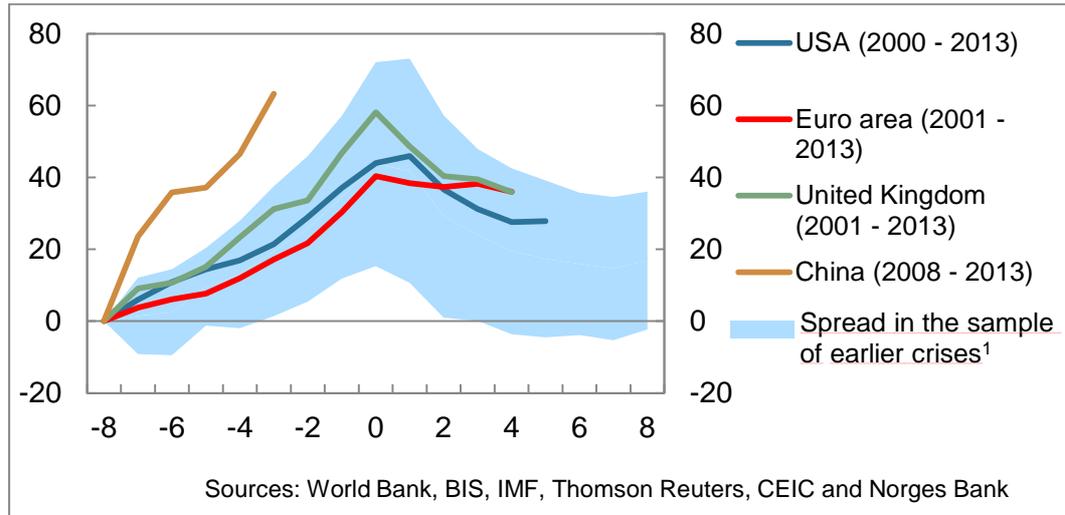
1) Chile (1981), Norway, Sweden and Finland (1991), Mexico (1994), Philippines, Indonesia, Japan, Malaysia og Thailand (1997), Nicaragua (2000), Uruguay (2002)

Chart 14 Total credit in China. As a percentage of GDP. 2003 Q1 – 2014 Q1

Bank loan   Non-bank

Sources: CEIC and Norges Bank
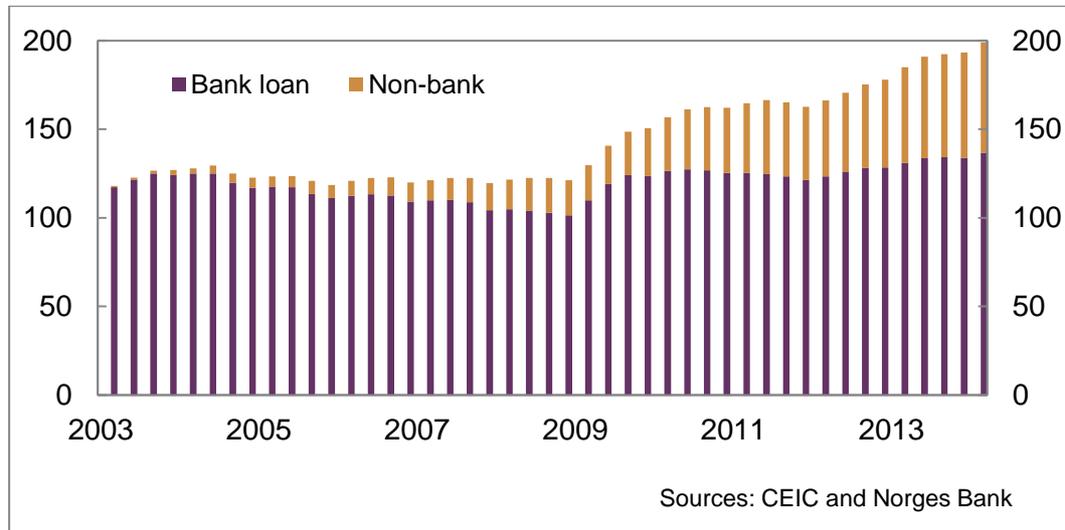
Chart 15 Source of funds. Real estate investment. 2005 - 2013

International capital
Other
Housing loans
Bank loans
Equity
Other sources including shadow banking
Retained earnings
Housing pre-sales

Sources: CEIC and Norges Bank
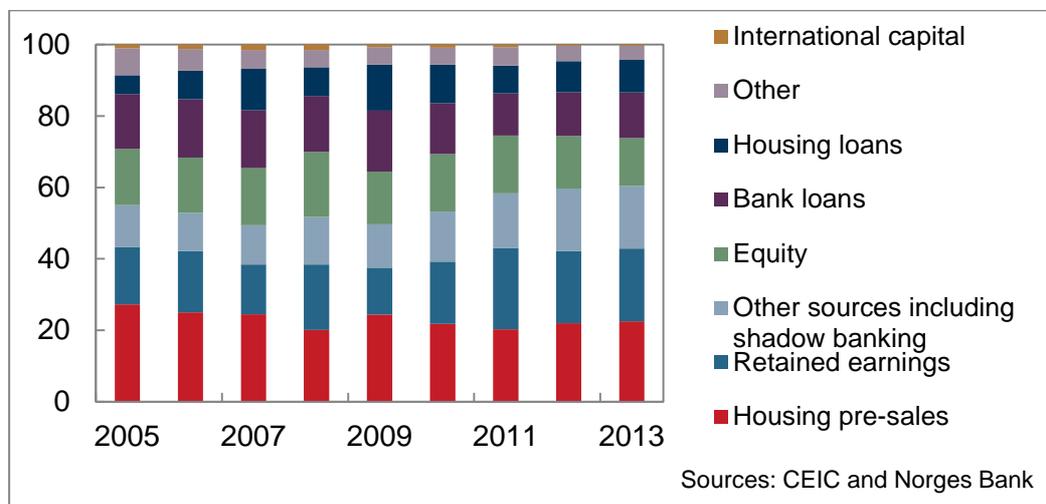
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http://dx.doi.org/10.1787/5k3xz6hc2z0x-en