



Industrial structure and economic fluctuation—Evidence from China[☆]

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ABSTRACT

Industrial structure evolves with economic development. Since the reform and opening up of the economy in 1978, China has undergone rapid economic growth and dramatic industrial restructuring, with the proportion of the primary, secondary and tertiary industry changed respectively from 28%, 48% and 24% of GDP in 1978 to 11%, 49% and 40% in 2008. Using panel data from 31 provinces in the past three decades, this paper empirically examined the relationship between economic growth and industrial structure. Based on results from unit root test, cointegration test, and Granger causality test, this paper concluded that the two variables are order-1 integrated, short-run economic fluctuation causes industrial structure disproportion, while a long-run bidirectional causal relationship exists between industry structure disproportion and economic aggregate fluctuation. This paper also investigated the determinants of China's industrial structure and found that influential factors include per capita GDP, domestic consumption propensity, urban–rural disparity, scale of the labor force and capital stock, property right protection, and administrative effectiveness.

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1. Introduction

Industrial structure evolves with economic development. Since the new China was founded in 1949, China's industrial structure has gone through dramatic changes, which can be divided into two phases. The first phase is from the early years of the new China to 1978, when the primary, secondary and tertiary industry took 28%, 48% and 24% of GDP respectively in 1978, compared with 51%, 21% and 28% in 1952 (NBSC, 2010b). This period was featured with the significant expansion of the secondary industry in China, while the primary sector declined in its percentage

and the tertiary industry was stagnant. The second phase of China's industrial adjustment is from the early years of the economic reform and opening up in the late 1970s till now, when the proportion of the primary, secondary and tertiary industry has changed respectively from 28%, 48% and 24% of GDP to 11%, 49% and 40% in 2008 (NBSC, 2010b). This period experienced a rapid growth of the tertiary industry and a stable development of the second industry. The primary industry continues to decline to 11%. These changes indicate that the GDP share of each industry fluctuated over time and China's industrial structure is being moved toward to a more service-oriented economy.

Interestingly, China's economic aggregate as measured by GDP has also undergone two similar phases. From the beginning of the new China till the early years of reform and opening up, China's GDP growth rate fluctuated sharply, with a range of over 20% around zero. In the second phase, from the early years of reform and opening up till now, the economic aggregate has grown at the rate of about 10%

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with a range of less than 6%, much more stable than that in the first phase. These observations suggest that, in the long term, the change in industrial structure is closely related to economic growth, while in the short term, the relationship between the two is more difficult to define.

A number of scholars have examined the relationship between industrial structure and economic growth in China. For example, Liu and An (2002) used the Moore structural variation index and proved that the rapid change of industrial structure is a major supporting factor of fast economic growth. Li (2008) found that the primary and secondary industries contributed most to macroeconomic fluctuations while the tertiary sector had no causal relationship with macroeconomic fluctuations. She further concluded that macroeconomic fluctuation is not the fundamental cause of industrial structure changes. Many previous studies have also examined factors that affect industrial structure. Some focused on the supply-side factors such as technology innovations and FDI (Chen and Wu, 2003; Pei, 2006). Some emphasized the demand-side factors such as consumption structure (Li and Long, 2001; Lin, 1993; Ma, 2003; Wang, 1999; Wu, 2004). Others discussed institutional innovations and their effects on industrial structure (Tao and Yang, 2004). We observed that almost all previous studies did research from one perspective and thus were unable to integrate all factors.

This paper has two main purposes. First, it examines the relationship between industrial structure and economic growth, using panel data and rigorous tests including unit root test, cointegration test, and Granger causality test. Industrial structure is measured by a disequilibrium index and economic growth is the GDP growth rate. Data used in this research are the panel data for all Chinese central municipalities and provinces from 1978 to 2008. Second, the paper comprehensively investigates the factors that affect China's industrial structure. We argue that demand, supply and institutional factors could all influence industrial structure. This paper attempts to provide important implications to China's further economic development.

Empirical evidence from panel data unit root test, cointegration test, and Granger causality test suggest that economic growth and industrial structure are order-1 integrated, that economic fluctuation is a cause of industrial structure disproportion in the short-run, and that in the long-run a bidirectional causal relationship exists between industry structure disproportion and economic aggregate fluctuation. This paper found that China's industrial structure is affected by per capita GDP, domestic consumption propensity, urban–rural disparity, scale of the labor force and capital stock, property right protection, and administrative effectiveness.

The organization of the paper is as follows. The next section briefly reviews the literature on the relationship between industrial structure and economic growth and the factors that affect industrial structure. Section 3 empirically determines the relationship between industrial structure and economic growth. Section 4 examines the factors that affect the disproportion of China's industrial structure. The last section gives conclusions.

2. Literature review

The relationship between industrial restructuring and economic growth has long been the focal point of debate on industrial structure theory. Most of scholars argued that industrial structure and economic growth are closely linked (Chenery, 1975; Kuznets, 1971; Pasinetti, 1981; Rostow, 1960). On one hand, different industrial structures lead to differentiated overall economic efficiency, which promotes the economy to grow at a differentiated rate. On the other hand, different economic growth rates put different requirements on industrial structure, thus pushing industrial structure to evolve to a higher level. The term “economics of structural change,” however, was almost unknown until recently (Silva & Teixeira, 2008).

The traditional literature on this subject can be divided into two. Proceeding from the hypothesis of competitive equilibrium and marginal analysis, the neo-classical theory attributed economic growth to three factors: capital accumulation, labor growth and technological advancement, without considering structural effect. Scholars like Fisher (1939) and Clark (1940) stated that labor force transferred from the primary industry to the secondary, and then to the tertiary as the economy grew. They argued that changes in industrial structure are insignificant by-product in the process of economic growth. The other group, emerged in the 1950s when economists began to pay attention to industrial structure, argued that economic growth is the result of industrial restructuring. The specialization and social division of labor has formed certain industrial structure, which in turn, determines the mode of economic growth. For example, Rostow (1960) claimed that the aggregate growth was paramount in the dynamic relations between economic aggregate and industrial structure and that changes in industrial structure affected the economic growth right from the early development stage to economic take-off and large-scale consumption stage. Chenery (1975) introduced structural variables into the classical growth model and proved that these variables did play a significant role in economic growth. Pasinetti (1981) studied three economic growth modes and concluded that the most common mode was the one resulted from changes in industrial structure. He argued that, as long as structural change can fit in with the changing demand and utilize technology with more efficiency, labor and capital would transfer from the low productivity sector to high productivity sector and thus promote economic development.

More recent research focused on model construction to study the relationship between industrial structure and economic growth (Chenery, 1986; Grossman & Helpman, 1991; Harberger, 1998; Syrquin, 1995). Particularly, Lucas (1993) and Verspagen (1993) built industrial development models from supply and demand aspects and emphasized the significance of structural change in promoting productivity. Yet, empirical findings are not conclusive. While many studies proved that structural changes play a prominent and positive role in economic growth (Ali, 2005; Berthelemy, 2001; Calderon, Chong, & Leon, 2007; Nelson & Pack, 1999; Young, 1995), some suggested that structural changes are not significant or even have no effect at

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