

Bowman, Scott; Conway, Patrick

Working Paper

The Outlook for China's Growth and its Impact on New Zealand Exports

New Zealand Treasury Working Paper, No. 13/16

Provided in Cooperation with:

The Treasury, New Zealand Government

Suggested Citation: Bowman, Scott; Conway, Patrick (2013) : The Outlook for China's Growth and its Impact on New Zealand Exports, New Zealand Treasury Working Paper, No. 13/16, ISBN 978-0-478-40360-2, New Zealand Government, The Treasury, Wellington

This Version is available at:

<https://hdl.handle.net/10419/205640>

Standard-Nutzungsbedingungen:

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

Terms of use:

Documents in EconStor may be saved and copied for your personal and scholarly purposes.

You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.

If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.



<https://creativecommons.org/licenses/by/4.0/>

The Outlook for China's Growth and its Impact on New Zealand Exports

Scott Bowman and Patrick Conway

New Zealand Treasury Working Paper 13/16

July 2013



**NZ TREASURY WORKING
PAPER 13/16**

The Outlook for China's Growth and its Impact on New Zealand
Exports

MONTH/YEAR

July 2013

AUTHORS

Scott Bowman
NZ Treasury
1 The Terrace
PO Box 3724
Wellington 6008
New Zealand]
Email scott.bowman@treasury.govt.nz
Telephone 64 4 917 6024

Patrick Conway*
NZ Treasury
1 The Terrace
PO Box 3724
Wellington 6008
New Zealand]
Email patrick.conway@treasury.govt.nz
Telephone 64 4 917 6957
* corresponding author

ISBN (ONLINE)

978-0-478-40360-2

URL

Treasury website at July 2013:
<http://www.treasury.govt.nz/publications/research-policy/wp/2013/13-16>
Persistent URL: <http://purl.oclc.org/nzt/p-1578>

ACKNOWLEDGEMENTS

We would like to thank Paul Conway, Jason Young, Wei Zhang, Lee McCauley, Steve Cantwell, Bob Buckle and Simon McLoughlin for their helpful comments, as well as many colleagues at the New Zealand Treasury and Reserve Bank of New Zealand who commented on earlier drafts of this paper.
All errors and omissions remain our own.

NZ TREASURY

New Zealand Treasury
PO Box 3724
Wellington 6008
NEW ZEALAND
Email information@treasury.govt.nz
Telephone 64-4-472 2733
Website www.treasury.govt.nz

DISCLAIMER

The views, opinions, findings, and conclusions or recommendations expressed in this Working Paper are strictly those of the author(s). They do not necessarily reflect the views of the New Zealand Treasury or the New Zealand Government. The New Zealand Treasury and the New Zealand Government take no responsibility for any errors or omissions in, or for the correctness of, the information contained in these working papers. The paper is presented not as policy, but with a view to inform and stimulate wider debate.

Abstract

The People's Republic of China has become increasingly important to the New Zealand economy since the start of economic liberalisation in China more than 30 years ago, particularly in the past decade. This paper is the second of three looking at the impact of China on the New Zealand economy. The first paper (Bowman and Conway, 2013) examined China's recent economic expansion and traced the channels through which this expansion has impacted on the New Zealand economy, concentrating on China's demand for commodities. This paper examines the sustainability of China's economic growth and demand for commodities, and the impact that China is likely to have on the New Zealand economy in the next decade. The third paper (Osborn and Vehbi, 2013) quantifies the impact of China's past expansion and commodity demand on the New Zealand economy through the framework of an econometric model.

This paper concludes that while there are cyclical risks to China's economic performance in the medium term, these risks are manageable; China's economic growth is likely to ease to a more stable and sustainable rate over the next decade compared to the previous decade. However, demand for commodities is likely to remain high over this period, as urbanisation continues and incomes grow faster than other trading partners. A gradual shift in the driver of economic growth from investment to consumption is likely to transfer demand from hard to soft commodities.

Dairy and meat consumption per capita are expected to grow as incomes increase and combined with China's large population will result in significant impacts on global markets. China's shortage of agricultural land and water resources will limit its supply response and, along with concerns about the quality of domestic production, result in a reliance on imports of agricultural products. New Zealand's reputation for producing quality products and its efficient supply chains, which are already well established, put it in a good position to benefit. China's growing share of New Zealand exports will continue to increase its contribution to New Zealand's economic growth, despite a slowdown in China's growth.

JEL CLASSIFICATION

F14 – Country and Industry Studies of Trade
F43 – Economic Growth of Open Economies

KEYWORDS

China; New Zealand;; commodities; dairy; forestry; merchandise trade

Table of Contents

Abstract	i
1 Introduction	1
1.1 Background: debate on China's growth prospects	1
1.2 Related papers and outline	1
2 The outlook for China's economic growth	2
2.1 Wage growth likely to erode competitiveness	2
2.2 Credit growth and quality a manageable risk	4
2.3 Population growth to slow	6
2.4 Growth likely to slow with rebalancing and income convergence	8
2.5 Consumption to continue growing strongly.....	14
3 Outlook for China's impact on New Zealand	15
3.1 China's continuing growth will have benefits for New Zealand	15
3.2 China's commodity imports will continue to rise	16
3.3 Increased demand for dairy products	19
3.4 China's demand for forestry products to increase	22
3.5 China's demand for services imports likely to grow	24
3.6 China's large impact to continue despite slowing growth and risks	24
4 Conclusions	26
5 Bibliography	27

List of Figures

Figure 1 – China's labour costs.....	2
Figure 2 – China's credit growth	4
Figure 3 – China population projections and demographic changes.....	7
Figure 4 – Investment as a share of GDP	10
Figure 5 – Indicators of agricultural imports	17
Figure 6 – Dairy consumption vs GDP	19
Figure 7 – Dairy consumption per capita	20
Figure 8 – Dairy consumption per capita	21

The Outlook for China's Growth and its Impact on New Zealand Exports

1 Introduction

1.1 Background: debate on China's growth prospects

There is a range of views amongst analysts and forecasters about the sustainability of China's growth and the impact that it will have on the rest of the world. Developments in China are vital to the performance of the world economy, with China expected to become the world's largest economy by the mid-2020s, and important for New Zealand as China is its second largest trading partner. Much has been written on the drivers and sustainability of China's recent high growth rate and its impact on the Australian and New Zealand economies.¹ This paper addresses the outlook for China's growth and its potential impact on the demand for commodities and the New Zealand economy in the next decade.

1.2 Related papers and outline

This paper follows Bowman and Conway (2013) which looked at the recent economic performance of China and its flow-on impact on the New Zealand economy. In another Treasury Working Paper, Osborn and Vehbi (2013) quantify the impact of China's growth on the New Zealand economy in the recent period through the framework of an econometric model. The purpose of this paper is to discuss the outlook for the Chinese economy and how it will impact on the New Zealand economy, concentrating mainly on the demand for primary commodities. The paper is more concerned with medium- to long-term developments and structural issues than with short-term fluctuations and risks, while acknowledging that they may affect longer-term outturns.

The paper is organised as follows. Section 2 discusses the outlook for China's economic growth over the medium to long term, while Section 3 examines the outlook for China's impact on the New Zealand economy. The final section draws some general conclusions.

¹ See the discussion and references in section 1.2 of Bowman and Conway (2013).

2 The outlook for China's economic growth

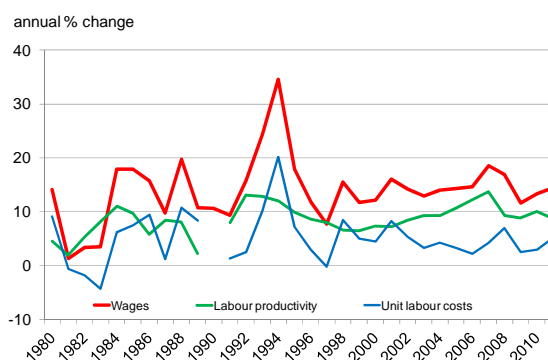
In this section we discuss the outlook for China's economic growth in the next decade, concentrating on structural developments and risks. The first two sub-sections are concerned with medium-term risks to China's growth (loss of competitiveness and high debt levels), while the final two are concerned with the long-term sustainability of China's growth (slowing population growth and slowing economic growth with rebalancing and income convergence).²

We conclude that there are risks to China's growth in the medium term, although we consider that these are manageable, but that China's growth rate is likely to slow in the longer term as a result of structural factors while remaining high by advanced economy standards. We do not discuss short-term risks and external threats to China's growth such as the recovery of the rest of the world economy from the global financial crisis and the European debt crisis.³ These represent cyclical rather than structural factors.

2.1 Wage growth likely to erode competitiveness

Annual nominal wage growth has averaged just below 15% for the past decade (Figure 1), much higher than inflation of 2.6%. Minimum wages increased by an average of 22% in 2010 and 2011, but smaller increases were recorded in 2012.⁴ The Five Year Plan to 2015 calls for minimum wage increases of at least 13% per annum, to reach 40% of the average wage. This comes after an average annual increase of 12.5% between 2006 and 2010.⁵ Wages in export-focused coastal regions were reported to have increased by 10% from a year ago in early 2012. Labour unrest in some coastal factories in 2010 pointed to increasing wage pressures and possibly a shift in the balance in the labour market from employers to employees, suggesting that labour supply was becoming more restricted.

Figure 1 – China's labour costs



Source: Haver Analytics, IMF (2013)

Some commentators consider that China is approaching its Lewis Turning Point, when the supply of unskilled labour begins to run out and wage growth accelerates.⁶ Incremental demand for unskilled labour is currently outstripping demand for skilled workers, evidenced by the large increases in minimum wages and reports of graduates having difficulty finding jobs, but with a rural/urban population split still close to 50/50, there

² In its 2012 Article IV Consultation, the IMF identified the main domestic risks to the outlook for China's economy to be the property sector, financial system and local government finances (IMF, 2012b). For a discussion of the impact of a downturn in residential investment (not discussed in this paper), see Ahuja and Myrvoda (2012).

³ For a discussion of the possible impact of the euro area debt crisis on Asia including China, see Chapter 3 of IMF (2012a).

⁴ Financial Times <http://www.ft.com/intl/cms/s/0/847b0990-36a2-11e1-9ca3-00144feabdc0.html#axzz1xXUtABek> and China Daily http://www.chinadaily.com.cn/bizchina/2012-07/16/content_15585732.htm

⁵ Reuters: <http://www.reuters.com/article/2012/02/08/us-china-economy-jobs-idUSTRE8170DY20120208>

⁶ Lewis (1954).

appears to be ample supply of unskilled labour. This indicates that despite rising real wages, China is approaching but has not yet reached its Lewis Turning Point which would be marked by a more constrained supply of labour and even faster wage growth.⁷

However, rising real wages still pose a threat to competitiveness and so could retard China's export-led growth. That would occur only to the extent that the wage growth is not supported by productivity growth (ie, to the extent that unit labour costs are rising); China's labour productivity growth has averaged around 10% per annum in the past decade, as we saw in section 2 of the accompanying paper (Bowman and Conway, 2013), but nominal wage growth in that period exceeded that. As a result, unit labour costs have increased by around 5% per annum over the past decade, posing a threat to international competitiveness (Figure 1).⁸

The impact of any loss of cost advantage will depend on the extent of that margin. China may already be losing ground to lower-cost producers in some countries (eg, Vietnam) and higher wage inflation will hasten that process. So far, overseas investors and buyers have generally remained loyal to China because of the size and quality of the labour force (eg, skill levels), the agglomeration effects of having so many factories close together (giving more reliable supply chains), and the fact that there is already infrastructure in place (eg, ports), even if it needs to be extended in some areas. China is also able to shift production inland where labour is more abundant and cheaper. A shift to less price-sensitive products would also help offset rising labour costs.

Faster wage growth is not necessarily a threat to China's development as higher household incomes would boost private consumption and help with the rebalancing of the economy away from its dependence on exports and investment. In fact, this is part of the strategy of the current Five Year Plan, but it will take a long time for private consumption growth to replace exports and investment as the main driver of growth, even with a move towards a larger services component in the economy.

We consider that the high wage growth is likely to be positive for the rebalancing of the economy away from dependence on investment and exports and towards increased reliance on consumption; it will also support the demand for higher-value food products and materials for housing construction as people's real incomes rise, benefiting New Zealand. It may bring some loss of competitiveness and market share for China in its export markets, but this can be offset to some degree by productivity growth and utilising cheaper labour from the rural hinterland.

Higher wage growth may, however, bring an end to the deflationary pressure which developed economies have experienced over the past decade as prices of their imports from China stop falling and begin to increase, particularly if combined with an appreciation of China's currency. As we saw in section 3.3 of the accompanying paper (Bowman and Conway, 2013), this is one of the benefits New Zealand has derived from its closer trade links with China.

⁷ The IMF considers that China is likely to reach the Lewis Turning Point sometime between 2020 and 2025 (IMF (2012b) p.8). See also Das and N'Diaye (2013).

⁸ High nominal wage growth and unit labour cost growth in 1994 reflected consumer price inflation of 24% in that year.

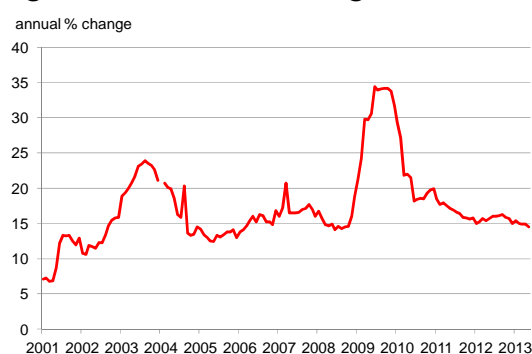
2.2 Credit growth and quality a manageable risk

This sub-section discusses the medium-term risks arising from the rapid expansion of credit in China in 2009 and 2010 and looks more specifically at central and local government debt. It recognises that the rate of credit growth may be explained in terms of China's stage of development and institutional factors, but it may still pose a risk to the financial sector and the government. Total government debt is higher than official figures suggest, but bad debts could be absorbed by central government without raising debt ratios to unsustainable levels.

2.2.1 Rapid economy-wide credit growth

China experienced annual credit growth of 30% in 2009 and 20% in 2010 (Figure 2); it is estimated that this increased outstanding credit to around 180% of GDP from less than 150% prior to the global financial crisis (GFC).⁹ This credit expansion was part of the government's stimulus package launched in November 2008 in response to the GFC and which funded an investment boom.¹⁰ Much of the credit was extended by banks to local government investment corporations for infrastructure projects as local governments are not permitted to borrow.

Figure 2 – China's credit growth



Source: Haver Analytics

The high credit growth in 2009 and 2010 followed a period in which credit grew at about the same rate as GDP; annual credit growth averaged 15.6% between 2004 and 2008 while nominal GDP growth averaged 18.0% per annum in that period. There is a concern that the rapid growth in 2009 and 2010 led to an increase in bad debts, threatening the stability of the banking system and leading to a slowdown in investment and GDP growth. Although this risk has not eventuated yet, it could be exposed by an economic slowdown or weakness in the housing market. By mid-2012, credit growth had declined to the target of about half its rate of growth in 2009, but Fitch estimate that outstanding credit stood at 200% of GDP in 2012, partly through expansion of the shadow banking sector.¹¹

The level of credit outstanding in China is high relative to other emerging economies (eg, 51% for India, 59% for Brazil) and more than the US (108%). This difference is usually explained as a result of the underdevelopment of capital markets for corporate investment in China and is related to the dominance of banks in the financial system, combined with high household and corporate saving rates. More than half of private wealth is held in bank deposits. While the level of credit relative to GDP can be partly explained by the stage of development of the financial system and the economy, the rapid growth in credit in 2009 and 2010 and subsequently poses a risk to credit quality and financial stability.

⁹ Fitch (2011).

¹⁰ For an account of China's macroeconomic response to the crisis, see McKissack and Xu (2011).

¹¹ <http://www.telegraph.co.uk/finance/china-business/10123507/Fitch-says-China-credit-bubble-unprecedented-in-modern-world-history.html> and <http://www.bloomberg.com/news/2013-06-18/china-banking-stress-may-come-faster-on-cash-crunch-fitch-says.html>

The issue of credit quality is compounded by an increase in informal securitisation of debt in the Chinese financial system. Lending growth may not have slowed recently as much as official figures suggest, as there has been an increase in credit being shifted off bank balance sheets through informal securitisation. Fitch points out that most of these transactions are not disclosed, resulting in an understatement of credit growth and exposure.¹² As a result, Chinese banks' loan loss reserves and capital are much more exposed to potential credit losses than official data suggest.

Other issues associated with the rise in informal securitisation are that it does not fall under the control of the authorities, but any extension of regulation could be negative for growth in the short term as there is clearly a demand for both the credit and the investment products. If the credit were brought back onto bank balance sheets, the banks would need more capital. There have been moves to bring some of this off-balance sheet credit under regulatory control, but it is not known how successful these efforts have been.

The International Monetary Fund (IMF) considers that, given the large expansion in credit recently, China's banking system would be exposed if a number of shocks all occurred at the same time (eg, lower growth, a sharp fall in real estate prices and higher interest rates). Smaller banks with insufficient capital to meet regulatory requirements would be particularly at risk. The IMF considers that the three main areas of risk to credit quality are loans to local government financing vehicles, off-balance sheet lending and lending to the property sector.¹³

2.2.2 High central and local government debt

A closely related issue is the level of outstanding government debt in China. The official figure for general government debt (ie, central plus local government) peaked at the end of 2010 at RMB13.5 trillion (33.5% of GDP);¹⁴ most commentators take this figure as including only central government debt.¹⁵ Estimates for total government debt (ie, including local government debt) at the end of 2010 are much higher than this; in June 2011, two sets of figures were released ranging from RMB10.7 trillion (26.9% of GDP) from China's National Audit Office (NAO) to RMB14.4 trillion (36.2% of GDP) from the People's Bank of China (PBoC); the difference between these figures may reflect different definitions of local government debt. An earlier figure from the China Banking Regulatory Commission put local government debt at RMB9.1 trillion in late 2010 (22.9% of GDP). Moody's have estimated that the local government debt figure is approximately one third higher than the NAO figure (an additional RMB3.5 trillion), taking the figure closer to the PBoC figure of RMB14.4 trillion.¹⁶

The NAO figure was accompanied by a breakdown of the debt: 24% was set to mature in 2011 and 70% over the next five years; 2% of the debt was in arrears and 5% had been rolled over using bank loans; more than 90% of the debt was created in 2009 and 2010 as part of the infrastructure stimulus. Nearly 80% of the total was funded by bank loans and

¹² Fitch (2010) and (2011).

¹³ IMF (2011a) and (2012b). The IMF also expressed these concerns in its Financial System Stability Assessment of China (IMF 2011b).

¹⁴ IMF (2013). The 2010 figure was up sharply from RMB6.0 trillion (17.7% of GDP) in 2009, but declined to RMB12.0 trillion (25.5% of GDP) at the end of 2011 and RMB11.9 trillion (22.8% of GDP) in 2012.

¹⁵ Strictly, local governments are not permitted to issue debt, but they have done so by setting up separate entities. In October 2011, the State Council approved debt issuance on a pilot basis for four local governments. This arrangement was extended to two more provinces in mid-2013.

¹⁶ Reported in the Financial Times, 5 July 2011, <http://ftalphaville.ft.com/blog/2011/07/05/613441/the-great-wall-of-chinese-worry/>.

approximately half of it (RMB5 trillion) was extended to Urban Development Investment Vehicles and was used mainly to finance social infrastructure projects.

If the official figure refers only to central government debt and if we adopt the NAO figure for local government debt, total gross government debt was around 60% of GDP at the end of 2010. McKissack and Xu (2011) estimate total government debt to be in the range of 60-70% of GDP. Some estimates of total public debt, including non-performing loans of the banks and central bank bills, put the figure at around 80% of GDP.¹⁷

It was also reported in June 2011 that authorities plan to shift RMB2-3 trillion off local governments' balance sheets through write-downs by the banks concerned, repayment of loans directly by central government or the creation of asset management companies to handle bad debts. The last approach was used in the late 1990s when the government set up such structures to handle the bad debts from a previous banking crisis. These organisations are reported to have had low debt recovery rates.¹⁸

Some reports suggest that one-quarter to one-third of local government loans may fail to generate a financial return.¹⁹ If local government debt amounts to 27% of GDP (the NAO figure and the middle one of the three estimates), the bad debts of the local government sector are likely to amount to around 7-9% of GDP. While not insubstantial, such a cost could be taken on by central government, bearing in mind that not all of the debt would have to be absorbed by the government. Some of it would be recoverable, leaving possibly 5% of GDP to be taken on by the central government. In the context of gross debt of around 23% of GDP at the end of 2012, such an amount would be manageable for the central government, but anything significantly above that level would have a more serious impact.

The mitigating factors in relation to China's public debt are that the debt is held domestically, resulting in less exposure to international financial markets, and the debt has mostly been applied to fund infrastructure projects which should yield some return in the future (even if a social return), whereas some other governments' debt has been applied to social programmes or defence, which will not produce a similar economic benefit. While excessive credit growth does pose a risk to the banking system in China, the government would be able to absorb an increase in bad debts of around 5% of GDP arising mainly from the local government sector as part of its 2009-2010 stimulus package. However, the impact on the banking sector, and ultimately on the government's debt level, would depend on the proportion of non-performing loans. As elsewhere, a sharp slowdown in growth would exacerbate any debt problems.

2.3 Population growth to slow

Economic growth in China is likely to be lower in coming years as demographic changes occur. China's population growth rate has slowed from more than 2% per annum in the 1970s to around 0.5% currently, chiefly as a result of the one-child policy. The United Nations (UN) projects China's total population to increase from 1.34 billion in 2010 to a peak of just fewer than 1.4 billion in 2025 and to decline to 1.3 billion by mid-century

¹⁷ GaveKalDragonomics, quoted in *The Economist*, 2 June 2011, *China faces up to the hidden debts of its local governments*.

¹⁸ Roubini Global Economics (2011).

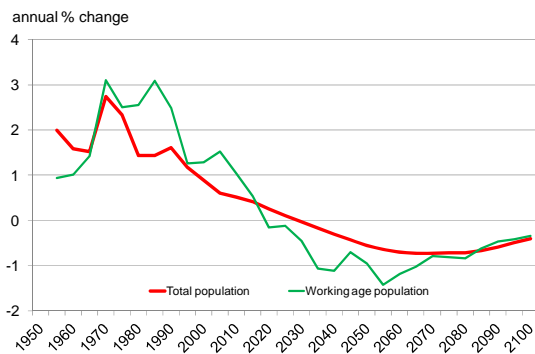
¹⁹ *The Economist*, 2 June 2011, quotes a figure of 28% from a Chinese newspaper. It is consistent with the reports that the authorities are considering moving RMB2-3 trillion of debt off local governments' balance sheets.

(Figure 3.1).²⁰ The main driver of the decline is a fall in the projected birth rate which is expected to continue to decline from 12.6 births per 1,000 people in the 2006-2010 period, troughing below nine mid-century before picking up slightly to 10.5 by the end of the 21st century. The declining birth rate is offset to some degree by increasing life expectancy, rising from around 73 years currently to 79 years mid-century (Figure 3.2). China's declining birth rate and rising life expectancy will also bring a decline in the working age population (15-64 years).²¹

The UN estimates that as a result of these changes, China's age dependency ratio (the proportion of the population not in the working-age population), which fell steadily from 48% in 2000 to 39% in 2010, will rise to 46% in 2025. The rate of growth in the working-age population has already slowed from around 3% per annum in the mid-1980s to around 1% per annum currently. The total working-age population is projected to grow from 970 million in 2010, peaking in 2015 at 996 million before declining to 789 million by mid-century. Slowing growth, and subsequent decline, in the working-age population on its own will bring a lower potential growth rate for the economy unless it is offset by a higher rate of labour productivity growth and/or labour force participation. The changing age composition of the workforce with fewer younger, more productive workers may reduce labour quality and productivity, further constraining growth.

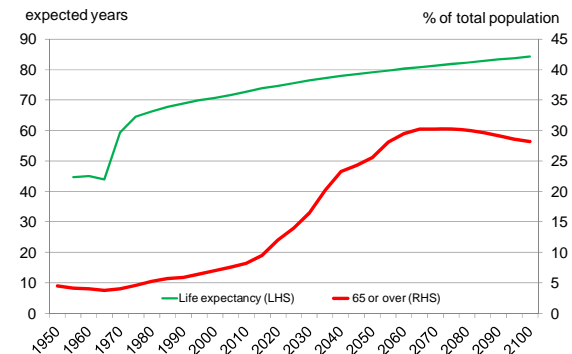
Figure 3 – China population projections and demographic changes

Figure 3.1: China population projections



Source: United Nations

Figure 3.2: China demographic changes



Source: United Nations

Increasing life expectancy and a changing age profile will lead to a rise in the median age from 35 years currently to a peak of just less than 50 years mid-century before declining to 46 years by the end of the century. It will also lead to an increase in the proportion of the population aged 65 years and older from 8.2% in 2010 to more than 30% by 2065. While demographic changes will be a negative influence on China's aggregate growth rate, they may also have a positive effect on the composition of growth. The gradual rise in the old-age dependent proportion of the population is likely to lead to a decline in the saving rate as those people draw on their life savings in retirement. A lower saving rate may raise the cost of capital, constraining investment, but it may also assist the rebalancing of the economy from investment towards consumption.

Increasing urbanisation of China's population is likely to support the rebalancing of the economy. As discussed in Bowman and Conway (2013),²² China's official urbanisation rate exceeded 50% for the first time in 2011. The official urbanisation rate, which is based

²⁰ United Nations population projections, http://esa.un.org/unpd/wpp/unpp/Panel_profiles.htm

²¹ China's working age population, defined as 15-59 years, has already declined by 3.5 million in 2012.

²² Bowman and Conway (2013), section 2.1.2. p.8.

on those who have lived in an urban area for more than six months during the calendar year, includes an estimated 15% of the population who live and work in cities but do not qualify as urbanised under the *hukou* (household registration) system; these people contribute to the industrial economy, but because they do not have security of urban residence their consumption patterns are likely to reflect rural households rather than urban ones.

Reform of the *hukou* system is widely acknowledged as a priority and when it occurs the people affected will contribute more to consumption as the benefits of social welfare schemes are extended to them, without changing the urbanisation rate. This will also contribute to rebalancing of the economy. In addition, Citigroup (2012) estimates that a further 150 million surplus rural workers will migrate to the cities by 2030, taking the urbanisation rate to 70-75% and lifting China's potential growth rate 0.8 percentage points to 8.5% in 2015 and 1.6 percentage points to 7.1% in 2020 from what it would otherwise be. Ongoing urbanisation of the population (in terms of both a change in status under the *hukou* system and actual migration from the countryside) will require continuing infrastructure investment (eg, housing, transportation networks) and will boost private consumption growth, especially for the high-protein, western-style foods which New Zealand exports.

2.4 Growth likely to slow with rebalancing and income convergence

In this section we discuss three arguments related to the sustainability of China's growth: whether investment- and export-led growth is sustainable; the parallels between China today and Japan in the 1980s; and whether China's growth is likely to slow as its per capita income converges with more developed economies. We conclude that China's growth rate is likely to slow as the economy rebalances and incomes converge, but that it is unlikely to fall sharply or undergo a protracted period of low growth and that it will remain high relative to advanced economies.

2.4.1 Investment and export growth to slow

There is considerable debate about the sustainability of China's investment-led growth.²³ Economic settings in China favour investment over consumption with the provision of cheap credit to corporates (encouraging investment), high returns to capital relative to labour (ie, high profitability vs. low wages) and under-developed financial markets which make it difficult for households to borrow for consumption. The relatively low exchange rate²⁴ also favours the export sector over domestic consumption by making exports cheaper in foreign currency terms and imports more expensive in domestic currency; in addition, the absence of a social safety net and low provision of state-funded health and education services encourage saving at the expense of consumption.²⁵ By liberalising

²³ Some commentators, eg, Michael Pettis, consider that China's growth model is not sustainable and that the transition to increased reliance on consumption is unlikely to be smooth (<http://mpettis.com/>). The IMF, on the other hand, projects real GDP growth of 8.0-8.5% per annum for the next five years with investment steady at around 47% of GDP (IMF, 2013). Lee *et al.* (2012) examine China's level of investment and whether it is sustainable.

²⁴ The IMF considers that the renminbi is moderately undervalued against a broad basket of currencies (IMF, 2012b, p.20). It maintained this assessment in its 2013 Article IV Concluding Statement (<http://www.imf.org/external/np/sec/pr/2013/pr13192.htm>).

²⁵ See Nabar (2011) for a discussion of the factors influencing the household saving rate.

financial markets and increasing the social safety net, authorities could encourage a shift from investment to consumption.²⁶

Investment growth was in excess of 20% per annum in nominal terms in 2009 and 2010 and investment reached nearly 50% of GDP. Investment has generally fallen as a share of GDP in developed economies as a result of the GFC; for example, in 2009 the share in the US was 15% and in New Zealand 18%, a fall of five percentage points or more from a peak in the mid-2000s in each case.²⁷ Despite the scope for China to catch up with the developed world, its recent rate of investment growth cannot be sustained indefinitely. China is already an outlier in terms of the share of GDP accounted for by investment, as noted in section 2.1 of the accompanying paper (Bowman and Conway, 2013, p.6-7). Investment has peaked as a share of GDP at a lower level of GDP per capita in other developing Asian economies, suggesting that investment growth is due to peak in China, reducing the main driver of overall economic growth.

Furthermore, the high rate of investment growth, which has exceeded GDP growth for some time, implies a rising capital-output ratio, ie, increasing amounts of capital are being utilised to generate each additional unit of output, suggesting that investment is becoming less productive and that returns to capital are falling. However, total factor productivity growth has been high,²⁸ indicating that China still has a long way to go before reaching low (or negative) returns from investment. Nevertheless, the rapid growth in investment in recent years points to the possibility of some over-investment.²⁹ State-directed investment decisions and the composition of investment being heavily weighted towards infrastructure (which may not produce an immediate or monetary return) support concerns about the efficiency of investment.

Another way of approaching this issue is to examine China's incremental capital-output ratio (ICOR), the ratio of investment's share of GDP to GDP growth. A higher ICOR indicates less efficient investment as more investment is required to produce each additional unit of output. China's ICOR averaged around 4 for the decade from 2000-2009, but increased above 5 in the final year as investment's share of GDP increased and growth slowed, pointing to lower capital productivity.³⁰ IMF forecasts implicitly have the ICOR around 5.5 for the next five years with the investment-share of GDP high relative to real GDP growth. The credit implications of this were discussed in section 2.2 above; here we are concerned with whether the rate of investment growth – and so economic growth, given investment's large share of activity – can be sustained.

Guo and N'Diaye (2009) examine the sustainability of China's export growth and conclude that to maintain the recent rate of export growth would require large gains in global market share in some key industries. From a modelling exercise they conclude that China is unlikely to be able to achieve the required competitiveness through productivity growth, lower profits or subsidies. They examine other strategies which might be followed, eg, moving up the value chain, changing the composition of exports and diversifying the export base and increasing the value-added of exports, but conclude from other emerging

²⁶ Baldacci *et al.* (2010) conclude that a sustained 1% of GDP increase in public expenditures, distributed equally across education, health and pensions, would result in a permanent increase in the household consumption ratio of 1¼ percentage points of GDP.

²⁷ IMF (2013).

²⁸ Bowman and Conway (2013) Table 2, p.8.

²⁹ It is difficult to resolve this issue because there are no official capital stock data for China, although Barnett and Brooks (2006) updated capital-output ratios (p.6). It is possible that the level of capital is still so low that the rate of investment growth can exceed the rate of total output growth for some time before the investment becomes unproductive and returns are negative.

³⁰ Citigroup (2011).

Asian economies' experience that there are limits to the growth in market share that a country can achieve. They consider that a rebalancing of the economy towards higher private consumption growth would provide a partial offset to lower export growth.

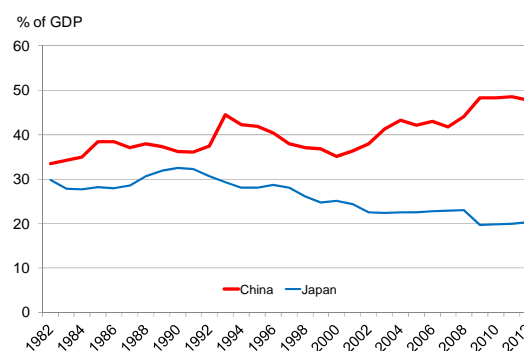
Their conclusion is reflected in the Twelfth Five Year Plan which envisages a transition from exports and investment to consumption as the main driver of growth and, partly as a result, from manufacturing to services. According to the plan, growth will decline to 7% per annum in the 2011-2015 period. This figure acknowledges that growth will slow as the economy rebalances and so is lowering expectations from the rapid rates of growth achieved in the past three decades. Growth far exceeded its target of 7.5% per annum in the previous five year period, averaging around 10% per annum.

We consider that investment growth in China is likely to fall from its recent rate as the stimulus from the response to the GFC fades, but it is likely to remain relatively high because per capita incomes are still low (indicating that there is room for them to catch up) and per capita capital stock is low compared with developed economies. A high investment-to-GDP ratio on its own will not constrain growth as long as the capital-output ratio is still low and the investment is generating positive returns. However, a decline from the recent high rates of investment growth is expected.³¹

2.4.2 Parallels with Japan in the 1980s are weak

Some commentators have claimed that there are parallels between China's recent growth and Japan's performance in the 1980s, which suggests a sharp slowing in growth for China.³² They argue that, at nearly 50% of GDP, China's investment-share is much higher than Japan's was in 1980 (Figure 4) and that this indicates a heightened risk of slowing growth. Japan's growth in the 1980s was dominated by investment, supported by a high saving rate, and by exports, resulting in a large current account surplus. Japan's expansion was fostered by an undervalued exchange rate (until the Plaza Accord in 1985) and rapid credit growth which led to asset price bubbles in equities and property. These bubbles burst in the late 1980s and early 1990s, with a surge in non-performing loans, and two decades of relative economic stagnation followed.

Figure 4 – Investment as a share of GDP



Source: IMF (2013)

Japan has not recovered from this episode, so the argument goes, because action was not taken to isolate the losses from the collapse in asset prices and rebuild bank and corporate balance sheets. In the past two decades, Japan has managed only weak economic growth and recently has experienced deflation, leading to declines in nominal GDP. On the basis of these parallels, some commentators argue that China is headed for a slowdown and perhaps even a long period of stagnation.

³¹ Ahuja and Nabar (2012) explore the impact on commodity exporters of a decline in China's investment-led growth.

³² See, for example, Martin Wolf "How China could yet fail like Japan" *Financial Times*, 14 June 2011.

Despite the similarities, there are many differences between Japan in the 1980s and China in the 2010s. For a start, China's per capita GDP is currently around one-fifth of the US's; Japan was at that level in 1950 and by 1990 had reached 90% of US levels. China's urbanisation rate now is similar to Japan's at the beginning of its expansion, at around 50%, and by the early 1980s Japan's urbanisation was much higher than China's today. These points suggest that in terms of the level of development, China is currently closer to where Japan was when it began its expansion after the Second World War than in the early 1980s. That indicates that China's development has some way to go before it follows a similar path to Japan in the 1980s.

N'Diaye (2010) examines the parallels between China's development in the past 30 years and Japan's between the 1950s and 1980s and points out that there are many differences between the two countries (apart from the level of development), for example the structure of the economy, the system of government and the global environment at the time. He concludes that there are limits to China's export-led growth strategy which is likely to incur resistance from trading partners, especially if it is based on an undervalued exchange rate.

He also concludes that the exchange rate, macroeconomic policies and structural reforms can play a key role in rebalancing the economy towards the non-tradables sector. He considers that the insights are relevant to China and that it can learn from Japan's experience; the differences between the two economies should also work in China's favour and allow it to avoid the path followed by Japan in the past two decades.

2.4.3 Slowdown in growth with income convergence

There is a broader question whether China's growth is sustainable, not only because of the large share of investment or parallels with Japan. In a recent paper, Eichengreen *et al.* (2011) conclude that fast-growing economies tend to slow when their per capita GDP reaches US\$17,000 in 2005 real international prices, a level which they expect China to achieve by around 2015. They define a slowdown as a sustained fall in the average GDP growth rate of at least two percentage points.

They characterise the process of catch-up growth as follows. China is an example of such growth.

“Rather than having to pioneer new technologies, late-developing countries can import knowhow from abroad. They can reap productivity gains simply by shifting workers from underemployment in agriculture to export-oriented manufacturing, where those imported technologies are utilized. With young generations engaged in saving enjoying higher incomes than elderly dissavers, they are able to finance high levels of investment.” (p.3)

The authors employ a growth accounting framework and show that the factors which have driven growth in the past can also lead to a slowdown as their growth declines; these factors include labour force growth, the rate of increase in educational attainment, growth in the capital stock and TFP growth. On the basis of their projections of these factors, they calculate that China will grow by around 6-7% per annum in the 2010s decade and by 5-6% in the 2020s decade. They conclude from this that China will experience a growth slowdown sometime in the next decade. In terms of an economic explanation, they interpret this as the “slower growth results from the convergence of TFP and the capital/labour ratio

to advanced country values, slower growth of educational attainment once school enrolment rates have reached reasonably high levels, and the ageing of the population.”³³

A particularly interesting finding of their study is that an undervalued exchange rate is likely to increase the chances of a slowdown. They suggest some reasons why this may be the case: it may make the economy more vulnerable to external shocks which result in a sustained slowdown; the real undervaluation of the exchange rate may boost growth in the early stages of development when labour is shifting from agriculture to manufacturing but be unable to provide ongoing support to growth when technology and innovation are more important; or it may be that undervaluation allows imbalances to build up which retard growth later.³⁴ A low consumption share of GDP is another marker for growth slowdowns; once again, China exhibits this trait.

The Eichengreen paper provides an analytical framework for assessing the factors which are likely to lead to a slowdown in fast-growing economies and how they apply in the case of China. Applying China's 2007 values of the various growth drivers, the authors estimate the probability of a slowdown at 71%. This conclusion supports our own analysis above in terms of the sustainability of the investment- and export-led growth model and the impact of demographics on trend growth.

If we accept the conclusions of the Eichengreen paper, growth in China is likely to slow as its development matures and the primary drivers of growth slow. While these results do not have any direct implications for the rebalancing of China's economy, even with annual growth of 5-6%, per capita incomes will continue to rise. The authors conclude as follows.

“That incomes in these countries will continue to rise and that the marginal propensity to spend on foodstuffs is higher at low and middle incomes is reason to think that higher food prices are here to stay. That emerging markets like China are energy intensive economies suggests that current upward pressure on commodity prices is more than a passing phase.”

This paper supports our conclusions in the previous sections that China's growth rate is likely to slow as the economy rebalances from investment- and export-led growth towards consumption-based growth, but that overall economic growth will remain robust for some time. This development would be positive for food and energy commodity demand, particularly if it is accompanied by reforms which will support the rebalancing, for example the introduction of a greater social safety net, an appreciation of the exchange rate and liberalisation of the financial system, all of which would encourage households to consume more. The risks to commodity demand are greater if China does not rebalance its economy and aggregate growth slows even more as a result.

There may be risks to this outlook in the short term, for example a loss of competitiveness from rapid wage growth or a tightening in credit conditions from a rise in bad debts. However, we consider that while these factors pose short-term risks to the outlook, China's economy will continue to grow at a rapid pace, albeit slower than in the past three decades. Within that outlook, growth is likely to become increasingly dependent on private consumption and less dependent on investment and exports.

³³ Eichengreen *et al.* (2011) p.13.

³⁴ IMF (2012b) considers that the renminbi is moderately undervalued against a broad basket of currencies.

This is also the conclusion of the joint World Bank-China Development Research Centre report “China 2030”. It projects annual growth slowing to 7% in the second half of the current decade and to 5% from 2026-2030.³⁵ Lee and Hong (2010) also expect China’s growth to slow from 6% in the current decade to 5% in the next as the determinants of growth slow, but emphasise the scope for policy reform to lift the aggregate growth rate by around one percentage point in each period. Zhuang *et al.* (2012) similarly expect China’s growth to slow from a potential rate of 8% in the 2010s to 6% in the 2020s. That would still be sufficient to complete China’s transformation from a low-income to a high-income country in less than 30 years. Haltmaier (2013) also concludes on a baseline scenario of declining population and productivity growth that China’s rate of economic growth will fall from around 10% to near 6½% by 2030. She considers that much lower growth rates are possible on less optimistic but still reasonable assumptions.

There is a counter to this view, which is that the rate of economic growth may slow in the high-income eastern provinces of China, but that growth in the low-income interior provinces will continue at a fast rate. Malkin and Spiegel (2012) point out that the higher-income provinces are already experiencing lower growth than the low-income regions and, arguing from the experience of other Asian economies which have hit the middle income trap, they consider that growth in the low-income regions may not begin to slow until the mid-2020s. They caution that China’s growth slowdown may not be as great as otherwise expected; however, they do not give a weighted average growth rate for the whole of China. It is likely that the flow of people from the interior to the coastal provinces will continue, supporting their aggregate growth rate. They do note that the growth rates of the interior provinces may not be as great as the coastal ones given their remoteness from industrial networks and inferior infrastructure.

China’s growth in the past three decades has been driven primarily by deregulation of the economy, particularly its opening to the global economy through trade liberalisation and foreign investment inflows, supported by increased inputs of capital and labour, manifested as the twin processes of industrialisation and urbanisation. These developments have resulted in increased investment and foreign trade, both exports and imports, and large increases in living standards. In that period, China has condensed several decades of catch-up growth, but it still has a long way to go before its living standards converge with those of the advanced economies of the world.

The challenge for China in coming decades will be to extend that growth as investment and population growth slow; this will require more efficient and effective use of existing inputs to generate higher value-added products and services (ie, higher multi-factor productivity growth). If China succeeds in doing this, it will be able to sustain higher incomes which will in turn support higher levels of consumption, allowing it to escape the middle income trap faced by many developing economies. China faces other challenges as well, such as the probable desire for more political freedom by the populace as their standard of living rises and the role of the state in the economy. Such political economy issues are beyond the scope of this paper.³⁶

³⁵ World Bank (2012a).

³⁶ See Acemoglu and Robinson (2012) for a discussion of the sustainability of China’s long-run growth in the context of what they term “extractive political institutions”. See also Jeffrey Sachs’ (2012) review of Acemoglu and Robinson.

2.5 Consumption to continue growing strongly

Despite slowing aggregate growth, consumption is expected to continue to grow strongly in coming years in China. There is likely to be a turning point in the growth in the working-age population (as detailed in section 2.3 above); as the working-age population declines and the age dependency ratio begins to rise, people will start drawing down their savings and spend more of their income on consumption. In addition, private consumption makes up only 35% of GDP, compared with a typical advanced economy of more than 60%, indicating that there is plenty of room for consumption to grow. Increasing urbanisation will also lead to higher consumption, with the UN estimating that by 2020 the urban population will increase by 15 million per year.

As the government introduces more social security, reducing the need for precautionary savings, the saving rate will most likely drop and consumption will rise. The Chinese Government's Twelfth Five Year Plan (2011-2015) incorporated a move in government spending from infrastructure to social services, although whether this is implemented in the near term remains to be seen. The transition to new government leadership which began in late 2012 may hold up any change in policy direction. However, the government has begun making some attempts to rebalance the economy more towards consumption.

Part of the large fiscal stimulus package introduced to support China through the GFC involved consumption-boosting measures including RMB850 billion (NZ\$170 billion) on medical and educational spending, income transfers to the rural sector, public sector worker and pension increases, as well as consumption and healthcare subsidies. There have also been policy reforms with the introduction of Labour Contract Law, increasing personal income tax thresholds so the number of households paying income tax will fall by 60 million to 24 million, the introduction of a rural pension scheme to cover 60% of counties and expansion of the urban pension scheme to have national coverage in 2012.

These factors will be positive for future Chinese private consumption. In order to achieve the goal of authorities to facilitate increasing consumption, analysts consider that policies to raise incomes should continue to be expanded and the social safety net extended to reduce the need for precautionary savings. An appreciation of the currency would also encourage consumption at the expense of exports. If the financial system is deregulated and real deposit interest rates rise, Chinese households are likely to reduce their saving rate as they appear to target a stock of savings and higher real interest rates would help them achieve that target level (IMF, 2011a).³⁷ In the following section we explore some of the specific channels through which China's future growth is likely to influence the New Zealand economy.

³⁷ See also Nabar (2011).

3 Outlook for China's impact on New Zealand

3.1 China's continuing growth will have benefits for New Zealand

While China's growth is expected to slow, it will continue at a relatively high level as incomes continue to converge with more advanced economies. The ongoing growth is likely to continue to be investment-led in the near future as infrastructure and housing investment continue to expand, increasing demand for hard commodities. The growth is also expected to incorporate steadily growing consumption, providing support for soft commodity demand. Consumption will slowly take over from investment as the driver of growth, providing a better long-term outlook for soft commodities than for hard commodities.

The positive outlook for Chinese commodity demand will benefit New Zealand's merchandise exports to China and will give continuing indirect benefits through Australia, while higher incomes in China and Australia will boost demand for New Zealand's services exports.³⁸ The IMF has estimated the impact of a comprehensive rebalancing of the Chinese economy in the form of a 20% appreciation of the exchange rate, lower precautionary savings, higher non-tradable goods consumption and financial sector liberalisation. The rebalancing is expected to increase the level of GDP by 0.2% and improve the current account balance by 0.2 percentage points in New Zealand and Australia after three years (IMF, 2011a).

The growing exposure to China will be assisted by the free trade agreement (FTA) which came into force in 2008 and reduces tariffs on China's imports from New Zealand over time. Some of this benefit may be eroded over time as other countries sign agreements with China, although New Zealand will benefit from already having relationships and supply chains set up. Eventually 96% of the products New Zealand currently exports to China will have tariffs removed. This will save around \$120 million in duties annually, based on current trade, and will make New Zealand exports more competitive in China.

Some duties will take a while to phase out, with milk powder taking 12 years to be tariff-free. A large portion of tariffs will be phased out over five to six years starting in 2008. An example of the FTA advantage is in beef and lamb where farmers are estimated to have saved \$25 million in tariffs in 2010, with tariffs to be fully eliminated by 2016, saving another \$21 million (Beef and Lamb NZ, 2011). New Zealand's imports from China will also benefit from tariffs being removed over time, giving more access to Chinese products and/or lower prices. Behind-the-border restraints are also likely to continue to break down as China becomes more familiar with doing business with New Zealand. China's development of trade links with other East Asian economies will also lead to an expansion of New Zealand's trade with the region as a whole.

Food exports, especially dairy products, will benefit from growing Chinese incomes, increasingly westernised diets and continuing quality concerns about Chinese food production. This sector has a strong long-term outlook as consumption begins to take more of a priority in China's economy and New Zealand is well placed to take advantage of this expansion in demand for food products. New Zealand has efficient production systems, well established supply chains to serve the Chinese market and is known for

³⁸ Services imports are generally found to have a significant positive income elasticity. See for example OECD (2004).

producing high quality products. As a result, New Zealand will be able to meet some of China's increased demand, although biological and environmental constraints may require some diversion from other markets to match this demand. The dairy industry will continue to benefit from high prices, which will in turn promote more resources being allocated to the industry and drive a volume increase.

Continuing strong growth in both residential and infrastructure investment should also maintain substantial demand for New Zealand logs. However, growth in demand for logs may not be as long-lasting as the increase in dairy demand, since the rate of growth in investment is expected to ease at some point in the future. In addition, the increase in demand from the rebuilding following the Sichuan earthquake in 2008 has passed. Continuing uncertainty about Russian export taxes will also benefit New Zealand forestry exports, although the removal of these taxes would erode New Zealand's advantage.

China's strong investment growth will keep demand for Australian commodities high in the short term, which will continue to provide indirect benefits to New Zealand. China is also taking on a larger role in Asian-wide supply chains, which will provide indirect benefits to New Zealand through the rest of Asia. There should also be opportunities for New Zealand to position itself within these supply chains as integration with China continues to grow. Growing Chinese incomes should also boost services exports to China as more households will be able to afford to come on holidays to New Zealand and to send their children to New Zealand for education.

China's domestic supply response to growing agricultural demand will be held back by a lack of agricultural land and water resources per capita, as well as limited rural labour as urbanisation continues. China's demand for agricultural imports will also be assisted by an appreciation of the exchange rate, making domestic production less competitive, and continuing concerns about the quality of domestic production.

The remainder of this section discusses the outlook for China's primary commodity demand (the basis for New Zealand food exports), and the two main sectors exposed to China, namely dairy and forestry. We have concentrated on these two sectors because, although exports of other products have also grown (including meat, wool and fish), their impact has been outweighed by dairy and forestry products. There are positive outlooks for other emerging sectors, for example seafood, wine and honey, but dairy and forestry are likely to dominate the outlook.³⁹ Following this is a discussion of services exports and potential risks to this outlook. We have not discussed other potential impacts of China's growth on the New Zealand economy, eg, the impact of increased imports from China or the impacts of China's growth on capital or labour markets.

3.2 China's commodity imports will continue to rise

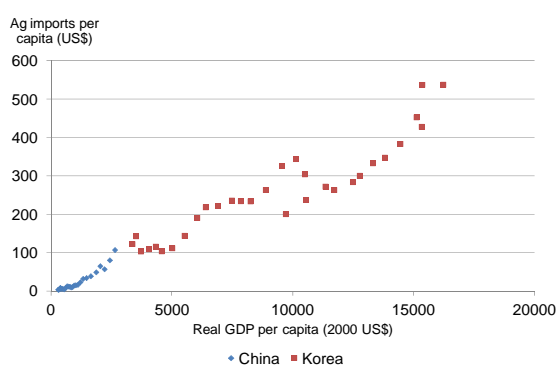
Continuing growth in incomes in China, along with an accompanying rise in demand for protein and a movement towards more westernised diets, will result in growing agricultural imports. This was the experience of Korea over its period of expansion beginning with a level of per capita GDP similar to China's currently (Figure 5.1).

³⁹ For further discussion of agricultural export opportunities for Australia and New Zealand, see ANZ (2012).

Demand for agricultural commodity imports will also be boosted by a low amount of water resources relative to China's population. The availability of freshwater resources in China is only around one-third of the global average on a per capita basis and is well below the average of low income countries (Figure 5.2). The water that China does have is unevenly distributed with Northern China having 47% of the country's population but only 20% of the water available. This shortage of water will be intensified as growing incomes bring an increase in domestic use of water, with households currently using only 7% of water. Increasing water use is encouraged by the low price of only about a third of the international average.⁴⁰ In addition, farmers are not encouraged to use water efficiently as they are often charged by the area they irrigate rather than the amount of water used, which further intensifies the shortage.

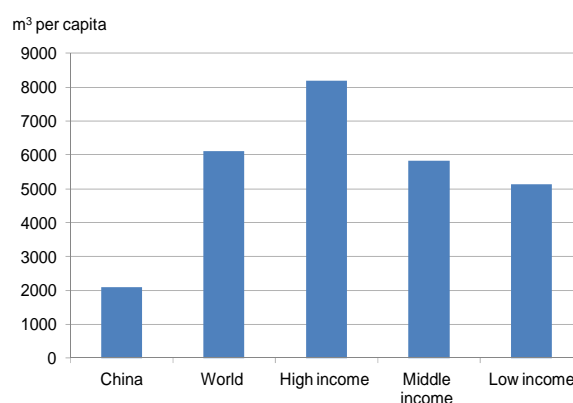
Figure 5 – Indicators of agricultural imports

Figure 5.1: Agricultural imports and GDP per capita – China and Korea



Sources: WTO, World Bank

Figure 5.2: China's freshwater resources



Source: World Bank

There is also a shortage of arable land, with China having only 0.08 hectares per person compared to the world average of 0.20 hectares per person (World Bank, 2013).⁴¹ This is very low compared to high income countries (0.32) and still low compared to low and middle income countries (0.18). The amount of arable land available has been shrinking over time as urbanisation and industrialisation have resulted in land being procured for other uses. Around 37% of Chinese land is degraded and unable to be used for farming. Desertification (the erosion of fertile land) is one of the biggest challenges facing China. In China, 20.2 million acres of arable land have been lost owing to wind and water erosion, urbanisation, industrialisation and natural disasters (United Nations, 2010).

Of the available arable land, nearly 20% is thought to be affected by pollution to some extent, which will make the land less useful or require expenditure to bring it up to standard. This shortage of arable land will restrict the domestic supply response to growing agricultural demand and will make it harder to produce the agricultural products required to feed China's large population. Furthermore, land is owned centrally and allocated to households by village leaders who change frequently. This means that farmers and leaders do not have much incentive to farm land in a sustainable way. In addition, land is often allocated to a household in multiple blocks, rather than as a single patch of land, which increases production costs and makes production less efficient.

⁴⁰ World Bank (2011).

⁴¹ This figure includes land defined by the FAO as land under temporary crops (double-cropped areas are counted once), temporary meadows for mowing or for pasture, land under market or kitchen gardens, and land temporarily fallow. Land abandoned as a result of shifting cultivation is excluded.

Furthermore, with continued urbanisation the availability of rural labour to produce agricultural products is diminishing. The UN projects that a further 100 million people will move from rural China to cities by 2022, which will limit the number of people available to work on farms. This shortage of labour, along with the shortages of land and water will likely result in a domestic production shortfall, with the deficit required to be met by agricultural imports. The OECD-FAO expects China's agricultural production to grow at 1.7% per annum between 2013 and 2022, which is not sufficient to keep up with consumption growth of 1.9% (OECD, 2013).

There are concerns about the quality of locally produced food, especially milk, which was highlighted by the melamine scandal in 2008. In the Chinese domestic production chain, products from different producers are often aggregated together and marketed as a single product. Counterfeiting and mislabelling are common. As a result of these factors, any investment in quality control adds little value to producers as they do not gain much reputational advantage and poor quality products from other producers could be attributed to them. The production chain in China is segmented, making it difficult to establish where the quality standards were infringed and enforcement of standards can be lacking. Chinese producers will have to work hard to gain back the trust of local consumers and until this occurs, the concern about the ability of local Chinese companies to set up safe supply chains will remain.

The concerns around food quality apply especially to baby milk formula. According to the UN, China has 82 million children under five years old and only 28% are breastfed, meaning there is a huge potential market. Over the past six years the Chinese baby formula market has tripled to US\$12.5 billion and Euromonitor expects it to double to US\$25 billion over the next four years (Financial Times, 2013). As a result of the melamine scandal, much of this growth will be sourced through imports, including New Zealand products which can be imported tariff-free.

These quality concerns should increase the demand for agricultural products from countries known for their quality, including New Zealand. China currently sources around 90% of its milk from local production, leaving scope for further expansion in dairy exports from New Zealand and for New Zealand processors to set up farms and manufacturing plants in China to meet China's growing dairy needs. Fonterra is planning to set up a cluster of four to six farms in Hebei with up to 30,000 cows to have direct access to the Chinese dairy market. Chinese groups have also invested in dairy farms in New Zealand, including the Shanghai Pengxin investment group buying 16 farms for NZ\$200 million. Investment links between the two countries will help to develop trade. In addition, the Renminbi has appreciated and is expected to continue appreciating, especially in real terms, making domestic production less competitive and imported agricultural products more attractive.

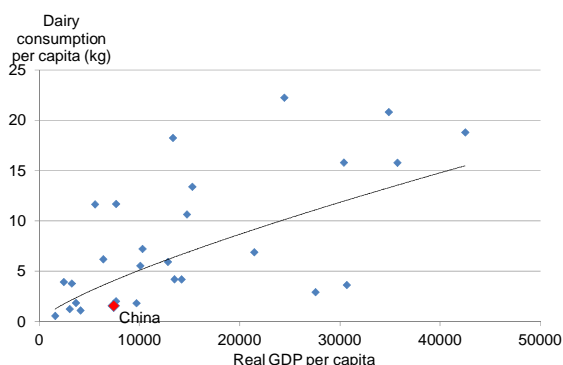
As Chinese incomes rise, consumers are likely to demand higher value food products. This gives New Zealand an opportunity to focus on exporting food products with higher value added, rather than the commodities that have dominated trade. If exporters can add more value to the products before they are exported, the benefit to New Zealand from Chinese demand will be even greater. New Zealand could leverage off its image of producing high quality, safe food products to promote these products in China.

While it is expected that consumption will gradually take over from investment as a driver of growth in China, it still requires significant amounts of investment to support its growing urban population. For example it is estimated that 350 million people will be added to the urban population over the next 20 years and the high speed rail network will increase from its current 10,000kms to 50,000kms by 2020 (World Bank, 2012b). These types of developments will continue to support demand for hard commodities, even if at a slower growth rate than in the past decade.

3.3 Increased demand for dairy products

China currently has a level of per capita dairy consumption well below the world average, even allowing for its low income level, leaving room for it to grow as incomes increase (Figure 6). Research has shown that dairy consumption has a high income elasticity when compared to other food products, especially for low income countries (Gerosa and Skoet, 2012). Gerosa and Skoet estimate that for low income countries a 1% increase in income leads to a 0.8% increase in

Figure 6 – Dairy consumption vs GDP



Sources: OECD-FAO, World Bank

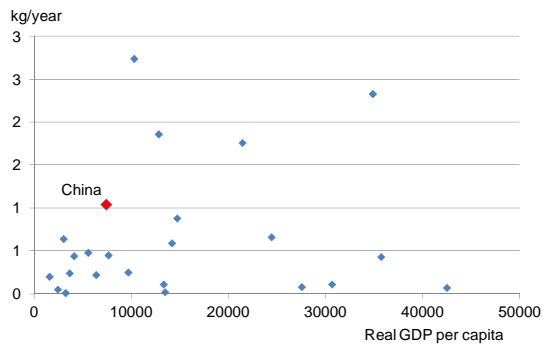
expenditure on dairy products. As incomes grow, this elasticity declines, but at a lesser rate than for other food products. Meat, which is New Zealand's third largest product export to China, has the second highest income elasticity of the food products studied. This shows there is still significant room for increased dairy demand, as incomes grow and diets become more closely aligned with developed countries in the future, providing benefits for New Zealand exporters.

Dairy product demand will also be supported by increased urbanisation in coming years. Milk consumption per capita in urban areas was 13.7kg in 2011 versus 5.2kg in rural areas (OECD, 2013), showing that as more people move into urban areas, overall dairy consumption will rise. Meat and poultry consumption is also significantly higher in urban households. Government guidelines recommend the consumption of milk in schools. If Chinese per capita consumption rose to match that of Taiwan, a market with similar tastes and geographical location but much higher per capita incomes, China would increase global milk and cheese consumption by more than 10% and 15% respectively (Matthews, 2010).

According to the Food and Agricultural Organisation, in conjunction with the OECD (OECD-FAO, 2012), the only dairy product that China consumes on a level comparable to other similar countries is whole milk powder (WMP) (Figure 7.1). China is the world's largest WMP importer and New Zealand the largest exporter. China's skim milk powder (SMP), butter and cheese consumption per capita is at a level much below other more developed countries. Per capita consumption of SMP, butter and cheese tends to increase as per capita GDP increases (Figures 7.2, 7.3, 7.4) showing there is plenty of room for Chinese consumers to increase their consumption of dairy products as their incomes continue to grow.

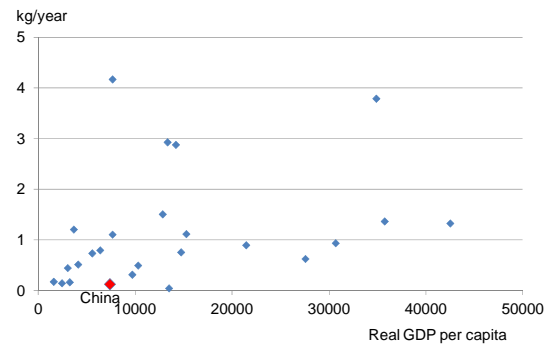
Figure 7 – Dairy consumption per capita

Figure 7.1: WMP consumption per capita



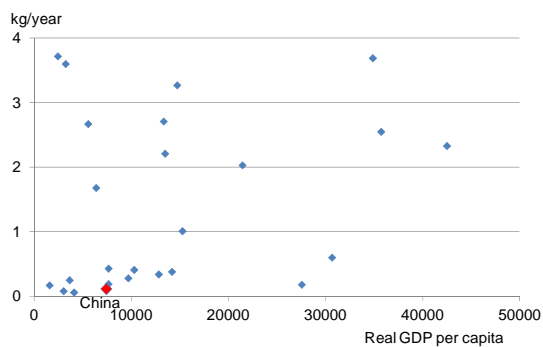
Sources: FAO, Treasury calculations

Figure 7.2: SMP consumption per capita



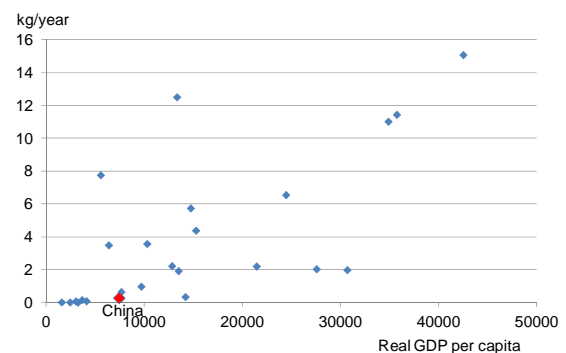
Sources: FAO, Treasury calculations

Figure 7.3: Butter consumption per capita



Sources: FAO, Treasury calculations

Figure 7.4: Cheese consumption per capita



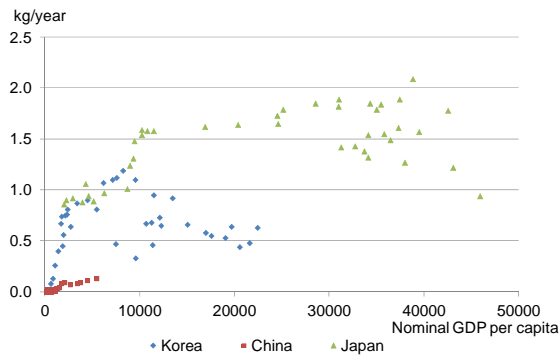
Sources: FAO, Treasury calculations

Of the various dairy products, China's consumption of SMP and cheese are most likely to increase in the near term, as China is well behind other countries with similar culture and income levels. Japan and Korea have SMP and cheese consumption per capita that is five times greater than China. If China follows a comparable path to Korea or Japan, its consumption of SMP and cheese will grow significantly in coming years as its GDP per capita grows (Figure 8).

If China's SMP consumption per capita grows to the level of Taiwan, it would increase world SMP consumption by 34%. New Zealand is the second largest SMP exporter in the world, with around a 23% share of world trade, and would stand to benefit from this increase to the extent that it is able to increase its dairy production. In some cases a fall in WMP consumption provides an offset to rising SMP consumption as incomes rise, although the OECD-FAO still expects WMP consumption to rise in coming years. The countries most similar to China in terms of income, Thailand and Algeria, also have higher dairy consumption per capita.

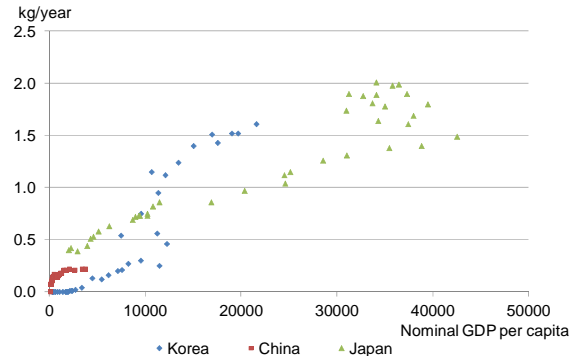
Figure 8 – Dairy consumption per capita

Figure 8.1: China, Japan and Korea SMP consumption and GDP per capita



Sources: FAO, Treasury calculations

8.2: China, Japan and Korea cheese consumption and GDP per capita



Sources: FAO, Treasury calculations

These factors lead the OECD-FAO (2012) to project that Chinese dairy consumption growth will outstrip production between 2012 and 2021. The net importation of dairy products is expected to increase by around 60% between the 2010-2012 base period and 2021. They project that WMP, SMP, butter and cheese consumption per capita will increase 2%, 3%, 1% and 3% respectively per annum over the next decade. This rising per capita consumption, along with the inability of production to keep up with consumption and growing concerns about the quality of domestic production, will require China to import product to make up the shortfall. It is projected imports of WMP, SMP, butter and cheese will increase 14%, 47%, 13% and 135% respectively over the next decade.

Even since the 2008 melamine scandal, nearly 300 tonnes of contaminated product has been detected. The Chinese State Council has since implemented stricter quality controls, which may increase the demand for imported products, unless local production complies with the new regulations. Indeed, new regulations forced the closure of a significant portion of small Chinese dairy processors in April 2011. These tighter regulations will increase costs and force more small producers out of the market. These factors will likely see increased demand for high quality imported dairy products. The production chain was reformed following the scandal and this is likely to contribute to slower domestic production growth. In addition, local production may be constrained by animal diseases, including foot and mouth for which nine provinces have officially reported outbreaks.

New Zealand is the world's largest dairy exporter, is known for its high quality products and already has well established supply chains into China. New Zealand currently supplies the majority of Chinese dairy production shortfall. Also, New Zealand has an advantage over most other countries in the world when it comes to dairy production, with significant endowments of water and land suitable for dairy. New Zealand has 77,336m³ of renewable water resources per person, compared to China which has only 2,134m³. Only 1% of New Zealand's renewable water supply is used by agriculture, compared to 13% in China (World Bank, 2011). However, New Zealand does face challenges around the quality and availability of water.⁴² These factors suggest that New Zealand will continue to provide a large portion of China's increased dairy imports in the future. This may require some reallocation of dairy exports from other export markets if dairy production does not increase sufficiently in New Zealand.

⁴² See the National Policy Statement for Freshwater Management (New Zealand Government, 2011) for more details.

While dairy production is fairly fixed during any given year, over a longer horizon it can increase to meet growing demand. The Ministry for Primary Industries (MPI) expects production to increase by 3% per year from 2015 to 2017 as cow numbers and milk solids per cow increase gradually (Ministry for Primary Industries, 2013). The OECD-FAO expects NZ milk production to average 2.3% annual growth between 2011 and 2020, while Fonterra expects New Zealand milk production will be able to grow at around 3% per annum, through growth in herd size and productivity gains (Fonterra, 2012).

If milk production increases 3% per annum it would add around 0.1 percentage points to GDP growth, given the dairy industry is around 4% of the economy. This would allow New Zealand production to keep up with increased demand from China. Even in the absence of increasing total export volumes, dairy prices are likely to stay high as China continues to dominate the world market with demand for high quality imported dairy products.

Fonterra estimates that global milk production can grow at around 2% per annum (slightly slower than New Zealand's production) until 2020, not sufficient to keep up with growing global demand of around 3%. This is mainly driven by China's 7% annual demand growth outstripping its 4% supply growth (Fonterra, 2012). The OECD-FAO also forecasts prices to remain high as the result of strong global demand growth putting pressure on supply. The pressure on supply comes from biological constraints, limited productivity growth in developing countries and lack of arable land as industrialisation takes away potential land.

As incomes grow, Chinese consumers will be willing to pay higher prices to secure quality food products as a lot of people do not trust the quality of locally produced product. The OECD-FAO expects that dairy prices will increase gradually in nominal terms out to 2022 as demand in developing economies outstrips the supply response in those countries, increasing import demand. This will result in prices in real terms being significantly higher over the next decade than in the previous decade. MPI also expects dairy prices to gradually increase in nominal terms out to 2017 (Ministry for Primary Industries, 2013).

3.4 China's demand for forestry products to increase

The forestry sector is expected to benefit from China's ongoing strong investment, especially in residential construction. Housing and infrastructure investment will continue to grow strongly as China's industrialisation and urbanisation continue. Demand for housing continues to surge and the government has also made building new housing a priority to try to contain house price inflation. In its Twelfth Five Year Plan the government committed to constructing 36 million state-subsidised houses. It has also become a priority to increase the stock of housing in low-income urban areas.

Around half of Chinese forestry consumption is in the housing and construction sector (Deutsche Bank, 2007). About a quarter is used in consumer products, the production of which is expected to increase strongly in coming years as the economy is rebalanced towards domestic consumption. These factors will continue to support demand for forestry products, although the growth may slow as the economy rebalances away from investment to consumption.

While China has the fifth largest forestry area in the world, forestry area as a percentage of total land and forest area per capita are both low by world standards. China has 22% of its land area in forestry compared with a figure of 31% for both the world average and New Zealand. China has only 1.6 square kilometres of forestry land per 1,000 people, compared to the world average of 5.7.⁴³ However, the exact amount of forestry land available is harder to gauge as a lot of its new forests are locked up for erosion control and environmental reasons. Also, entry costs to the forestry sector in China are very high owing to the large capital expenditure required to get into the industry and the long harvest cycles for tree species in China.

In addition, a lot of the forestry area is deep inland, making transportation costs high, although as infrastructure continues to improve this will become less of a problem. China has also made the protection of forest land a priority over the next 10 years, making it more difficult to harvest forests in the short term to meet growing timber demand. These factors suggest that as the demand for forestry products continues to grow, China will have to source more of these products from overseas. As demand is likely to continue to outstrip domestic supply, there will be further need for China's forestry imports to grow, some of which can be met by New Zealand, which supplied 8% of China's wood and wood product imports in 2010 (Ma, Liu, & Du, 2009).

Forestry analysis company RISI forecasts that China's forestry deficit will increase from 117 million m³ in 2010 to 182 million m³ (55%) in 2015 (Flynn, 2011). The US Department of Agriculture (USDA) predicts that China will increasingly substitute imports of softwood logs for hardwood logs to use in construction and interior decoration (USDA, 2010b). This will benefit New Zealand as it supplied 26% of China's softwood log imports in 2011, up from 5% in 2007, partly replacing Russian exports which fell from 91% in 2007 to 42% in 2011 (USDA, 2012).

New Zealand should be a favoured source of forestry products owing to trade and environmental protectionism in other competing supplier countries. Several countries have started tightening up on illegal logging, which if successful will reduce supply from those countries. Also, environmental factors in certain countries have led governments to become stricter about keeping logging at a sustainable level. Russia (the world's largest forestry producer) increased its export tax on logs to 25% in 2008, increasing the competitiveness of New Zealand logs. The uncertainty around the future of Russian export taxes makes more stable suppliers, including New Zealand, more attractive.

Wood availability forecasts from MPI suggest there is potential for New Zealand to increase harvesting in the longer term. Currently around 22 million cubic metres (m³) of radiata pine are harvested per annum and this is expected to rise by around two million m³ per annum by 2015. Harvested volumes are projected to increase by 10 million m³ between 2015 and 2025 (Ministry for Primary Industries, 2013). Forestry prices are also likely to remain high owing to China's forestry deficit impacting the world market with extra demand. MPI forecasts log prices to increase from their 2013 level of \$119 per m³ to \$140 in 2017, a 17.7% increase. Other forestry products are expected to have similar increases over the forecast period.

⁴³ Forest area is land under natural or planted stands of trees of at least 5 metres, whether productive or not, and excludes tree stands in agricultural production systems (for example, in fruit plantations and agro-forestry systems) and trees in urban parks and gardens (World Bank, 2013).

3.5 China's demand for services imports likely to grow

As China experiences rising incomes, increased urbanisation and more international integration, services imports are expected to continue to increase. The Chinese National Tourism Administration forecasts that outbound trips will grow from 65 million in 2011 to 100 million in 2015 and with spending of US\$100 billion overseas.⁴⁴ The NZ Ministry of Tourism's goal is for Chinese tourists to increase spending in New Zealand from \$457 million in 2011 to \$579 million (27%) by 2015 (Tourism New Zealand, 2012). This is made up of total visitor nights rising as China becomes more internationally integrated, and average nightly expenditure increasing, as a result of Chinese incomes rising (Ministry of Economic Development, 2011).

Visitor arrival numbers are forecast to increase 15% in 2013 and 10% in 2014. Inbound Chinese visitor numbers will also be boosted by the introduction of new airline routes between the two countries. China Southern Airlines started a route between Guangzhou and Auckland in April 2011, expanded to a daily service in November that year. The new route is expected to boost seat numbers by 80,000 a year and bring in \$175 million in tourism spending.

Rising incomes and increasing international integration should also mean more Chinese families can afford to send their children overseas for their education, including to New Zealand. This will be helped by the fact that New Zealand is a country with Approved Destination Status for individuals (along with Australia). New Zealand's services trade with China is dominated by personal and educational travel services exports and the total value of services trade with China is low relative to the value of merchandise trade,⁴⁵ indicating that there is scope for services trade with China to expand as incomes rise in China and merchandise trade increases.

3.6 China's large impact to continue despite slowing growth and risks

A slowing in China's growth rate suggests that its impact on New Zealand will begin to lessen. However, as China now has a higher share of New Zealand trade, China's growth rate does not need to be as high as in the past to give the same contribution to New Zealand's growth. As it is expected that China's share of New Zealand exports will continue to grow, this means that its contribution to economic growth will continue to increase. If we assume that China's demand for New Zealand exports grows in line with China's GDP, then its contribution to New Zealand GDP can be expressed as China's GDP growth multiplied by its share of New Zealand exports multiplied by exports' share of New Zealand GDP.

Between 2000 and 2005 China's nominal GDP growth rate averaged around 12%, exports were around 31% of New Zealand's GDP and China accounted for 5% of exports. This suggests a direct contribution of 0.2 percentage points to nominal GDP growth from exports to China. With total exports 28% of New Zealand GDP and China accounting for 13% of total exports in 2012, China would only need to grow by around 5% to have the same contribution to New Zealand GDP as in 2000-2005. With China's nominal growth

⁴⁴ <http://news.travel168.net/20110401/27447.html>

⁴⁵ In the year to June 2012, bilateral services trade with China was worth NZ\$1.4 billion relative to total merchandise trade of NZ\$13.8 billion, compared with services trade worth NZ\$9.5 billion and total merchandise trade of NZ\$17.7 billion with Australia.

rate expected to be around 10% in the next few years, the expected contribution of gross exports to China to New Zealand nominal GDP growth would be around 0.4 percentage points, all else equal.⁴⁶ Osborn and Vehbi (2013) estimate the impact of China's growth on the New Zealand economy, including indirect effects via Australia, using the framework of an econometric model.

New Zealand and Australia both face risks associated with having a large share of product exports dependent on a single market such as China. A significant slowdown in growth, greater than the gradual slowing envisaged above, or any incidents which result in a disruption of trade, could have serious consequences in terms of lower export volumes and a fall in commodity prices simply because of the dependence on a single market.

The manufacturing sectors in Australia and New Zealand have been contracting as a share of the economy in recent years, partly owing to the competition from China which they cannot match, exacerbated by the high exchange rates. This is likely to continue in New Zealand as manufacturers find it difficult to compete with low-cost Chinese production, which will be supplanted by other low-cost producers such as Vietnam and India as costs rise in China. Niche-market producers are likely to remain successful, with setting up a manufacturing arm in China an option for others to take advantage of lower labour costs.

⁴⁶ This is a standard methodology for quantifying spillovers; see for example Ahuja and Nabar (2012).

4 Conclusions

China's growth is expected to slow to a more sustainable pace in the next decade compared with the previous decade, but will remain strong relative to New Zealand's other trading partners. Economic growth is expected to slow as investment growth eases owing to a decline in returns on investment and China's exports reaching a limit with increasing global market shares. These developments are unlikely to be fully offset by faster consumption growth, although consumption is likely to slowly replace investment as the main driver of domestic demand in China. China's population growth is likely to start to slow in the mid-2020s and the working-age population will start to decline in the mid-2010s, leading to lower aggregate GDP growth. Population ageing is expected to lead to a lower saving rate and faster consumption growth, supporting rebalancing of the economy.

The slowing export and investment growth is likely to lead to lower growth in China's demand for hard commodities, although the ongoing processes of industrialisation and urbanisation will continue to support this demand. As a result of the switch in growth drivers, demand for soft commodities is likely to increase more than demand for hard commodities.

Dairy and meat consumption per capita generally grow as incomes increase. In particular, consumption of skim milk powder and cheese are expected to grow significantly in the next decade, keeping prices for these products high. China's large population means that any per capita consumption increase will have significant impacts of global markets. China's overall shortage as well as an uneven and inefficient allocation of water resources and suitable farm land per capita will limit the domestic supply response to growing demand. These factors, as well as concerns about the quality of domestically produced food, mean that imports will be relied upon to meet growing demand for soft commodities.

New Zealand is well placed to take advantage of this expansion in demand for soft commodities as it has the natural endowments of water and fertile soil, efficient production systems embodying advanced technology and ongoing investment in innovation, well-developed infrastructure (including quality assurance) and a reputable country of origin "brand". New Zealand also has an advantage as the first advanced economy to sign a free trade agreement with China in 2008. Demand for dairy products has ample room to grow with currently low levels of consumption per capita, and evidence suggests that dairy consumption (and food imports) increase as incomes grow. Also, Chinese diets are becoming more westernised and urbanisation will continue.

China's growing share of New Zealand exports means that their contribution to economic growth will continue to increase, despite an expected slowdown in the Chinese economy. However, New Zealand faces risks associated with some major product exports heavily exposed to a single market such as China.

Overall, we expect that New Zealand will become increasingly integrated with developing Asia (particularly China) and Australia across a range of dimensions, but with trade being the most important. New Zealand should benefit from this closer integration with a fast-growing part of the world; demand for our products is expected to remain high and to result in resources being increasingly allocated to those activities, increasing national income and raising living standards.

5 Bibliography

- Acemoglu, D. and Robinson, J. (2012). *Why Nations Fail: The Origins of Power, Prosperity, and Poverty*. (Profile Books)
- Ahuja, A. and Myrvoda, A. (2012). "The Spillover Effects of a Downturn in China's Real Estate Investment." International Monetary Fund Working Paper 12/266.
- Ahuja, A. and Nabar, M. (2012). "Investment-Led Growth in China: Global Spillovers." International Monetary Fund Working Paper 12/267.
- ANZ (2012). "Greener Pastures: The Global Soft Commodity Opportunity for Australia and New Zealand." ANZ Insight, Issue 3, October 2012
<http://www.media.anz.com/phoenix.zhtml?c=248677&p=irol-insight>
- Baldacci, E., Callegari, G., Coady, D., Ding D., Kumar, M., Tommasino, P. and Woo, J. (2010). "Public Expenditures on Social Programs and Household Consumption in China." International Monetary Fund Working Paper 10/69.
- Barnett, S. and Brooks, R. (2006). "What's Driving Investment in China?" International Monetary Fund Working Paper 06/265.
- Beef and Lamb NZ. (2011). China FTA delivering for NZ sheep and beef farmers. (9 August 2011) Retrieved from Scoop:
<http://www.scoop.co.nz/stories/BU1108/S00293/china-fta-delivering-for-nz-sheep-and-beef-farmers.htm>
- Bowman, S. and Conway, P. (2013). "China's Recent Growth and its Impact on the New Zealand Economy." New Zealand Treasury Working Paper 13/15.
- Citigroup. (2011). "China Macro View: Can Investment Continue to Support Growth?" Citi Investment Research & Analysis, 20 September 2011.
- Citigroup. (2012). "China Macro View: The Urbanisation Dividend." 23 October 2012.
- Dairy Australia. (2011). Dairy 2011 Situation and Outlook. Retrieved from Dairy Australia:
<http://www.dairyaustralia.com.au/Statistics-and-markets/Dairy-Situation-and-Outlook-September-2011.aspx>
- Das, M. and N'Diaye, P. (2013). "Chronicle of a Decline Foretold: Has China Reached the Lewis Turning Point?" International Monetary Fund Working Paper 13/26.
- Deutsche Bank. (2007). "China Forestry Industry: Seeing the forest for the tree." Global Markets Research.
- Eichengreen, B., Park, D. and Shin, K. (2011). "When fast growing economies slow down: international evidence and implications for China." NBER Working Paper 16919.
- Financial Times. (2013). Dairy producers flock to cater for China's babies. Retrieved from
<://www.ft.com/intl/cms/s/0/e5d7fd64-d279-11e2-aac2-00144feab7de.html#axzz2WRWwOnZV>
- Fitch. (2010). "Chinese Banks: Informal Securitisation Increasingly Distorting Credit Data", Fitch Ratings, 14 July 2010.
- Fitch. (2011). "Chinese Banks: Growth of Leverage Still Outpacing GDP Growth", Fitch Ratings, 13 July 2011.
- Flynn, R. (2011). "China's Timber Supply Outlook, 2011-2015." RISI Special Market Analysis Study.

- Fonterra. (2012). Strategy Refresh & 2012 Interim Results.
http://www.fonterra.com/wps/wcm/connect/477af564-4b72-44d0-8db0-85a41386d281/2012%2BInterim%2BResults%2B%26%2BStrategy%2BRefresh%2BPresentation_analyst.pdf?MOD=AJPERES&CACHEID=477af564-4b72-44d0-8db0-85a41386d281
- Fox, A. (2010). Fonterra eyes options for China relaunch. The Dominion Post, Monday 30 August 2010.
- Gerosa, S. and Skoet, J. (2012). "Milk availability: Trends in production and demand and medium-term outlook." ESA Working Paper No. 12-01.
- Guo, K. and N'Diaye, P. (2009). "Is China's Export-Oriented Growth Sustainable?" International Monetary Fund Working Paper 09/172.
- Haltmaier, J. (2013). "Challenges for the Future of Chinese Economic Growth." Board of Governors of the Federal Reserve System, International Finance Discussion Paper 1072, January 2013.
- International Monetary Fund. (2011a). "People's Republic of China: 2011 Article IV Consultation." IMF Country Report 11/192, July 2011.
- International Monetary Fund. (2011b). "People's Republic of China: Financial System Stability Assessment." IMF Country Report 11/321, November 2011.
- International Monetary Fund. (2012a). Asia-Pacific Regional Economic Outlook. April 2012.
- International Monetary Fund. (2012b). "People's Republic of China: 2012 Article IV Consultation." IMF Country Report 12/195, July 2012.
- International Monetary Fund. (2013). World Economic Outlook and associated database. April 2013.
- Lee, J-W. and Hong, K. (2010). "Economic Growth in Asia: Determinants and Prospects." Asian Development Bank Working Paper, No 220, September 2010.
- Lee, I., Syed, M. and Xueyan, L. (2012). "Is China Over-Investing and Does it Matter?" International Monetary Fund Working Paper 12/277.
- Lewis, W. A. (1954). "Economic Development with Unlimited Supplies of Labor." Manchester School of Economic and Social Studies, Vol. 22, pp. 139-91.
- Ma, Q., Liu, J. and Du, W. (2009). How Chinese forestry is coping with the challenges. Retrieved June 27, 2011, from FAO:
<http://www.fao.org/docrep/012/i1025e/i1025e09.htm>
- Malkin, I. and Spiegel, M. (2012). "Is China due for a slowdown?" Federal Reserve Bank of San Francisco Economic Letter, 15 October 2012.
- Matthews, L. (2010). Global Dairy Market Review. Commonwealth Bank of Australia.
- McKissack, A. and Xu, J. 2011. "Chinese macroeconomic management through the crisis and beyond." Australian Treasury Working Paper, 2011-01.
- Ministry of Economic Development. (2011). International Visitor Survey. Retrieved from <http://www.tourismresearch.govt.nz/Data--Analysis/International-tourism/International-Visitors/IVS-Pivot-Tables/>
- Ministry for Primary Industries. (2013). Situation and Outlook for Primary Industries 2013.
- Nabar, M. (2011). "Targets, Interest Rates, and Household Saving in Urban China." International Monetary Fund Working Paper 11/223.

- New Zealand Government. (2011). National Policy Statement for Freshwater Management. Ministry for the Environment, May 2011.
- N'Diaye, P. (2010). "Transforming China: Insights from the Japanese Experience of the 1980s." International Monetary Fund Working Paper 10/284.
- OECD. (2004). OECD Economic Outlook 75. Chapter V.
- OECD-FAO. (2011). Retrieved from Agricultural Outlook 2011-2020: http://www.agri-outlook.org/pages/0,2987,en_36774715_36775671_1_1_1_1_1,00.html
- OECD-FAO. (2012). Retrieved from Agricultural Outlook 2012-2021: http://www.agri-outlook.org/pages/0,2987,en_36774715_36775671_1_1_1_1_1,00.html
- OECD. (2013). Feeding China: Prospects and challenges in the next decade. OECD-FAO Agricultural Outlook.
- Osborn, D. and Vehbi, T. (2013). "Empirical Evidence on Growth Spillovers from China to New Zealand." New Zealand Treasury Working Paper 13/17.
- Roubini Global Economics. (2011). "How solid are Chinese banks?" 26 May 2011.
- Sachs, J. (2012). "Government, Geography, and Growth: The True Drivers of Economic Development." Foreign Affairs Volume 91, Number 5, September/October 2012.
- Sullivan, R. and Aldridge, T. (2011). "The outlook for commodity prices and implications for New Zealand monetary policy." Retrieved from Reserve Bank of New Zealand: http://www.rbnz.govt.nz/research_and_publications/research_programme/additional_research/4363112.html
- Tourism New Zealand. (2012). China Market Update August 2012 . Retrieved from <http://www.tourismnewzealand.com/markets-and-stats/north-asia/china/situation-and-outlook/>
- United Nations. (2010). Land degradation among China's food supply challenges, says UN expert. Retrieved from <http://www.un.org/apps/news/story.asp?NewsID=37151>
- United States Department of Agriculture. (2010a). People's Republic of China: Dairy Products Annual Report. Global Agricultural Information Network.
- United States Department of Agriculture. (2010b). People's Republic of China: Forest Products Annual Report. Global Agricultural Information Network.
- United States Department of Agriculture. (2012). Peoples Republic of China: Solid Wood Annual 2012. Global Agricultural Information Network.
- World Bank. (2011). Retrieved 2011, from World Bank Data: <http://data.worldbank.org/indicator/AG.LND.ARBL.ZS/countries>
- World Bank. (2012a). China 2030: Building a Modern, Harmonious, and Creative Society.
- World Bank. (2012b). Building Sustainable Transport Systems in Chinese Cities. Retrieved from [://www.worldbank.org/en/news/feature/2012/08/14/building-sustainable-transport-systems-in-chinese-cities](http://www.worldbank.org/en/news/feature/2012/08/14/building-sustainable-transport-systems-in-chinese-cities)
- World Bank. (2013). Retrieved 2011, from World Bank Data: <http://data.worldbank.org/indicator/AG.LND.ARBL.ZS/countries>
- Zhuang, J., Vandenberg, P. and Huang, Y. (2012). "Growing beyond the low-cost advantage: How the People's Republic of China can avoid the middle-income trap." Asian Development Bank, October 2012.