Entrepreneurship, Institutions, and Regional Development: Evidence from China’s Economic Transition, 1978-2017
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Abstract. Using a panel of China’s 31 provinces over 1978-2017, we examine the effects of entrepreneurship on economic growth in the context of China’s transformation from a centrally planned to a market-oriented economy. We divide entrepreneurship into two types: business creation and innovation. Our panel data estimation results show that both types of entrepreneurship have significantly positive effects on growth rate of China’s GDP per capita over the sample period. Specifically, annual growth rate of GDP per capita will increase by 1.625 percentage points if business creation entrepreneurship increases by ten percentage points. Innovation has a lag impact on economic growth. Annual economic growth rate will increase by 0.188 percentage points if innovation in the last period increases by ten percent. The results are robust even when we control for different sets of independent variables. China’s transition and development experience show that a strong government does not conflict with the role of entrepreneurs and free markets.

JEL Classification: L26, O15, O53

Introduction

We are to examine whether entrepreneurship, measured by business creation and innovation in our paper, has played an important role in China’s economic growth over the past four decades in an authoritarian political regime. It is generally recognized that entrepreneurial activity is one of the primary drivers of industrial dynamism, economic development, and growth. Entrepreneurship is central to the functioning of market economies. Joseph A. Schumpeter may be the first economist who focuses on the role of entrepreneurship in economic development. He argues that entrepreneurs drive economic growth by undertaking risky ventures that create and introduce new goods, services, and production processes that displace old businesses [1]. Some claim that the main impediment to China’s industrialization during the Song Dynasty (A.D. 960-1270) was a social system that inhibited entrepreneurship, and that is why medieval China stagnated economically [2]. Most theoretical studies suggest that entrepreneurship is of critical importance to the long-run sustainable growth of an economy, among which Porter (1990) even claims that entrepreneurship is “at the heart of national advantage.[3]”

It has now been quite some time that researchers have been confronting real data with ideas. Empirical evidence and the lessons of experience both seem to confirm the role of entrepreneurship in growth. Although Bosma et al. (2018) claim that “there is very little evidence on the impact of entrepreneurship on growth, [4]” we still find many insightful studies in the literature. Initially, much of this work was conducted on the basis of the data of the developed industrialized countries (Data availability may have had a significant role in this choice of sample). As more wide-ranging data sets become available, empirical regularities of the entrepreneurship-growth relationship in transition and developing economies start to draw the attention of researchers. For example, using China’s provincial-level data over 1983-2003, Li et al. (2009) conclude that entrepreneurship significantly promotes economic growth [5].

Inspired by the theoretical insights and empirical findings in the literature, we are to examine the role of entrepreneurship in China’s economic growth by using the provincial-level panel data of
China over 1978-2017. China’s transition from a bureaucratic central planning to a private market starts from 1978 and that’s why our sample data set starts also from that year. As officially worded, Chinese economy was on the verge of collapse in 1978 after two decades of central planning and political movements. Then from 1978 to 2017, China had enjoyed substantial economic growth. Its GDP had been growing at an average annual rate of 9.5 percent over this period, which was historically unprecedented. It is widely recognized that the Chinese government has been playing a fairly proactive role in the economic transition and development since 1978. While in this period numerous entrepreneurs have emerged and started their businesses. By the end of 2017, the number of self-employed individuals and people employed in private enterprises (both urban and rural areas) accounted for 44 percent of the total number of employed persons in China, while the number was less than 4 percent in 1990. Before 1989 there were even no officially registered private enterprises in mainland China. In a sense, China’s economic reform since 1978 is a transformation from the extreme of total collectivism to greater reliance on individual initiative (entrepreneurship) and voluntary cooperation (free market). The transformation converts economic stagnation into rapid growth.

The Econometric Model

Based on conventional growth equations, we construct the following fixed-effects model:

\[
\log\left( \frac{y_{it}}{y_{i0}} \right) = \beta_1 \log(y_{i0}) + \beta_2 \text{Entrepreneurship}_{it} + \beta_3 \log(n_{it} + g + \delta) + \beta_4 \log(\text{investment}_{it}) + \beta_5 \log(\text{government}_{it}) + \beta_6 \log(\text{loan}_{it}) + \beta_7 \log(\text{education}_{it}) + \beta_8 \log(\text{FDI}_{it}) + \beta_9 \log(\text{road}_{it}) + \eta_i + \tau_t + \epsilon_{it}
\]

(1)

We break the entire sample period (1978-2017) into eight sub-periods, i.e., 1978-1982, 1983-1987, 1988-1992, 1993-1997, 1998-2002, 2003-2007, 2008-2012, and 2013-2017. \( \log(y_{it}) \) is the natural log of the end-year real GDP per capita in each sub-period, and \( \log(y_{i0}) \) is the natural log of the beginning-year real GDP per capita in each sub-period. Therefore, the dependent variable in Eq. (1), \( \log(y_{it}/y_{i0}) \), log difference of the per capita income, is the four-year growth rate of GDP per capita in each sub-period. Entrepreneurship\(_{it}\) is the average value of entrepreneurship in each sub-period; \( \eta_i \) stand for unobserved region-specific fixed effects, which are time invariant. \( \tau_t \) are period-specific intercepts, which may capture productivity changes that are common to all regions. \( \eta_i \) and \( \tau_t \) may also reflect region-specific and period-specific components of measurement errors. \( \epsilon_{it} \) are idiosyncratic disturbances or observation-specific errors. The rest independent variables all take average values in each sub-period. The subscripts \( i \) and \( t \) indicate province \( i \) and period \( t \), \( i=1, 2, \ldots, 31 \), and \( t=1, 2, \ldots, 8 \). So we will have 248 observations for each variable if no data are missing.

The control variables in Eq. (1) are explained as follows.

(1) \( \log(n_{it} + g + \delta) \), \( n_{it} \) is the exogenous growth rate of the labor force in each period (assumed to equal the population growth rate), \( g \) is the exogenous rate of technical progress, and \( \delta \) is the depreciation rate. We assume that \( g + \delta = 0.05 \). The growth of population in China over the past four decades is also affected by Chinese government’s “one-child policy,” which started from 1979 and ended in 2016. This is an exogenous policy change.

(2) \( \log(\text{investment}) \), which is the natural log of fixed asset investment as a share of GDP.

(3) \( \log(\text{government}) \), which is the natural log of government budget expenditures as a share of GDP and used as a proxy for government size. We control for government size with an aim to check whether a bigger (or smaller) government is more conducive to economic growth. Of course, researchers do so in the literature as well.
(4) log(loans), which is the natural log of bank loans as a share of GDP. This is to measure the role of finance in economic development.

(5) log(education), which is the natural log of university student enrollments per 10,000 people. This is to measure the role of human capital in economic growth. Measures of human capital have always been a weak spot in growth empirics. Here, we use the number of university enrollments per 10,000 people to measure human capital. In the literature, other measures are also used. We include human capital into the regression equation not only because many authors do so in the literature, but also because the Chinese government significantly expanded university enrollment rate in the late 1990s. This is an exogenous policy change as well.

(6) FDI, which is foreign direct investment actually utilized as a share of GDP. The role of FDI in China’s economic growth has been widely confirmed in the literature.

(7) log(road), which is the natural log of the length of paved road per 10,000 square kilometers of land. This is to measure the role of infrastructure in economic growth. A survey of Nigerian entrepreneurs finds that poor transportation infrastructure and a lack of dependable utilities are leading constraints to firm growth [6].

The Data

The data used in this paper are from China Compendium of Statistics 1949-2008 and China Statistical Yearbook (relevant years). The data set includes 31 provinces of mainland China over 1978-2017 (i.e., except Hong Kong, Macau, and Taiwan). We start from 1978 because that year marks China’s economic transition (reform and opening-up in official wording). We choose this period because the transition since 1978 had brought dramatic changes to China. Under a centrally planned society before 1978, there was little role of entrepreneurs. Actually, whether entrepreneurs play an important role in the economy embodies a key difference between a centrally planned society and a capitalist one. As transition economies moved from centralized economies to market economies, enterprise and entrepreneurship became important.

Panel Data Estimation Results

The results are presented in Table 1. The estimates of innovation entrepreneurship basically remain unchanged. These estimates are all statistically significant at 1 percent level in Table 1.

Table 1. Effects of Business Creation and Innovation on Economic Growth.

| Independent variables | Dependent variable: log(y_{it}/y_{i0}) |
|-----------------------|---------------------------------------|
|                       | (1)                                  | (2) | (3) |
| log(y_{i0})           | -0.09**                              | -0.13*** | -0.18*** |
|                       | (-2.13)                              | (-5.89) | (-13.7) |
| business              | 0.002***                             | 0.002*** | 0.002*** |
|                       | (2.73)                               | (3.01) | (3.02) |
| L.log(innovation)     | 0.03***                              | 0.03*** | 0.03*** |
|                       | (6.81)                               | (8.69) | (6.37) |
| log(n + g + δ)        | -0.06***                             | -0.06*** | -0.06*** |
|                       | (-5.33)                              | (-4.64) | (-4.58) |
| log(investment)       | 0.18***                              | 0.17*** | 0.14*** |
|                       | (14.9)                               | (8.93) | (11.3) |
| log(loans)            | -0.05***                             | -0.05*** | -0.04*** |
|                       | (-4.04)                              | (-3.85) | (-2.86) |
| log(government)       | -0.04                                | -0.06  |
|                       | (-0.68)                              | (-1.09) |
| log(education)        | 0.03                                 | 0.06*** |
|                       | (1.24)                               | (3.23) |
| FDI                   | 0.007***                             |       |

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As a second step of robustness check, we use GMM method to solve the possible endogeneity problem of the independent variables. Entrepreneurship may be endogenous in the regression equation. Differencing cannot rule out the potential simultaneous bias of the entrepreneurship variable. In China more developed regions are associated with more entrepreneurship. More entrepreneurs concentrate in more developed regions. How can we make sure that this relationship is causal and not a mere coincidental correlation? The most commonly used method is to find an IV for the possible endogenous explanatory variable. An IV must satisfy two properties: (i) it must be relevant, partially correlated with the endogenous explanatory variable; (ii) it must be exogenous, that is, uncorrelated with the error term of the structural equation.

To solve the endogeneity problem of the entrepreneurship variable, in the present paper we use “urban SOEs employment as a share of total urban employment 25 years ago” as an instrument for entrepreneurship (i.e., over 1953-1992). For example, the IV for entrepreneurship in 2017 is the SOE employment share in total urban employment in 1992, and so on. In China, for historical reasons (geographical considerations or resource endowments considerations), provinces differ in their share of SOE sector. For example, many SOEs were built in southwest China over 1960s-1980s out of strategic considerations—preparation for wars with the former Soviet Union or the United States. Many SOEs were built in northeast China because that areas were richly endowed with natural resources like wood, coal, and oil. These initial SOE differences drive the different levels of entrepreneurship today. Entrepreneurship had no room to develop in a region where SOEs dominated the local economy, such as northeast China. It would be enough for SOE managers to routinely carry out government production plans. Under such a system, people’s incentive of starting businesses or innovating was greatly constrained and even snuffed out. Conversely, in a region where SOE sector was weak, the local economy had to rely on private sectors, local governments and officials would (have to) be more tolerant of private firms (against the dominating public-ownership ideology), so entrepreneurship would grow and develop, such as Zhejiang province in east China. The different levels of entrepreneurship originated from initial government considerations in establishing SOEs persist today. Therefore, “SOE employment share 25 years ago in urban areas,” as an IV for local entrepreneurship, is relevant. The instrument is exogenous as well: SOE employment share 25 years ago should be uncorrelated with the error term in Eq. (1).

We present the GMM estimation results in Table 2. Both business creation and innovation entrepreneurship show much stronger effects on economic growth rate in Table 2 than that in the preceding tables.
### Table 2. Effects of Business Creation and Innovation on Economic Growth.

| Independent variables | Dependent variable: log($y_{it}/y_{i0}$) |
|-----------------------|----------------------------------------|
|                       | (1)                                   | (2)                                   |
| log($y_{i0}$)         | -0.41*** (-8.86)                      | -0.24** (-2.54)                      |
| business              | 0.0065** (2.38)                       |                                       |
| L.log(innovation)     |                                       | 0.075*** (2.86)                       |
| log($n + g + \delta$)| -0.08** (-2.45)                      | -0.08*** (-3.02)                     |
| log(investment)       | 0.03 (0.39)                           | 0.07 (1.21)                          |
| log(loan)             | -0.09 (-1.27)                         | 0.02 (0.31)                          |
| log(government)       | -0.30*** (-4.55)                      | -0.004 (-0.05)                       |
| log(education)        | 0.16*** (3.08)                        | 0.04 (0.73)                          |
| FDI                   | 0.01** (2.32)                         | 0.02** (2.38)                        |
| log(road)             | 0.24*** (2.95)                        | -0.04 (-0.74)                        |
| Period dummies        | Included                               | Included                               |
| AR(1)                 | 0.006                                 | 0.060                                 |
| AR(2)                 | 0.808                                 | 0.823                                 |
| Hansen test           | 0.153                                 | 0.555                                 |
| Observations          | 175                                   | 145                                   |
| Instruments           | 30                                    | 40                                    |

### Discussions: Entrepreneurship and Institutions

Institutional quality provides an environment conducive to innovation and technology adoption, and more generally an environment that provides individuals with incentives to invest in innovative ideas as well as human and physical capital in order to carve out a better economic future for themselves. When we discuss the role of entrepreneurs and entrepreneurship, we should never neglect the role of institutions in general and government in particular. Although we try to disentangle the role of entrepreneurship from institutions in economic growth, we admit it is difficult (even impossible) to do so, because their roles are intertwined; just like we cannot separate the role of seeds from soil in the crop harvest. Without entrepreneurs, the role of institutions is limited; little happens in economic life. Factors of production do not magically spring into combinations to make economic enterprises. It is the entrepreneur that accomplishes this economic service. Conversely, without ‘good’ institutions and thus ‘right’ incentives, entrepreneurship cannot be made into full play and may even be stifled.

The full play of entrepreneurship needs a free enterprise system. It’s not hard to comprehend that entrepreneurs must play a negligible role under a centrally planned economic system, because under such a system a bureaucracy is there for everything. Planned economy relies on strong state intervention and persistent market distortions to sustain its viability—thus often crowding out or thwarting altogether the traditional and important role of the entrepreneur. The workforce is assumed to be fully employed and wages are predetermined. Missing is the ultimate consumer, who in a centrally planned economy is assumed to passively accept the goods planning agencies order produced.’ Missing also are entrepreneurs, because prices don’t transmit information on market...
demand and supply and people have no incentive to act on that information in a centrally planned economy. Moreover, the whole ideology centers on the alleged exploitation of labor under capitalism. By this ideology, private commerce and industry are considered low-status activities, not fit for a respectable person. If entrepreneurship is one of the engines of economic growth, then no wonder that centrally planned economies have great difficulty in raising standards of living and creating wealth, no wonder the inefficiencies that have resulted from the command system are ubiquitous, and no wonder the communist countries have experienced economic stagnation and political repression and thus failed in practice. Also, the feudal system dominating in Europe in the Middle Ages hampered the development of entrepreneurship and innovation. In the United States, that new business formation plays an increasing role in converting new knowledge into economic growth since 1980 is because of a number of institutional reforms, such as strengthening of intellectual property rights, the enactment of the Bayh-Dole Act, changes in tax laws, and deregulation of financial institutions.

Therefore, when we talk about the role of entrepreneurs, we must be clear of the institutions in which they are living. Entrepreneurs need an environment in which they are free to experiment with new businesses and innovations—at their risk if the experiment fails, and to their profit if it succeeds. And they need clear price signals to adopt those methods of production that are least costly and thereby use available resources for the most highly valued purposes. Anything that prevents prices from expressing freely the conditions of demand or supply interferes with the transmission of accurate information and thus hampers the functioning of entrepreneurs. For example, one of the major adverse effects of erratic inflation is the introduction of static into the transmission of information through prices. Government, of course, is to blame for inflation. Therefore, the government must provide an environment in which private property is well protected and free market is well safeguarded (including keep inflation low and stable). This may be taken for granted in industrialized nations but worth emphasis in a transition economy like China, because both private property and free markets were largely absent before its transition.

Conclusion

Based on China’s provincial-level panel data over 1978-2017, we include entrepreneurship into the growth regression model and explore the impact of entrepreneurship on economic growth. We further decompose entrepreneurship into business creation entrepreneurship and innovation entrepreneurship. The regression results show that over our sample period both business creation entrepreneurship and innovation entrepreneurship have positive effects on China’s economic growth. That is to say, economy grows faster in regions with more entrepreneurship. The results are still robust even when we control for different sets of demographic and institutional variables. Entrepreneurs (and entrepreneurship) have played a critical role in China’s economic growth over the past forty years.

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