

China: growth, urbanisation and mineral resource demand

Jin Liu and Tony McDonald¹

Over recent decades, China has experienced rapid economic growth and a related sharp increase in its rate of urbanisation. The speed of this transition, along with the sheer size of China's population, has resulted in China being an increasingly significant driver of global growth and mineral resource demand over the past decade.

This paper analyses trends in China's growth, urbanisation and mineral resource demand. It compares China's experience in recent decades with that of other Asian emerging economies over the past half-century. It also seeks to put the recent surge in Chinese growth and urbanisation in a longer-term perspective.

It concludes that, since the convergence of China's level of economic activity and urbanisation with those of more developed countries is far from complete, China will continue to be a major source of demand for mineral resources for some time to come.

¹ The authors are from Macroeconomic Policy Division, the Australian Treasury. This article has benefited from comments and suggestions provided by James Kelly, Tim Wong, Adam Young, Niloofar Rafiei, Nghi Luu, Dhruv Sharma, Dong Zhang, Ben Ralston and David Gruen. The views expressed are those of the authors and not necessarily those of the Australian Treasury.

Introduction

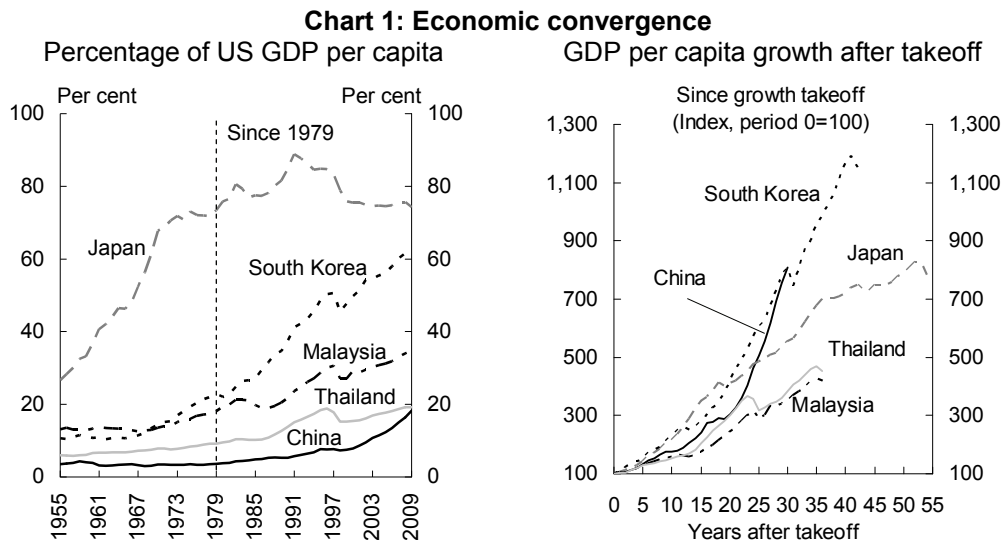
Under the leadership of Deng Xiaoping, at the end of the 1970s China embarked upon a series of economic reforms aimed at opening up the economy to competitive forces. In the three decades since, China has experienced high and sustained economic growth. Over the same period, China has seen a rapid increase in the proportion of its citizens living in cities.

The effect of these related trends, along with the sheer size of China's population, has had a significant impact on the world economy generally, and demand for mineral resources in particular.

This paper analyses trends in China's growth, urbanisation and mineral resource demand. It compares China's experience in recent decades with that of other Asian emerging economies. It also seeks to put the recent surge in Chinese growth and urbanisation in a longer-term perspective.

China's economic convergence

Over the past three decades the Chinese economy has maintained an average of around 10 per cent annual growth rate, equivalent to doubling in size every eight years. This has been a period of rapid economic convergence for China, with its real GDP per capita rising from below 4 per cent of that of the United States in 1980 to 18 per cent in 2009 (Chart 1).

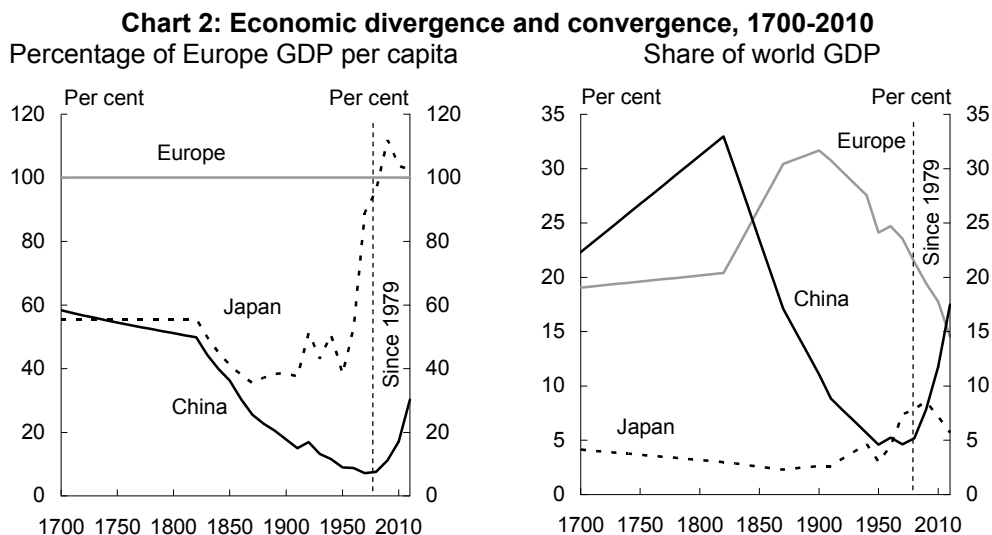


Note: GDP per capita is in purchasing power parity (PPP) terms. Growth takeoff is assumed to occur in 1955 for Japan, 1967 for South Korea, 1973 for Malaysia and Thailand, and 1979 for China.
Source: The Conference Board Total Economy Database and Treasury.

While China's economic convergence has been very rapid, it is broadly in line with the pace of expansions in South Korea from 1967 and Japan from 1955 (Chart 1). In part, the speed of China's economic convergence reflects the fact that it started its expansion from a significantly lower base than many other Asian economies. For example, in 1955 Japan's real GDP per capita was around 27 per cent that of the United States, higher than China's relative level of 18 per cent in 2009. Further, as the global frontiers of income and productivity continue to be extended over time, the latecomers (such as China) can move more rapidly than their predecessors (Garnaut 2006).

Even after three decades of strong growth, China's level of real GDP per capita is still well below that of several recently industrialised economies, such as Malaysia and South Korea, suggesting that there is significant remaining potential for economic convergence. For that potential to be realised, policy settings and institutional arrangements will need to be supportive of growth, with further reforms needed to address remaining barriers to growth. Further, the path of economic convergence is rarely smooth – as illustrated by the impact of the Asian Financial Crisis in the late 1990s.

A longer-term perspective also suggests the potential for further economic convergence by China. It is estimated that three hundred years ago China's GDP per capita was similar to that of Japan and around 60 per cent of that of Western Europe. For most of the past three hundred years China has experienced economic divergence, as Western Europe grew while China's real GDP per capita was stable or fell. The speed of China's convergence is illustrated by nearly half of this divergence being recovered in the past three decades (Chart 2).



Note: Europe is Western Europe. GDP measured by 1990 PPP-adjusted international dollars.
 Source: Maddison 2007, The Conference Board Total Economy Database and Treasury.

China: growth, urbanisation and mineral resource demand

A similar pattern is evident in China's share of world GDP. Two hundred years ago, China accounted for over 30 per cent of world GDP, declining to around 5 per cent by 1980, with around half of that decline reversed over the past three decades (Chart 2).

The sheer size of China's population means that its economic convergence has had a significantly greater impact on world economic activity than that of other Asian economies. In 2010 China's population of 1.35 billion people is eleven times larger than that of Japan (127 million) and 28 times larger than that of South Korea.

The combined effect of China's large population and rapid economic convergence has seen it move from the 12th largest economy in the world in 1980 with GDP of 9 per cent of that of the United States, to now be the second largest economy in the world, equivalent to about 60 per cent of the size of the United States (Table 1). By 2015, China's GDP is projected by the IMF to be nearly the largest economy in the world at over 90 per cent of the size of the United States' economy.

Table 1: Ranked world largest economy (PPP US\$ billions)

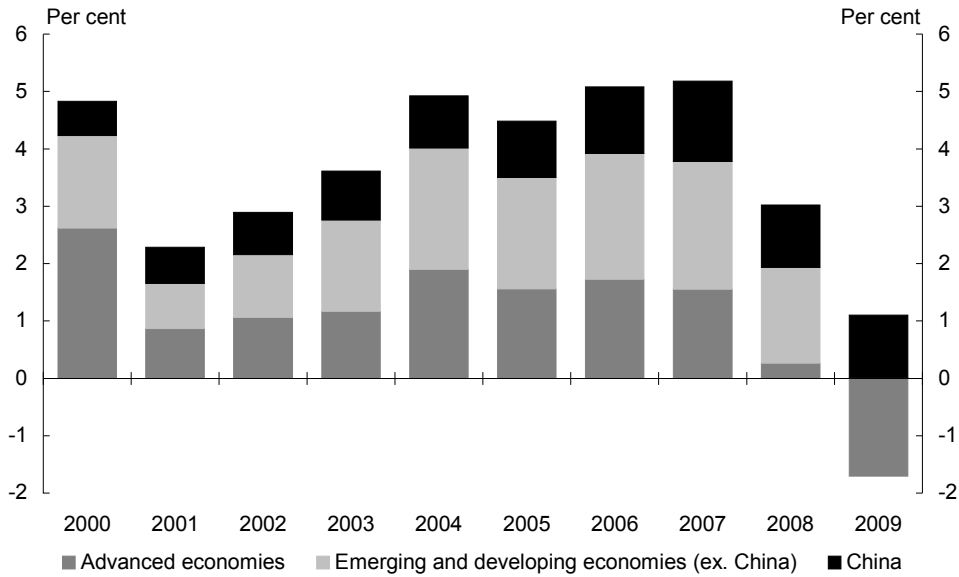
Ranking		1980	% US	Ranking		2009	% US
1	United States	2,788	100	1	United States	14,256	100
2	Japan	1,040	37	2	China	8,765	61
3	Germany	758	27	3	Japan	4,159	29
4	France	535	19	4	India	3,526	25
5	Italy	507	18	5	Germany	2,806	20
6	United Kingdom	486	17	6	United Kingdom	2,139	15
7	Brazil	444	16	7	France	2,108	15
8	Mexico	333	12	8	Brazil	2,013	14
9	India	277	10	9	Italy	1,740	12
10	Spain	272	10	10	Mexico	1,466	10
...
12	China	248	9
16	Australia	149	5	16	Australia	851	6

Note: Gross domestic product based on purchasing-power-parity (PPP) valuation of US\$ GDP.

Source: IMF and Treasury.

This impact is also reflected in China's contribution to world economic growth in the past decade (Chart 3). Over the past decade (2000 to 2009) the world economy grew by 36 per cent. Despite only representing about 7 per cent of the world economy at the start of the decade, China contributed 9½ percentage points, or around 26 per cent of world growth over this time. If China had grown at the same pace as the rest of the world, average annual world growth would have been around 1 percentage point lower than it was over the past decade (that is, 3 per cent rather than 4 per cent).

Chart 3: Contributions to world real GDP growth

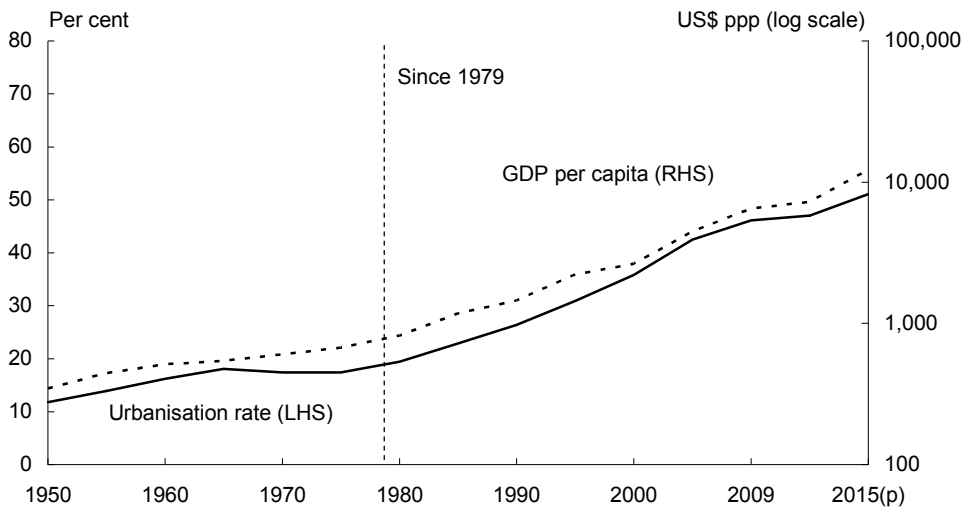


Source: IMF and Treasury.

China's urbanisation convergence

China's rapid economic convergence has coincided with rapid urbanisation. Since 1979 (the beginning of the reform period), the share of China's population living in urban areas has increased by 27 percentage points, from 19 per cent to 46 per cent in 2009 (Chart 4).

Chart 4: Urbanisation and GDP per capita in China



Source: United Nations, IMF and Treasury.

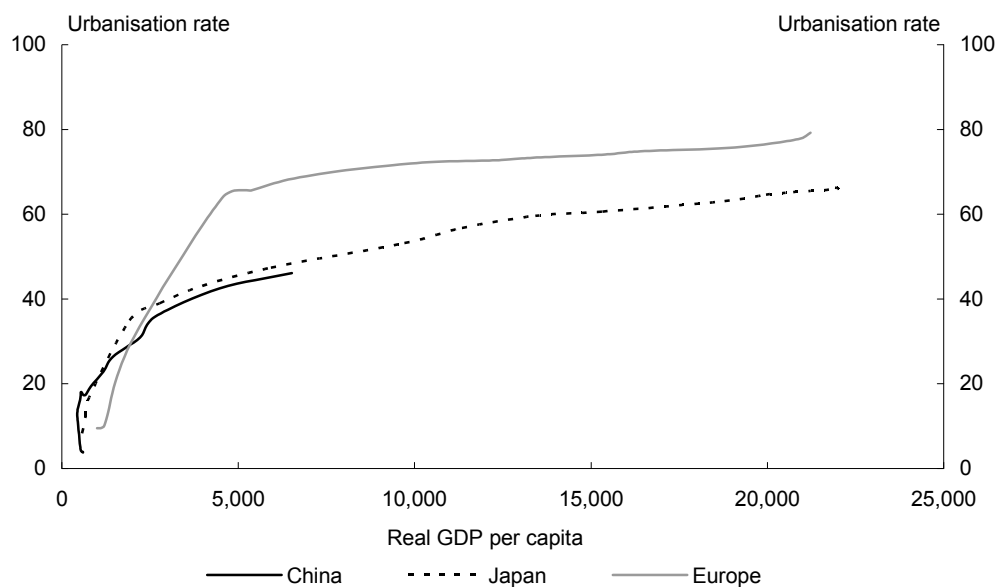
China: growth, urbanisation and mineral resource demand

Nearly all middle-income countries have an urbanisation rate of at least 50 per cent, and all high income countries have an urbanisation rate above 70 per cent (Commission on Growth and Development, 2009). While the correlation between economic growth and urbanisation is clear, the direction of causality is not. That is, does economic growth cause urbanisation or does urbanisation cause economic growth? The most likely answer, at least in China's case, is that the causality runs in both directions – that is, a little bit of both.

Economic reforms from the end of the 1970s set in train a process of industrialisation, capital deepening and productivity improvements that increased the demand for labour in urban areas, with workers attracted to cities by higher wages (Zhang and Song 2003). At the same time, productivity improvements in the agricultural sector, combined with a shortage of arable land meant that a significant amount of labour could move from rural areas without a reduction in agricultural production (Cai 2003). Urbanisation also contributes to economic growth through more rapid productivity growth in cities (Commission on Growth and Development 2009).

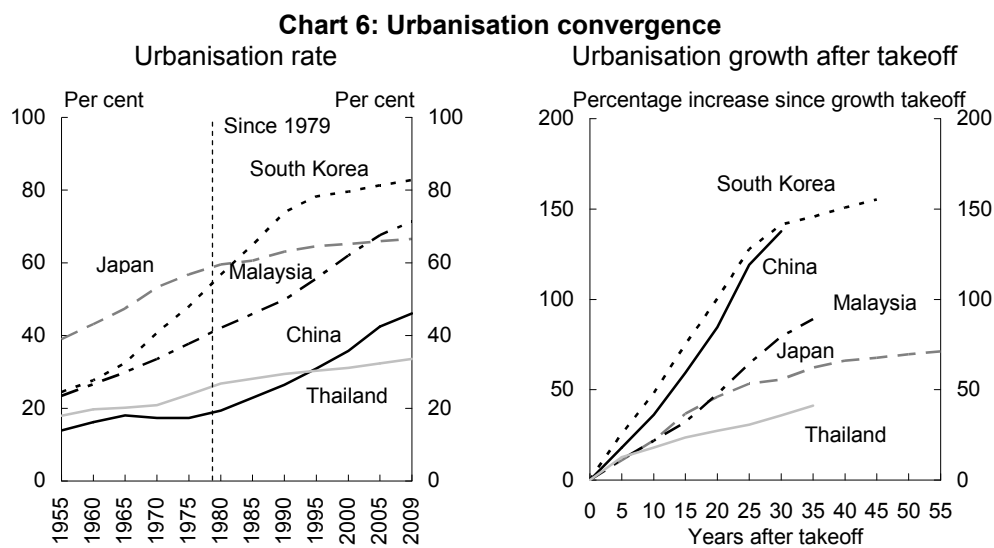
The relationship between economic growth and urbanisation is non-linear. The higher the level of GDP per capita, the smaller is the increase in the urbanisation rate for a given increase in GDP per capita. The relationship between China's urbanisation rate and GDP per capita is similar to that of Japan, but somewhat below that of Western European countries (Chart 5).

Chart 5: Relationship between income and urbanisation, 1700-2009



Note: GDP per capita was measured by 1990 PPP-adjusted international dollars. Europe is Western Europe. Source: United Nations, The Conference Board Total Economy Database, Maddison 2007 and Treasury.

China's rapid economic growth since 1979 has coincided with rapid growth in urbanisation, with the pace of urbanisation surpassing that of other Asian economies, with the exception of South Korea (Chart 6). In part, this reflects China's lower urbanisation rate when it commenced economic reform. Indeed, the level of China's urbanisation today was achieved by Japan, South Korea and Malaysia in 1965, 1975 and 1985 respectively (Chart 6). This suggests that there is significant scope for further increases in China's urbanisation over coming decades, with the United Nations projecting that China's urbanisation rate will reach 51 per cent in 2015 and 73 per cent in 2050.

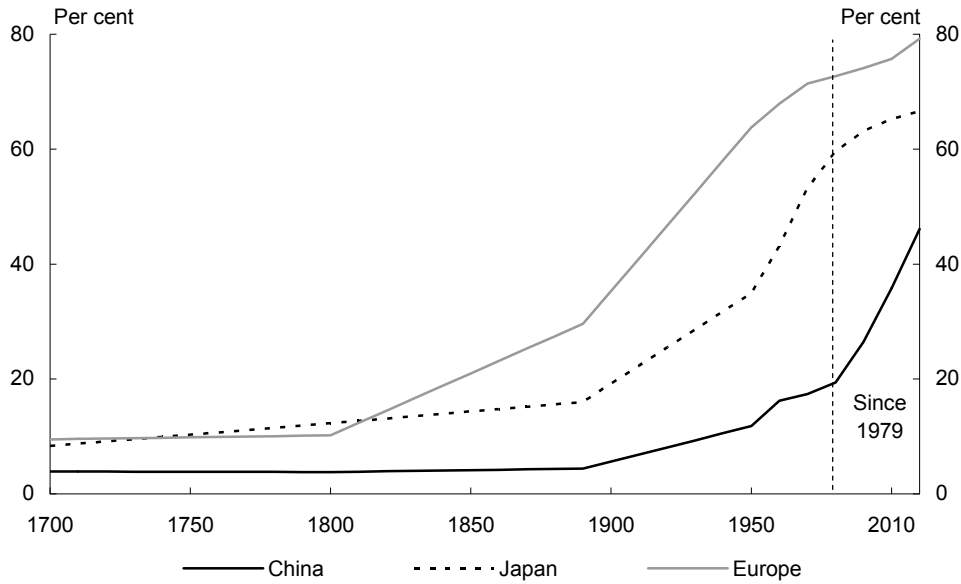


Note: The comparisons between countries need to be made with caution as national statistical agencies reporting to the UN often use different definitions for 'urban'. See United Nations (2007).
 Source: United Nations, IMF and Treasury.

Again, a longer-term perspective also supports the view that China's urbanisation convergence is far from complete. Three hundred years ago most of the world's population lived in rural areas. The urbanisation rate started to increase at the start of the 19th century in Western Europe, accelerating in the first half of the 20th century, before starting to plateau in the second half of the 20th century, with Japan following a similar, but more muted, pattern before an acceleration in urbanisation coincided with its economic take-off from the 1950s to the 1980s (Chart 7).

In contrast, China's increased urbanisation has occurred more rapidly. China's urbanisation rate in 1900 of around 4.5 per cent was about the same as that in 1700 (4 per cent). While the urbanisation rate had increased to 12 per cent by 1950, this was similar to the rate that Western Europe and Japan had achieved by 1800. The urbanisation rate in China has more than doubled since economic reforms began in the late 1970s (Chart 7).

Chart 7: Urbanisation rate



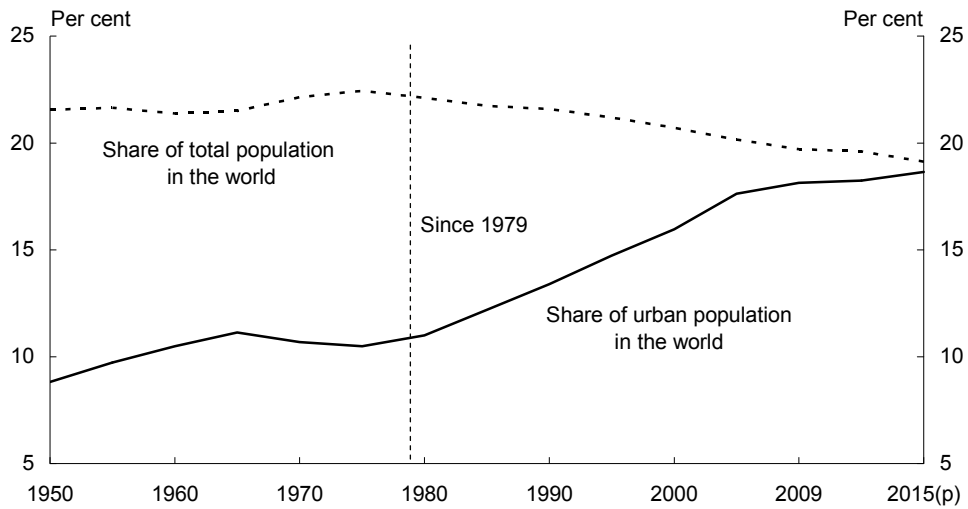
Note: Europe is Western Europe.

Source: United Nations, Maddison 2007 and Treasury.

The combination of China's large population and its growing urbanisation means that China has the world's largest urban population, with over 630 million urban citizens today.

While China's share of the world's population is decreasing, its share of the world's urban population is increasing (Chart 8). China's share of the world's total population has fallen from 22 per cent in 1980 to around 20 per cent today, its share of the world's urban population has risen from 11 per cent to 18 per cent over the same period. By 2050 China's share of the world's total population is projected to drop by a further 5 percentage points to 15 per cent, but its share of the world's urban population is projected to fall only slightly to 17 per cent (United Nations 2010).

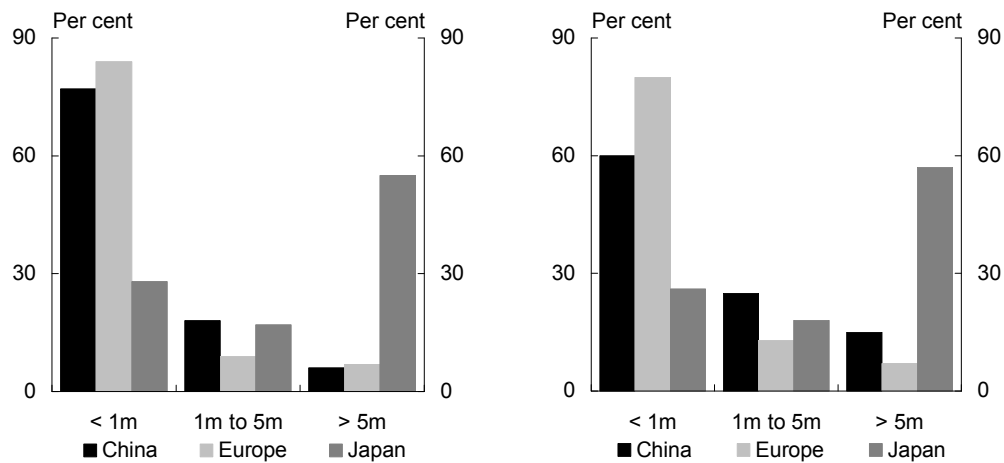
Chart 8: China's share of urban and total population in the world



Source: United Nations and Treasury.

China's urbanisation has also seen a shift in the average size of its cities, as well as their number. In 1980, 77 per cent of China's urban population lived in cities with a population of less than 1 million people with only 6 per cent in cities of more than 5 million people. By 2015, the proportion of the urban population living in cities of more than 5 million people in China is projected to more than double to 15 per cent, with the proportion in cities of less than 1 million people falling to 60 per cent (Chart 9).

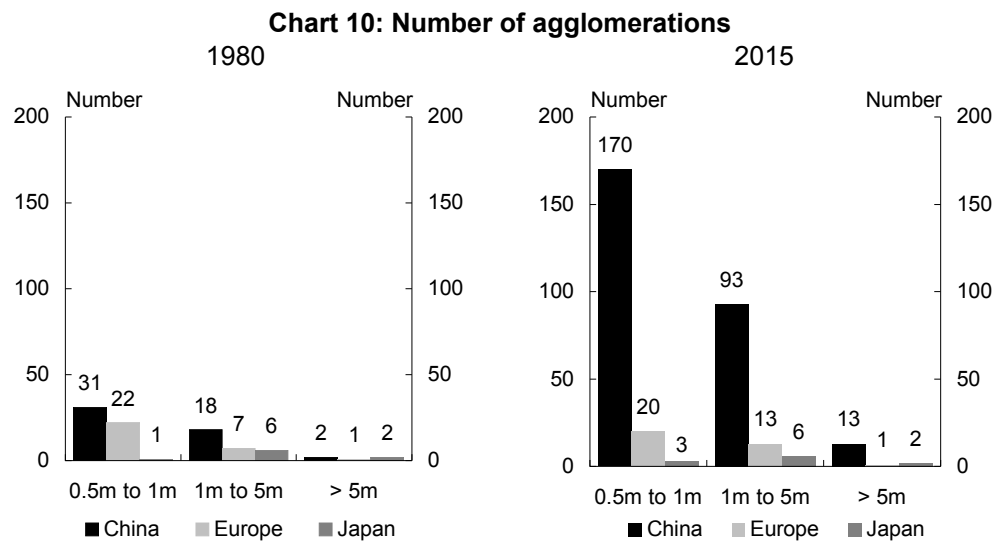
Chart 9: Share of urban population by sized-cities
1980 2015



Note: Europe is Western Europe. m is million.
Source: United Nations and Treasury.

China: growth, urbanisation and mineral resource demand

In addition, from 1980 to 2015 the number of cities in China is projected to increase more than five-fold, compared to the two-fold increase over this period for the world as a whole (Chart 10). One third of the growth in cities in the world over this period is projected to be in China. By 2015, China is projected to have 106 cities with more than one million people.



Note: Europe is Western Europe. m is million. Data on cities with less than 500,000 people are not available.
Source: United Nations and Treasury.

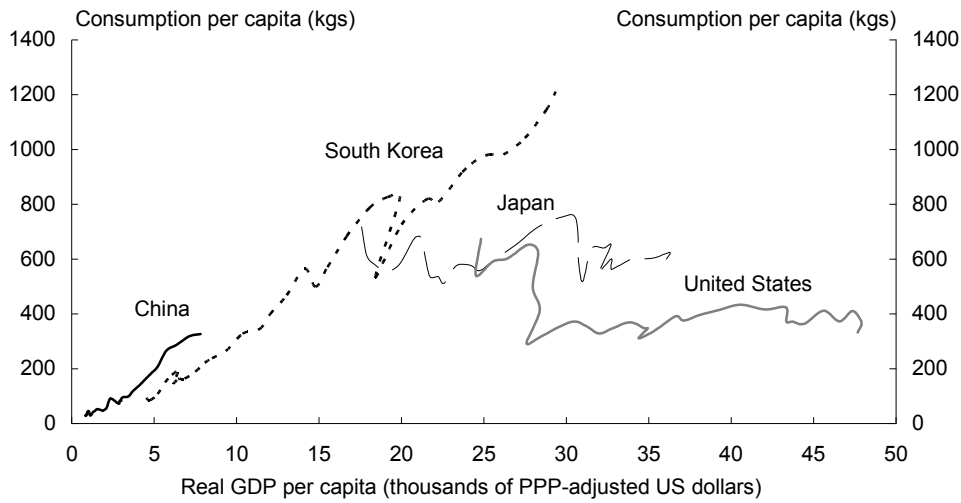
China's demand for mineral resources

China's economic and urbanisation convergence has had a significant impact on its demand for mineral resources.

The consumption of metals typically grows together with income until real GDP per capita reaches about \$15,000–\$20,000 per capita in 2005 purchasing power parity adjusted US dollars, as countries go through a period of industrialisation and infrastructure construction (IMF 2006).

Chart 11 shows the relationship between steel consumption per capita and real GDP per capita for selected countries. While China's steel consumption has increased sharply over recent decades, in line with its rapid economic convergence, it is still a considerable distance from the point where further increases in GDP per capita no longer increase steel consumption per person. This suggests that should China's economic and urbanisation convergence continue at its current pace, it is likely to continue to add significantly to global demand for steel for some time to come.

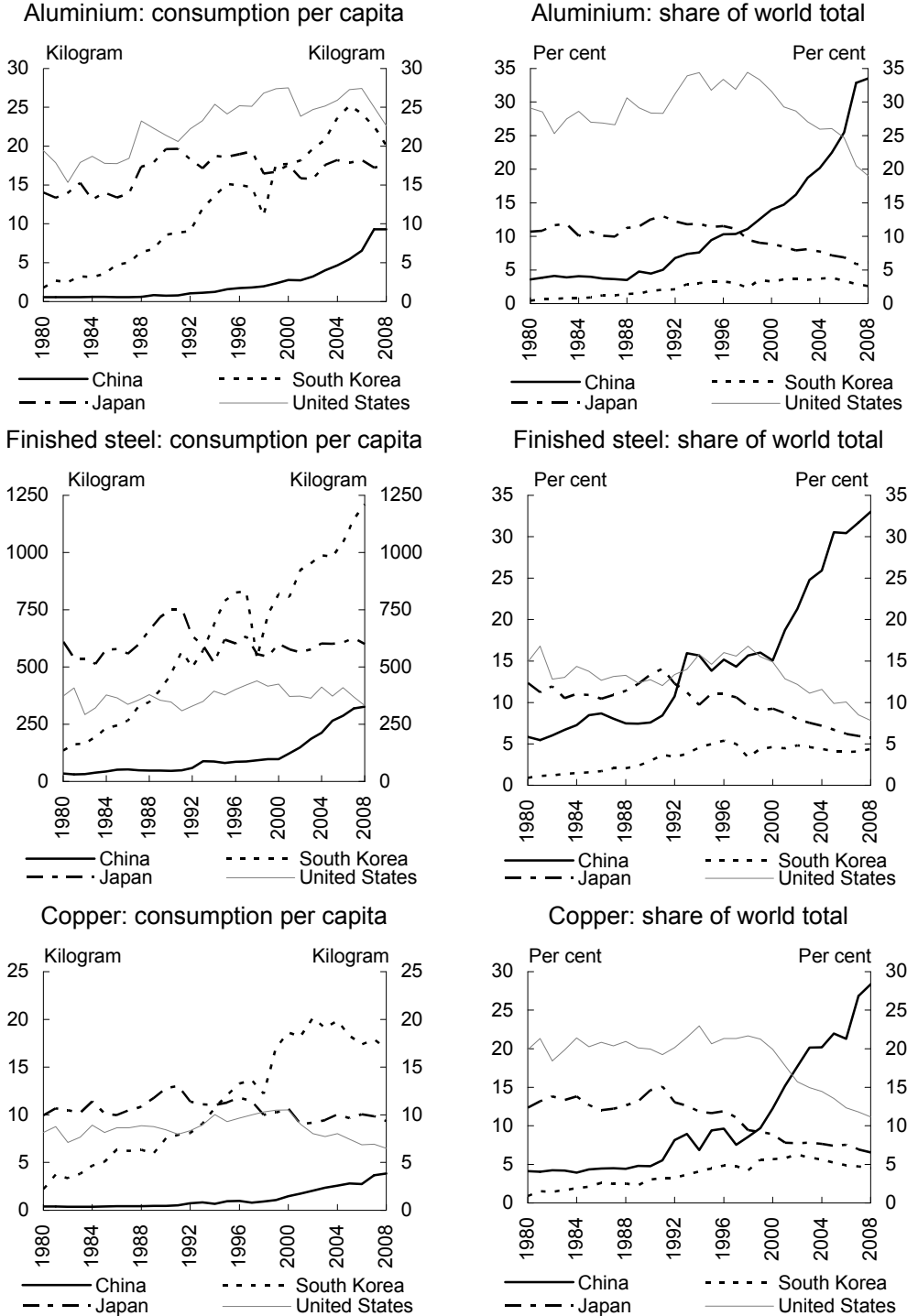
Chart 11: Steel consumption per capita vs real GDP per capita, 1974-2008



Source: IMF, The Conference Board Total Economy Database, Steel Statistical Yearbooks and Treasury.

The increase in China's demand for mineral resources associated with its urbanisation and industrialisation, combined with the sheer size of its population, has meant that China has been the dominant contributor to growth in mineral resource demand over the past decade. Despite its per capita consumption of mineral commodities still being relatively low compared with advanced economies, China is now the largest market in the world for aluminium, steel and copper (Chart 12).

Chart 12: Aluminium, finished steel and copper consumption



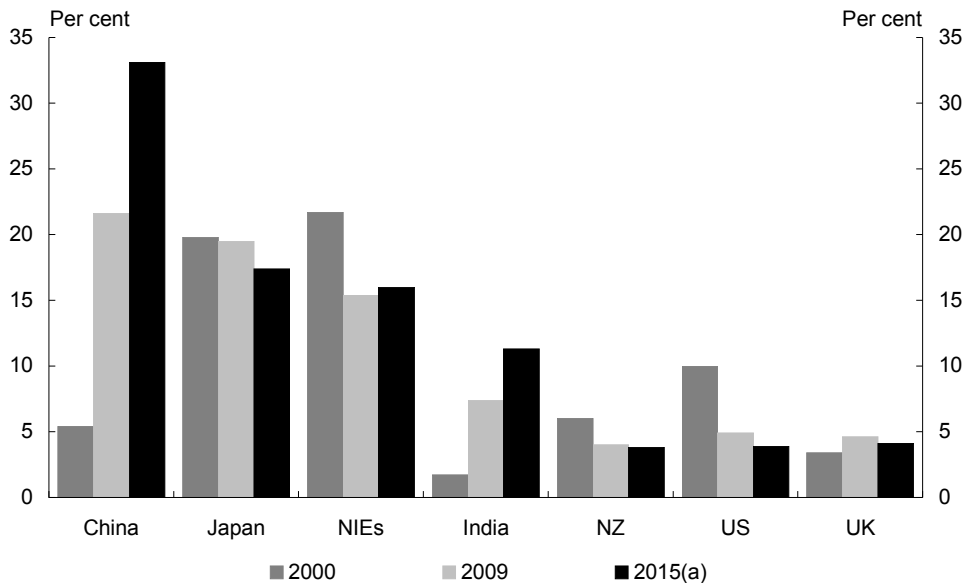
Source: ABARE, Steel Statistics Yearbooks and Australian Government (2010).

Implications for Australia

Australia has an abundance of mineral resources. For many minerals, Australia's resource reserves rank highly by world standards and their indicative life is considerable (Australian Government 2010). This means that the boost to global demand for mineral resources from China's economic and urbanisation convergence has significant implications for Australia.

The surge in global demand for mineral resources over the past decade, driven in particular by demand from China, has resulted in strong growth in world prices for these resources (Grant et al 2005). The growing importance of China's demand for mineral resources is also reflected in it becoming an increasingly important destination for Australia's exports. Over the past decade, China's share of Australia's merchandise exports increased more than four-fold, from 5 per cent to over 20 per cent (Chart 13). The IMF projects that by 2015 China will receive around one third of Australia's merchandise exports (Sun 2010).

Chart 13: Australia's merchandise export destinations



Note: (a) is projection. NIEs include South Korea, Taiwan, Singapore and Hong Kong.
Source: Sun 2010, ABS cat. no. 5432.0 and Treasury.

The potential for further economic and urbanisation convergence in China, along with prospect of strong growth in other large emerging and developing economies, suggest that global demand for Australia's mineral resources is likely to continue to grow strongly over coming decades.

China: growth, urbanisation and mineral resource demand

This creates an opportunity for an improvement in the wellbeing of all Australians. With these opportunities, however, come a number of challenges for the economy. Statement 4 of the 2010-11 Budget discussed these challenges and optimal policy responses in detail. It concluded that with sound policy settings, particularly directed at the flexible and efficient allocation of labour and capital, continued strong demand for Australia's mineral resources will increase national income and allow a better distribution of the benefits of resource wealth across the community (Australian Government 2010).

Conclusion

Over recent decades, China has experienced rapid economic growth and a related sharp increase in its rate of urbanisation. The speed of this transition, along with the sheer size of China's population, has resulted in China being an increasingly significant driver of global growth and mineral resource demand over the past decade.

There are good reasons to believe that the convergence of China's level of economic activity and urbanisation with those of more developed countries is far from complete, and that China will therefore continue to be a major source of demand for mineral resources for some time to come.

References

Australian Government 2010, Statement 4, Benefiting from our Mineral Resources: Opportunities, Challenges and Policy Settings, Budget Paper No. 1, *Budget Strategy and Outlook 2010-11*.

Cai, F 2003, 'Removing the barriers to labor mobility: labor market development and its attendant reforms', paper presented at the World Bank Workshop on National Market Integration in China, Beijing.

Commission on Growth and Development, 2009, *Urbanisation and Growth*, edited by Spence, M, Annez, P and Buckley, R, The World Bank, Washington.

Garnaut, R 2006, 'The China resources boom', the paper presented at the Australian Agriculture and Resource Economics Conference, Sydney, 8-10th February 2006.

Grant, A, Hawkins, J and Shaw, L 2005, 'Mining and commodities exports', *Economic Roundup*, Spring edition, pp 1-15.

IMF 2006, *World Economic Outlook*, September, International Monetary Fund.

IMF 2010, *World Economic Outlook*, April, International Monetary Fund.

Maddison, A 2007, *Contours of the World Economy, 1-2030 AD*, Essays in Macro-Economic History, Oxford University Press, New York.

Sun, Y 2010, 'Potential growth of Australia and New Zealand in the aftermath of the global crisis', IMF Working Paper, WP/10/127, International Monetary Fund.

United Nations 2007, *World Urbanization Prospects: the 2007 Revision*, Department of Economic and Social Affairs/Population Division, New York.

United Nations 2010, *The 2009 Revision Population Database*, Department of Economic and Social Affairs/Population Division, New York.

Zhang, K and Song, S 2003, 'Rural-urban migration and urbanisation in China: Evidence from time-series and cross-section analyses', *China Economic Review*, no. 14, pp 386- 400.

Zhang, Y and Zheng, C 2008, 'The implications of China's rapid growth on demand for energy and mining products imported from Australia', *Economic papers* vol. 27, no. 1, pp 95-106.

