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# Fiscal decentralization and China's regional infant mortality

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**Abstract**

Regional Chinese infant mortality rates (IMRs) are examined using a stochastic frontier method for the first time. The composite error term method yields estimates of large underreporting of IMRs over time and provinces in China during the past 30 years. China does not follow the standard growth paradigm of more growth leading to lower IMRs. Fiscal decentralization has not alleviated the problem of high IMRs. Both IMRs and the sex ratio at birth suggest reported data constitute a floor or minimal level of demographic distress across provinces with millions of missing females not fully included in the data. China's one-child policy leads to not only underreporting by families but also reporting abuse by local officials who want to be promoted. The *hukou* system and unbalanced government development policies exacerbate the issue.


*JEL classification:* J11; O23; O53; P25

*Keywords:* Infant mortality; China's regions; Fiscal decentralization

## 1. Introduction

While China is similar to other countries by having a negative long-run causal relationship between per capita income and population growth (Hasan, 2010), they have supplemented the need to lower population with the well-known one child per family policy. The policy has impacted the

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infant mortality rate (IMR) that has long been used as key measure of the economic development of a country. In China, infant mortality has been suspected of being underreported for many decades given a historic bias towards male births. However, after the Communist revolution infant mortality rate and the bias towards male births appeared to fall (Coale & Banister, 1996). More recently, the strict one child per family legislation and improved abortion/ultra sound methods have led to a rise in the sex ratio to levels suggesting the bias towards male births has returned (Coale & Banister, 1996). Indeed, the one-child policy has led to millions of females aborted according to the most recent (2005) mini census (Ridley, 2012) and over-reporting of twins that do not actually exist (Huang, Lei, & Zhao, 2014). Infant mortality in middle income countries is most likely to be underreported in general (Anthopolos & Becker, 2010), and China as a middle income country with a strict population control policy in a society biased toward male births is therefore quite likely to have high IMR underreporting. Underreporting suggests that the true IMR is consistently above the reported rate of IMR variation across time and provinces in China including very recent censuses (e.g., for the 2010 census, see Du & Zhang, 2014; Zhao & Yang, 2013).

While the stochastic frontier method (SFM) has been applied to cost and production functions for many years (e.g. Bauer, 1990; Fare & Grosskopf, 2005), it has only recently been considered in explaining infant mortality (Anthopolos & Becker, 2010) and never within China. The SFM with a one-sided error is applied with the assumption that the reported IMR is much lower than the true IMR resulting in a one-sided "frontier" that, if underreporting did not happen, would represent a true IMR frontier. Such a frontier would still be subject to random noise, but cannot be modeled using an OLS average function ignoring the one-sided underreporting. A province with relatively little underreporting would form the frontier as a "best practice" region that may still have a high IMR by world standards. As our analysis will compare provinces within China only, the frontier analyzed here cannot be used to compare relative regional reporting performance with other countries. Section two discusses the literature. Section three outlines the method and data. Section four presents the results and section five concludes.

## 2. Literature review

There have been a number of studies that explored IMR underreporting and missing women for China. Traditional Confucian philosophy reflected in the "San Cong Si De" saying of three obediences and four virtues gave women no rights as possessions of men for thousands of years. After the revolution in 1949, legal gender equality in the workplace did not stop the discrimination and unusually high female mortality rate (Jiang, Li, Feldman, & Barricarte, 2012). Wolf and Huang (1980) attribute the female infant mortality to infanticide and abandonment because of male preference. Banister (1987) identifies several sources of underreporting such as unlikely reporting of infant deaths when the deaths happen in the first week of life, infanticide, stringent fertility targets, sex-selective underreporting due to one-child policy etc. while Das Gupta and Li (1999) compare China's experience with some other Asian countries. Sen (1990) estimates 100 million women missing in China using a normal sex ratio at birth and non-gender-biased mortality. His work is modified by Klasen and Wink (2002) who include overall health conditions as well. More recently, Bulte, Heerink, and Zhang (2011) cited a figure of 40 million missing women and held the one-child policy responsible for 50% of them. Coale and Banister (1994) found that Chinese parents have changed from selecting sons via infanticide and abandonment of female babies by the use of ultrasound B. Cao and Wang (2010) document the threat of high IMRs to small ethnic groups and the consequent loss of racial and cultural diversity. Wei and