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# Sources of China's economic growth 1952–1999: incorporating human capital accumulation

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## Abstract

China's economic growth has been remarkable since the reform started in 1978. There is an ongoing debate about whether this performance is driven mainly by productivity growth or by factor accumulation. But few past studies taken human capital into account, and thus contained an omission bias. In this paper, we construct a measure of China's human capital stock over 1952–1999 and employ it in our growth accounting exercise. We find that, first, in China, the accumulation of human capital was quite rapid and it contributed significantly to growth and welfare; second, after incorporating human capital, the growth of total factor productivity (TFP) still played a positive role in GDP growth in the reform period, while it was negative in the prereform period. These results are robust changes in labor shares in GDP and in depreciation rates. An implication is that a high priority should be given to human capital accumulation and productivity growth, if China is to sustain its growth and welfare improvement in the next decade.

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## 1. Introduction

Few would argue about China's extraordinary growth performance since reforms started in 1978, but the sources of the growth have been the subject of a heated debate. This paper contributes to this debate by investigating the determinants of China's growth

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over 1952–1999 using a simple growth-accounting framework that incorporates human capital stock. By constructing a measure of human capital stock and comparing the growth experiences of the prereform and reform periods, we try to shed light on the relative importance of factor accumulation (physical capital, labor, and human capital) and the growth of total factor productivity (TFP).

The ongoing debate focuses on whether China's rapid growth during the reform period is driven mainly by productivity growth or by factor accumulation. On one side, many researchers conclude that productivity growth has played a significant role (for example, [Chow, 1993](#); [Borensztein & Ostry, 1996](#); [Hu & Khan, 1997](#)). In particular, Chow contends that capital formation played a principal role in China's economic growth, while there was nearly no technological progress from 1952 to 1980. The other two growth-accounting studies cited above find that, during the reform period after 1978, the role of capital accumulation was only secondary, with productivity growth becoming the primary driving force of China's rapid economic growth. For example, [Borensztein and Ostry \(1996\)](#) conclude that the growth rate of TFP, which was negative before reform, rose to 3.8% per year in the postreform period, accounting for more than one-third of the total increase in output.

On the other side, [Krugman \(1994\)](#) argues that China will face a limit on growth sooner or later, since it depends heavily on a massive increase in input with only small improvement in productivity, as in the case of East Asian economies. Moreover, [Young \(2000\)](#), claims that the productivity performance of China's nonagricultural sector during the reform period is, while respectable, not outstanding. More specifically, he finds that systematic understatement of inflation by enterprises accounts for 2.5 percentage points of growth per annum in the nonagricultural sector during the reform period (1978–1998). The usual suspects—rising participation rates, improvements in educational attainment, and the transfer of labor out of agriculture—account for most of the remainder. As such, it is possible to recast the recent growth experience of China from the extraordinary to the mundane.

In this paper, we construct a new time series of China's stock of human capital and use it in our growth accounting exercise. The studies by [Borensztein and Ostry \(1996\)](#), [Chow \(1993\)](#), and [Hu and Khan \(1997\)](#) do not incorporate human capital as an input in their aggregate production function for the Chinese economy. Thus, their measurement of productivity growth suffers from an omission bias and the estimated productivity as residual is exaggerated. Further, our approach to constructing the human capital stock is different from that of other studies that have constructed such a series. In particular, our series covers a longer period than the previous studies and uses a different flow variable. Our data set on educational attainment provides annual measures of the human capital stock for the Chinese economy for the prereform period 1952–1977 and the reform period 1978–1999. The flow variable we used is the number of graduates completing different schooling levels, rather than enrollment figures at 5-year intervals. [Young's \(2000\)](#) estimation of human capital growth has several shortcomings: He disaggregates the labor force into various categories based on the infrequent population census data. In addition, he weights each type of workers by the wage of that type, using the Household Survey files covering a smaller period (1986–1992) than his analysis period (1978–1998). Therefore, the human capital growth he obtains is not an

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