



Inside the virtuous circle between productivity, profitability, investment and corporate growth: An anatomy of Chinese industrialization



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ABSTRACT

This work explores the dynamics of the 'virtuous circle' driving the impressive Chinese catching-up and growth by investigating the *micro* relationships linking productivity, profitability, investment and growth, based on China's manufacturing firm-level dataset over the period 1998–2007. Interestingly and somewhat puzzlingly, we find that productivity variations, rather than relative levels, are the prevalent productivity-related determinant of firm growth. Moreover, the direct relation between profitability and firm growth is much weaker and its contribution to the explanation of the different rates of firm growth is almost negligible. The only visible profitability-growth relationship is mediated via investment. Firm's contemporaneous and lagged profitabilities display positive and significant effect on the probability to report an investment spike, and, in turn, investment activities are related to higher firm growth.

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1. Introduction

The last three decades witnessed an impressive growth of the Chinese economy. Indeed, China undertook a deep and fast *great transformation* – borrowing Karl Polanyi (Polanyi, 1944) expression – leading from a traditional mostly rural economy to an economy driven by industrial activities. China's real per capita GDP has grown from only one-fortieth of the U.S. level and one-tenth the Brazilian level in 1978 to almost one-fifth the U.S. level and at the same level as Brazil by 2012 (Zhu, 2012). What has driven such a striking performance?

Grounded on a *growth accounting* decomposition framework, Zhu (2012) concludes that China's rapid growth over the last three

decades has been mainly driven by total factor productivity (TFP) growth rather than by capital investment.¹ However, in our view, decomposition effects are likely to only scratch the surface of a phenomenon characterized by widespread complementarities, processes of circular causation and cumulative dynamics (Myrdal, 1957):

All [...] frustrating effects of poverty, operating through other media than those analyzed by traditional economic theory, are interlocked in circular causation, the one with the others and all with the biases I referred to in the working of migration, capital movements and trade. The opposite effects of rising economic levels in the centres of expansion are in a similar fashion also inter-connected in a circular causation, continuously sustaining

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¹ In such estimates, the growth contributions made by human capital accumulation and increase in labour participation, the other two sources of growth in growth accounting decomposition, are positive but modest (Zhu, 2012).

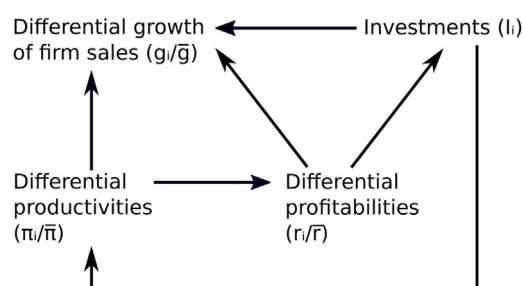


Fig. 1. The virtuous circle.

further expansion in a cumulative fashion. [...] if the expansionary momentum is strong enough to overcome the backwash effects from the older centres, new centres of self-sustained economic expansion [develop] (Myrdal, 1957, pp. 30–31).

In a circular causation framework increasing returns are widespread (Myrdal, 1957; Kaldor, 1972; Cimoli et al., 2009). In fact, the patterns of accumulation of knowledge and capabilities, at the levels of individuals, organizations and countries are at the core of increasing returns. The ‘unbound Prometheus’ systematically accumulating and improving technological and organizational knowledge is a crucial *deus ex machina* of the early industrialization of almost three centuries ago, and as well as of subsequent episodes of development (Landes, 1969; Freeman and Soete, 1997). The rapid economic catch-up and industrialization in China is no exception, in that it entails more of learning and “creative restructuring” of domestic firms rather than sheer “creative destruction” and even less so a multinational corporation-led drive (Yu et al., 2015). The rapid catching-up since 1978 is characterized by mobilizing the capabilities in part accumulated in the pre-liberalized stage and the high rates of investment after launching the economic reform which incorporates both the employment of modern machineries, organizational restructuring and learning. Chinese industrialization has certainly involved catching-up of all sectors by means of big and coordinated investment and capital accumulation, in the spirit of what suggested by the founding fathers of development economics (Nurkse, 1953; Gerschenkron, 1962; Rosenstein-Rodan, 1943, 1961; Hirschman, 1958; Prebisch, 1949). However, more importantly, the catching-up has been associated with *learning effects* well beyond the sheer accumulation of capital, involving the improvement of technological and organizational capabilities and the more efficient use of both capital and labour (Cimoli et al., 2009; Lee, 2013). This is not at all unique to China: see Lee (2013) for the interpretation of catching-up in Korea – basically a story of capability accumulation at the firm-level, involving also a considerable degree of State activism.

In this work, we explore the *microeconomic* evidence on China’s industrialization, the “virtuous circle” linking *highly heterogeneous* firm-level productivities, profitabilities, investments and corporate growth, both driven by and leading to firm-level technological and organizational learning and capability accumulation. Such virtuous circle is sketched in Fig. 1.

Note that the accumulation of production knowledge and process innovation underlying the impressive Chinese catching-up in productivity is only one, albeit crucial element of the whole virtuous circle driving the *great transformation*. Another major one is the influence exerted by the huge productivity differentials across firms upon corporate growth (and mortality) – i.e., the selection effect. In particular here, we focus on the effects of productivities, both in levels and growth rates, upon the patterns of firm growth in Chinese manufacturing over the 1998–2007 period. Moreover, we consider the possibility that effect of productivity upon firm growth is not exerted directly, but is mediated via profitability and

investment in tangible assets. Together, we also investigate the role played by different governance and ownership structures.

We find that relative productivity *growth* rather than relative *levels* are the prevalent productivity-related determinants of firm growth. Conversely, the direct relation between profitability and firm growth is much weaker and its contribution to the explanation of the different rates of firm growth is almost negligible. Rather, the only detectable profitability-growth relationship appears to be mediated via investment. Contemporaneous and lagged profitabilities display positive and significant effect on the probability of displaying a large investment episode. We also find that such effect varies significantly across firm’s ownership types: Chinese domestic private-owned enterprises (POEs) appear to be more financially constrained than State-owned enterprises (SOEs). In turn, firms’ investment activities are related to better performances, and such effect is more significant for State-owned enterprises than other types of firms.

In Section 2, we offer a telegraphic outline of our theoretical and empirical points of departures. Section 3 describes data and variables. Section 4 discusses the relationship between relative productivities and corporate growth. Section 5 considers the influence of profitabilities upon investments and Section 6 shows the impact of the latter on firm growth. Section 7 concludes.

2. Theoretical and empirical roots

2.1. Vicious and virtuous circles

Myrdal (1957) suggests that the principle of interlocking, circular inter-dependence within a process of cumulative causation – nowadays we would say *dynamic increasing returns* – should be the paradigm when studying the development process. The circular causation process can work either in a “vicious” or a “virtuous” fashion, which can be influenced by the exogenous changes out of the local system. Myrdal (1957) gives a simple example of the “virtuous circle” (often discussing “vicious circles”), addressing its spatially local dimension:

The cumulative process, [...], also works if the initial change is for the better. The decision to locate an industry in a particular community, for instance, gives a spur to its general development. Opportunities of employment and higher incomes are provided for those unemployed before or employed in a less remunerative way. Local business can flourish as the demand for their products and services increases. Labour, capital and enterprise are attracted from outside to exploit the expanding opportunities. The establishment of a new business or the enlargement of an old one widens the market for others, as does generally the increase of incomes and demand, [...] and the expansion process creates external economies favourable for sustaining its continuation. (Myrdal, 1957, pp. 25)

Note that in such a circular causation framework, there are conflicting forces driving either toward divergence or convergence among regions or countries. *Market forces* normally tend to increase, rather than to decrease, the inequalities among regions/countries. Conversely, the “expansionary momentum”, the development remedies – coordinated investments on a large scale of complementary industries – as the founding figures of development economics suggested involve “[an] industrialization processes [which begin] only if the industrialization movement can proceed along a broad front, starting simultaneously along many lines of economic activities. This is partly the existence of complementarity of indivisibilities in economic processes. [...] Fruits of industrial progress in certain lines are received as external economies by

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