

# China's one child policy

Lisa Cameron and Xin Meng

From *The New Palgrave Dictionary of Economics*, Online Edition, 2014

Edited by Steven N. Durlauf and Lawrence E. Blume

## Abstract

Between 1979 and late 2013, China's One Child Policy restricted urban couples to having only one child. In this article we review the evidence on the policy's impact on population growth, as well as its largely unforeseen impacts on population aging, gender inequality, behaviour and values, and the economy. As a result of the policy, China's population is not only smaller than it would have been, but also aging rapidly. The burden of looking after elderly parents and grandparents now often falls on a single child. The policy, coupled with a strong cultural preference for sons and the availability of sex-selective abortion, has led to men significantly outnumbering women. Many men now find it difficult to find a wife. Women's scarcity has provided some benefits to women, for example, in terms of greater power within the household. The generation of only children produced by the policy has been shown to differ from previous generations – for example, being less pro-social and more risk-averse. Recent reforms to the policy allow urban couples in which at least one is an only child to now have two children. The article concludes with a discussion of the implications of this recent change.

## Keywords

aging; China; family planning; gender; One Child Policy

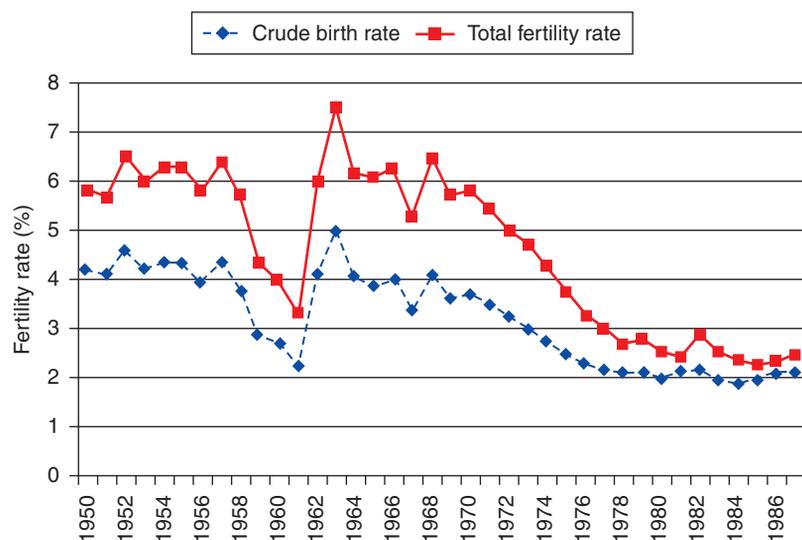
## JEL classifications

J10; J16; O12; O29; O53; P21

## Article

### Background

When the Communist Party came to power in China the country was recovering from the Second World War and its civil war. The war-torn country desperately needed people to rebuild the nation. Consequently, the country's population policy at that time was to encourage a high birth rate. Along the lines of the Soviet model, China awarded mothers of many children "Mother-Hero" status and, like most post-Second World War western countries, China had a baby boom, with the total fertility rate hovering around six births per mother. This period of high fertility lasted until the great famine in the late 1950s. The three-year famine significantly reduced the birth rate, but soon after population growth bounced back to over and above the pre-famine level (see Figure 1). China's total fertility exceeded six births per mother throughout the 1960s (Banister, 1987).



**Figure 1** China’s fertility rates, 1950–1987. (Sources: The data for years 1950 to 1972 are from Banister (1987) and for the years from 1973 to 1978 are from Feeney *et al.* (1989).)

Low agricultural productivity, economic stagnation and economic isolation as a result of the Cold War, coupled with vivid memories of the Great Famine, led to concern that China might again not be able to feed its growing population. In the early 1970s, in the middle of the Cultural Revolution, a philosophical ‘debate’ over the possibility of a Malthusian Population Trap was initiated, and soon after, at the end of 1973, the policy of ‘Later, Longer, and Fewer’ was introduced (Center for Population Studies, CASS, 1986; Peng, 1991; Feeney and Wang, 1993; Cai, 2010; Ebenstein, 2010). The policy encouraged couples to get married later, have longer periods in between children, and have fewer children. The policy had a significant impact on the birth rate, especially amongst the urban population. During the course of the 1970s the total fertility rate fell from above 5 to just around 2 (Wang, 2011). In January 1978 a new policy of ‘One is the Best and Two is the Most’ and ‘Reward Having One Child and Punish Having Three’ was introduced. This was soon followed by the introduction of the ‘One Child per Couple’ policy (hereinafter the One Child Policy (OCP)) at the second meeting of the fifth People’s Congress in June 1979 (see, for example, Center for Population Studies, CASS, 1986; Peng, 1991).

Although the OCP was originally intended to cover the country as a whole, by and large, rural areas have always allowed a second birth if the first child is a girl (Peng, 1991). The proportion of the population with rural household registration (*hukou*) was more than 80% in 1980 and was still above 70% in 2010. Some rural areas over some periods have even allowed three children. In addition, there are different rules for minority groups, which are subject to much looser restrictions. In urban areas, however, the policy has been strictly enforced since it was introduced (Kane and Choi, 1999; Zhang and Sturm, 1994). Those who obey the policy are rewarded financially while those who violate the policy are subject to fines and their children face higher fees for accessing education and health services. In some cases children are denied these services (Peng, 1991; Zhang and Sturm, 1994).

## Impacts

### *Population size*

The ultimate objective of the introduction of the OCP was to control population size. To be specific, the goal was to keep the total population at no more than 1.2 billion by 2000 (Wang *et al.*, 2012). During the past few years, there has been heated debate in the literature over the magnitude of the impact of the policy on population size in China.

The official Chinese government claim is that some 400 million births were prevented due to the OCP. According to Wang *et al.* (2012), the original '400 million' figure came from a simple extrapolation conducted by Yang *et al.* (2000) to project what the crude birth rate would have been if it had continued to decline as it did from 1950 to 1970. Wang *et al.* (2012) challenge the 400 million estimate for two reasons: (1) they argue that Yang *et al.*'s (2000) original projection used the wrong counterfactual. (They did not take into account the fact that between 1970 and 1979, before the introduction of the OCP, China's fertility rate had already dropped by 50%.); and (2) many countries which had similar fertility rates to China in 1970 also experienced significant drops in fertility in the absence of the OCP. For example, Thailand and China have had almost identical fertility trajectories since the 1980s, but Thailand did not adopt a one child policy.

Using the actual Chinese fertility rate in 1979 (just before the introduction of the OCP) and the fertility trends in 16 other countries, which had similar fertility rates to China in the year 1970, Wang *et al.* (2012) use a Bayesian model to project China's counterfactual fertility trend. Their projection is that fertility would have continued to decline after 1980 and would have fallen to 1.5 children per woman, as currently observed. In other words, without the OCP China would have had the current population size anyway.

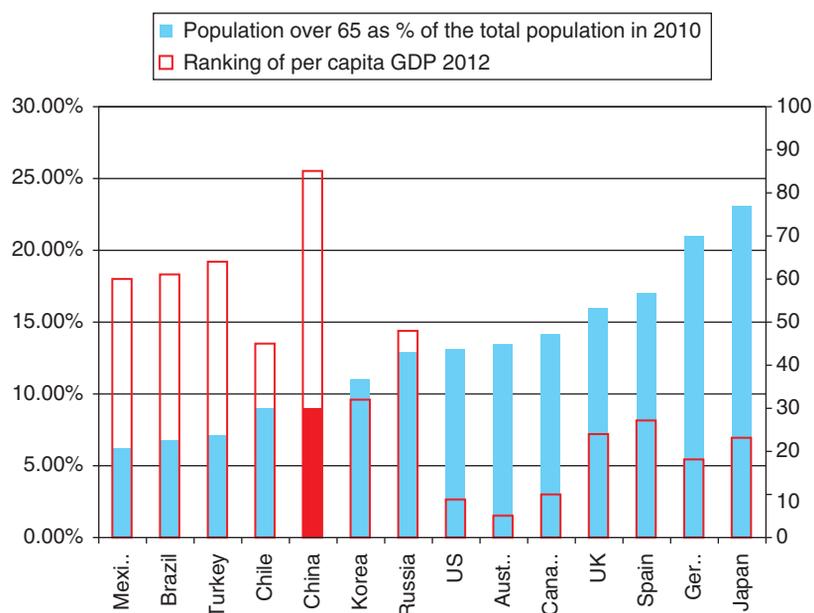
The main issue in this debate is whether the 16 other countries are a credible counterfactual. Most of the 16 countries have very different income levels, institutional structures, and cultures to China and all these potentially contribute to fertility behaviour. In addition, Wang *et al.* (2012) acknowledge that the proportion of households that have only one child in China is very high and admit that the proportion would never have reached the high level observed without the OCP. If this is the case, then the OCP must have played some role in curtailing population growth.

### *Population aging*

If one accepts that the OCP did reduce the fertility rate, then population aging is one of the significant consequences of the reduction in births over more than three decades. Concomitant increases in life expectancy have further exacerbated population aging. In 1980 around 5.8% of China's population were aged 65 and over. Three decades later, this ratio had increased to 9%. Although, relative to many developed countries, this is not an especially high proportion (for example, in the same year the USA and Japan had, respectively, 13% and 23% of their populations over 65), China is aging with much lower income levels.

Figure 2 compares China's aging population ratio with several other countries. China is ranked below the median level, but all the countries listed have much higher per capita income levels than China. For example, in 2012 Chinese per capita GDP was ranked 85th (US \$6,569) among the 183 countries, while Chile, a country with

the same aging population ratio as China, was ranked 45th in per capita GDP (US\$ 16,834). The country closest to China's income level is Turkey, with per capita GDP ranked 64th (US\$ 10,745), and whose aging population ratio was much lower than China, at 7.1%.

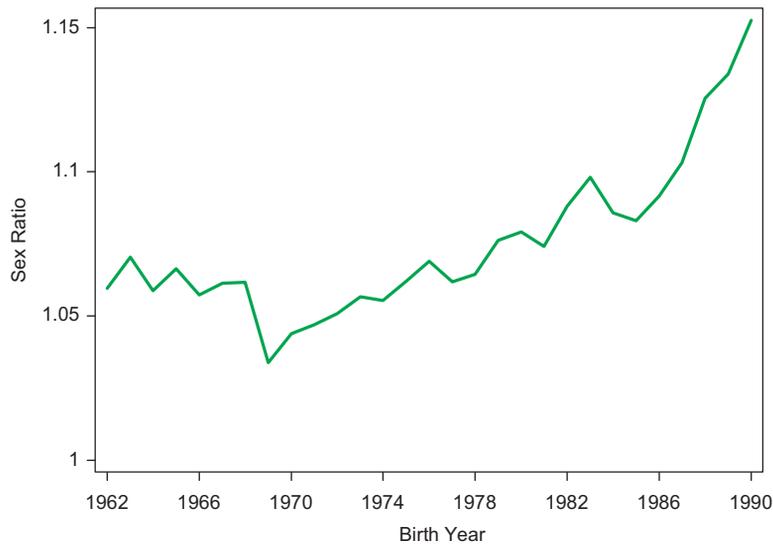


**Figure 2** Share of population over 65 and economic development. (Source: Aging population data are from OECD StatExtracts: [http://stats.oecd.org/Index.aspx?DataSetCode=ALFS\\_SUMTAB](http://stats.oecd.org/Index.aspx?DataSetCode=ALFS_SUMTAB), while per capita GDP data are from World Economic Outlook Database – October 2013, International Monetary Fund.)

Lower income with a rapidly aging population inevitably creates a financial burden on the government. This is because aged care, especially medical care, is costly. China's Health and Retirement Survey team report that a large fraction of China's elderly have physical health limitations (CHARLS Research Team, 2013). The problem is even more serious when one considers the proportion of households in which the responsibility for looking after elderly parents and/or grandparents falls on only one child (an average of 40% of households across the country as a whole and 86% of households with urban residency (*hukou*); Wang *et al.* (2012)). China has traditionally relied heavily on families to provide aged care. Even today the Elderly Rights and Security Law states that adult children have financial and emotional responsibility for their elderly parents (Zhang, 2000). Previously the parental old age care responsibilities could be shared among siblings. However, this will not be possible for the single-child generation. Thus additional social care and social expenditure will be called upon.

### *Gender equality*

Figure 3 shows China's sex ratio from 1950 (almost three decades prior to the introduction of the OCP) until 1990. For most of 1950 to the late 1970s China's sex ratio remained very close to 106. Since the introduction of the OCP in 1979 the sex ratio has increased to over 113. That is an extra 13 boys for every 100 girls born.



**Figure 3** Sex ratios by birth cohort. (Source: Replicated from Fig 1 in Li *et al.* (2011). Calculated based on the 1990 Chinese population census (1% sample).)

The OCP, in concert with the strong cultural preference for sons and the availability of gender selection technology such as ultrasound scans and induced abortion, is widely believed to be the major reason for the increase in the sex ratio (Ebenstein, 2010; Das Gupta 2005; Zeng *et al.*, 1993), and various studies have sought to quantify the policy’s impact. It has been estimated that in excess of 40 million women are ‘missing’ in China (Klasen and Wink, 2002). Li *et al.* (2011) use minority groups who are not subject to the OCP as a control group and estimate that the policy led to 4.4 extra boys per 100 girls in the 1980s, and to 7.0 extra boys per 100 girls for the period 1991–2005. This corresponds to approximately 94% of the total increase in the 1980s and about 55% for 1991–2005. Bulte *et al.* (2011) use a similar methodological strategy to identify the policy’s impact and attribute 50% of the missing women to the policy. As with the policy’s impact on population size, and because China was experiencing substantial change over this period with economic and other reforms accompanying the introduction of the OCP, there is some ongoing debate as to the extent to which the OCP is responsible. Other explanations put forward to explain increasing sex ratios include increasing gender wage gaps due to changes in centrally determined agricultural crop procurement prices (Qian, 2008) and land reform (Almond *et al.*, 2013). Oster (2005) argued that Hepatitis B infection is associated with an increased probability of giving birth to a son and so could potentially explain the sex ratio imbalance. This point was, however, disputed by Das Gupta (2008) on the basis of Lin and Luoh (2008)’s finding that Hepatitis B only increased the probability of having a boy fractionally in a large medical data set for Taiwan. Oster *et al.* (2010) subsequently also found no increases in the probability of having a boy associated with Hepatitis B prevalence in China and conceded that the disease did not drive the increases in China’s sex ratio.

The sex ratio imbalance has serious consequences. Guilмото (2012) estimates that the number of prospective grooms will exceed the number of prospective brides by more than 50% for at least three decades. The number of unmarried men at age 50 is estimated to peak at 15% in 2055. The excess of men has resulted in women

marrying older men and a lesser education gap between men and women. To increase marriageability, families with boys are increasing their savings (Wei and Zhang, 2011). Some men will not be able to find partners though, regardless of how much savings they have. Das Gupta *et al.* (2010) project that unmarried males will likely be concentrated in poorer provinces with lower ability to provide social protection to their citizens and predict that such geographic concentration of unmarried males could be socially disruptive. Indeed, Edlund *et al.* (2013) find that increases in the sex ratio account for almost 15% of the recent large increases in crime rates in China.

As egregious as sex-selective abortion and female infanticide are, females who survive beyond infancy are benefitting from their scarcity in some ways. The high sex ratio gives women greater bargaining power within the household, which consequently results in them bearing fewer children and investing more heavily in children's health (Porter, 2007). Higher sex ratios are also associated with married women being less likely to live with their in-laws Li (2012). Lee (2011) finds that the OCP has reduced the gender education gap, as girls who are only children are no less likely to be educated than boys who are only children. Ultimately son preference will diminish as parents prefer to have a girl who they will be able to marry off rather than a boy with worse marriage prospects, Edlund (1999).

### *Behavioural consequences*

Over the past 30 years the OCP is felt to have had a marked impact on the behaviour of the one-child generation. There are claims in the media as well as some psychologists that this new generation could be different (see, for example, Lee (1992), Fan (1994) and Wang *et al.* (1998)). People are concerned that parents have not been teaching their only children traditional values and that the children of the one-child generation are more self-centred and less cooperative than previous generations. This sentiment is captured in the common phrase that the only child is the 'little emperor' of the family. As the first cohorts of the one-child generation entered the labour market, employers started to include phrases such as 'no single children need apply' in job ads (see Chang, 2008).

Empirical evidence of these behavioural differences is limited. Results of studies that compare only children with others produce mixed results (Chen and Goldsmith, 1991; Falbo and Poston, 1993; Shen and Yuan, 1999; Wang *et al.*, 2000; Liu *et al.*, 2005). These comparisons are, however, unlikely to be a comparison of like with like, as they ignore that families who are able to have more than one child under the OCP are often substantially different from families who have had to comply with the policy. A comparison of people (whether only children or otherwise) born just before and just after the introduction of the OCP in 1979 avoids this problem, as for the majority of the population having more than one child was no longer a choice after the policy's introduction. Such a comparison was conducted by the authors (and their co-authors) in Beijing in 2010. Personality surveys and economic experiments designed to elicit the extent of pro-social and other behaviours revealed strong behavioural differences, largely in line with the anecdotal reports – the OCP was found to have produced a less trusting, less trustworthy, more risk-averse, less competitive, less conscientious, more pessimistic and more neurotic generation (Cameron *et al.*, 2013).

## *Economic consequences*

The overall economic impact of the OCP is very difficult to determine. On the one hand, the policy has reduced the country's stock of labour and generated a heavy burden on the younger generation, as only children struggle to support their parents and four grandparents financially. Entrepreneurial spirit has also possibly been sapped as the result of the generation's reduced willingness to take risks (Cameron *et al.*, 2013). On the other hand, the policy seems to have stimulated saving, although recent studies have found that the general equilibrium effect of the OCP on savings could be small (Banerjee *et al.*, 2011, 2014; Choukhmane *et al.*, 2013). Investment in education for both genders has also increased (Rosenzweig and Zhang, 2009). Zhu *et al.* (2013) argue that the demographic changes caused by the OCP may not harm China's long-term growth. Their model, which focuses largely on fertility decreases coupled with increased educational attainment, estimates that by 2025 China's GDP will be about 4% higher than it would have been without the OCP.

## **Potential implications of policy changes**

In late 2013 China announced that it was relaxing its OCP. Couples in which at least one is an only child will now be allowed to have two children.

The government predicts that the relaxation of the policy will be associated with a significant increase in the total birth rate in the initial stage to above 1.8, but in the long run the birth rate is estimated to settle at around 1.6 to 1.7 (*People's Daily*, 2013). The relaxation of the OCP is unlikely to have a large impact on population size for the following reasons:

1. Currently, 70% of the Chinese population has rural household registration (*hukou*), and for these people the OCP was never binding. The majority of rural *hukou* households have two or more children and hence for them the new policy will not have an effect.
2. For the remaining urban *hukou* population (30%) the past thirty years of economic growth has likely changed people's fertility preferences. This change in fertility preferences reflects that the majority of urban women are going to university and hence delay their first birth and have a shorter period in which they wish to bear children. Further, the cost of rearing children has risen sharply in cities.

Many demographic studies support the second point. For example, Cai (2010) uses differences in the implementation of the family planning policy in two economically fairly developed provinces, Zhejiang and Jiangsu, as a natural experiment to examine the effect of the OCP versus a policy which allows for two children on the total fertility rate. He finds that despite the differences in the family planning policy, the total fertility rate is similar across the two provinces, suggesting that economic growth has dominated individuals' fertility behaviour.

If the relaxation of the OCP does not have a large effect on the population size in the long run, it will also not have a large effect on the aging of the population. The official government view however is that it will improve the age structure of the Chinese population. The *People's Daily* reports that the change in policy will gradually reduce the share of the aging population, so that by 2100 34.3% of the

population are elderly, compared to 39.6% of the population in the absence of any policy change (*People's Daily*, 2013).

The changes in the OCP promise to reduce the sex ratio and some of the associated consequences described above. Parents living in urban areas who were subject to the strict one-child version of the policy and who may have aborted a first child daughter are now likely to resort to sex selectivity only if the first two children are daughters. As discussed above, most rural areas already allowed couples whose first child was a daughter to have a second child. This is often referred to as the '1.5 rule'. Zeng (2007) shows that sex ratios are higher in 1.5 child areas than 2 child areas. He found the sex ratio at birth in 2000 in areas where there are '1.5 children' rules to be 119.7, compared to 108.3 in 2 child policy areas (see also Goodkind, 2011).

The decline in the sex ratio at birth will, with time (approximately two decades), relieve the stress in the marriage market and reverse many of the phenomena described above – men will start being able to marry at younger ages. Female labour supply may increase as a result of reduced female bargaining power. There may be adverse effects on resources devoted to children. Some changes are, however, unlikely to be reversible, as cultural norms will have shifted irretrievably. This is probably true of son preference, which has weaker foundations in a modern economy in which wages are rising in the female-dominated service sector relative to manufacturing and blue collar jobs. Market forces are also likely to counter any reductions in investment in the human capital of girls. A smaller pool of unmarried men is likely to have positive impacts on social cohesion.

The extent to which the behavioural impacts of the policy can be ameliorated by the policy's relaxation will depend on its impact on fertility. If one-child families remain the norm, the behavioural tendencies identified by Cameron *et al.* (2013) can be expected to persist, unless they are offset by specific educational and institutional efforts. The increasing marketization of society is further eroding pro-social values, so those who wish for a return to a society of traditional values are likely to be disappointed.

## See Also

- China, economics in;
- Chinese economic reforms;
- demographic transition;
- Maoist economics;
- population ageing

## Bibliography

Almond, D., Li, H. and Zhang, S. 2013. Land reform and sex selection in China. *NBER Working Paper* No. 19153, pp. 1–52.

Banerjee, A., Meng, X. and Qian, N. 2011. The life cycle model and house-hold savings: micro evidence from urban China. *Unpublished Manuscript*, Yale University.

Banerjee, A., Meng, X., Porzio, T. and Qian, N. 2014. Aggregate fertility and household savings: a general equilibrium analysis using micro data. *NBER Working Paper* No. 20050.

Banister, J. 1987. *China's Changing Population*. Stanford University Press, Palo Alto, CA.

Bulte, E., Heerink, N. and Zhang, X. 2011. China's one-child policy and 'the mystery of missing women': ethnic minorities and male-biased sex ratios. *Oxford Bulletin of Economics and Statistics*, 73(1): 21–39.

Cai, Y. 2010. China's below-replacement fertility: government policy or socioeconomic development? *Population and Development Review*, 36(3): 419–40.

Cameron, L., Erkal, N., Gangadharan, L. and Meng, X. 2013. Little emperors: behavioral impacts of China's one child policy. *Science*, 339: 953–7.

Center for Population Studies, Chinese Academy of Social Sciences & Editorial Board of the China's Population Yearbook. 1986. The major events of China's population activities. *China's Population Yearbook (1985)*. Chinese Social Sciences Press, Beijing. pp. 1263–88.

Chang, L. 2008. *Factory Girls: From Village to City in a Changing China*. Spiegel and Grau, New York.

CHARLS Research Team 2013. Challenges of population aging in China: evidence from the National Baseline Survey of the China Health and Retirement Longitudinal Study (CHARLS), unpublished report: [http://charls.ccer.edu.cn/uploads/document/public\\_documents/application/Challenges-of-Population-Aging-in-China-final0916.pdf](http://charls.ccer.edu.cn/uploads/document/public_documents/application/Challenges-of-Population-Aging-in-China-final0916.pdf)

Chen, J. and Goldsmith, L. T. 1991. Social and behavioral characteristics of Chinese only children: a review of research. *Journal of Research in Childhood Education*, 5(2): 127–39.

Choukhmane, T., Coeurdacier, N. and Jin, K. 2013. The one-child policy and household savings. *LSE Working Papers*, London School of Economics.

Das Gupta, M. 2005. Explaining Asia's 'missing women': a new look at the data. *Population and Development Review*, 31: 529–35.

Das Gupta, M. 2008. Can biological factors like Hepatitis B explain the bulk of gender imbalance in China? A review of the evidence. *World Bank Research Observer*, Fall, 23(2): 201–17.

Das Gupta, M., Ebenstein, A. and Sharygin, E. 2010. China's marriage market and upcoming challenges for elderly men. *World Bank Policy Research Working Paper* No. 5351, World Bank, Washington D.C.

- Ebenstein, A. 2010. The 'missing girls' of China and the unintended consequences of the one child policy. *Journal of Human Resources*, 45(1): 87–115.
- Edlund, L. 1999. Son preference, sex ratios, and marriage patterns. *Journal of Political Economy*, 107(6): 1275–304.
- Edlund, L., Li, H., Yi, J. and Junsen, Z. 2013. Sex ratios and crime: evidence from China. *Review of Economics and Statistics*, December, 95(5): 1520–1534.
- Falbo, T. and Poston, D. 1993. The academic, personality, and physical outcomes of only children in China. *Child Development*, 64(1): 18–35.
- Fan, C. 1994. A comparative study of personality characteristics between only and non-only children in primary schools in Xian. *Psychological Science*, 17(2): 70–4 (in Chinese).
- Feeney, G. and Wang, F. 1993. Parity progression and birth intervals in China: the influence of policy in hastening fertility decline. *Population and Development Review*, 19 (1): 61–101.
- Feeney, G., Wang, F, Zhou, M. and Xiao, B. 1989. Recent fertility dynamics in China: results from the 1987 one percent population survey. *Population and Development Review*, 15(2): 297–322.
- Goodkind, D. 2011. Child underreporting, fertility, and sex ratio imbalance in China. *Demography*, 48: 291–316.
- Guilmoto, C. 2012. Skewed sex ratios at birth and future marriage squeeze in China and India, 2005–2100. *Demography*, 49: 77–100.
- Kane, P. and Choi, C. 1999. China's one child family policy. *British Medical Journal*, 319(7215): 992–4.
- Klasen, S. and Wink, C. 2002. A turning point in mortality? An update on the number of missing women. *Population and Development Review*, 28: 285–312.
- Lee, L. 1992. in *Child care in context: cross cultural perspectives*, M. E. Lamb, K. Sternberg, (eds.) (Lawrence Erlbaum, Hillsdale, NJ), pp. 355–392.
- Lee, M.-H. 2011. The one-child policy and gender equality in education in China: evidence from household data. *Journal of Family Economics Issues*, 33: 41–52.
- Li, Q. 2012. The effects of sex ratio imbalance in China. *Population Association of America Meeting*, 3–5 May, San Francisco, CA.
- Li, H., Yi, J. and Zhang, J. 2011. Estimating the effect of the one-child policy on the sex ratio imbalance in China: identification based on the difference in differences. *Demography*, 48: 1535–57.

Lin, M.-J. and Luoh, M.-C. 2008. Can hepatitis B mothers account for the number of missing women? Evidence from three million newborns in Taiwan. *American Economic Review*, 98: 5, 2259–73.

Liu, C., Muakata, T. and Onuoha, F. 2005. Mental health condition of the only-child: a study of urban and rural high school students in China. *Adolescence*, 40: 831–45.

Oster, E. 2005. Hepatitis B and the case of missing women. *Journal of Political Economy*, 113(6): 1163–216.

Oster, E., Chen, G., Yu, X. and Lin, W. 2010. Hepatitis B does not explain male-biased sex ratios in China. *Economics Letters*, 107:142–4.

Peng, X. 1991. *Demographic Transition in China*. Clarendon Press, Oxford.

*People's Daily*. 2013. The adjustment in family planning policy will change share of ageing population, labour and public resources demand and supply (in Chinese). [http://paper.people.com.cn/rmrb/html/2013-11/18/nw.D110000renmrb\\_20131118\\_1-02.htm](http://paper.people.com.cn/rmrb/html/2013-11/18/nw.D110000renmrb_20131118_1-02.htm)

Porter, M. 2007. The effects of sex ratio imbalance in China on marriage and household bargaining. *Working Paper*. University of Chicago, Chicago, IL.

Qian, N. 2008. Missing women and the price of tea in China: the effect of sex-specific earnings on sex imbalance. *Quarterly Journal of Economics*, 123: 1251–85.

Rosenzweig, M. and Zhang, J. 2009. Do population control policies induce more human capital investment? Twins, birth weight and China's 'one-child' policy. *Review of Economic Studies*, 76(3): 1149–74.

Shen, J. and Yuan, B. J. 1999. Moral values of only and sibling children in mainland China. *Journal of Psychology: Interdisciplinary and Applied*, 1331: 115–24.

Wang, F. 2011. The future of a demographic overachiever: long-term implications of the demographic transition in China. *Population and Development Review*, 37(suppl.): 173–90.

Wang, F., Cai, Y. and Gu, B. 2012. Population, policy, and politics: how will history judge China's one-child policy? *Population and Development Review*, 3(suppl.): 115–29.

Wang, Q., Leichtman, M. D. and White, S. H. 1998. Childhood memory and self-description in young Chinese adults: the impact of growing up an only child. *Cognition*, 69: 73–103.

Wang, D., Kato, N., Inaba, Y., Tango, T., Yoshida, Y., Kusaka, Y., Deguchi, Y., Tomita, F. and Zhang, Q. 2000. Physical and personality traits of preschool children in Fuzhou, China: only children vs sibling. *Child: Care, Health and Development*, 26(1): 49–60.

Wei, S. and Zhang, X. 2011. Sex ratio imbalances stimulate savings rates: evidence from the missing women in China. *Journal of Political Economy*, 119(3): 511–64.

Yang, K., Chen, S. and Wei, J. (eds.) 2000. *China's Birth Planning: Benefits and Inputs* (in Chinese). People's Press, Beijing.

Zeng, Y., Ping, T., Gu, B., Xu, Y., Li, B. and Li, Y. 1993. Causes and implications of the recent increase in the reported sex ratio at birth in China. *Population and Development Review*, 19: 283–302.

Zeng, Y. 2007. Options for fertility policy transition in China. *Population and Development Review*, 33: 215–46.

Zhang, J. and Sturm, R. 1994. When do couples sign the one-child certificate in urban China? *Population Research and Policy Review*, 13(1): 69–81.

Zhang, K. D., 2000. *Textbook on the Elderly Law*. China Encyclopedia Press, Beijing.

Zhu, X., Whalley, J. and Zhao, X. 2013. Intergenerational transfer, human capital and long-term growth in China under the one child policy. *NBER Working Paper* No. 19160, June.