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Does the natural selection mechanism still work in severe recessions? Examination of the Japanese economy in the 1990s[☆]

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Abstract

This paper investigates whether the natural selection mechanism (NSM) of economic Darwinism works in severe recessions. Based on micro data, we constructed a comprehensive firm-level panel dataset for Japan from 1994 to 1998 to analyze a firm's entry, survival, and exit and its relationship with TFP. Empirical results show that efficient firms in terms of TFP exited while inefficient ones survived in the banking-crisis period of 1996–1997. Further, this phenomenon is observed mainly for new entrants and contributes substantially to a fall in macro TFP after 1996. These facts strongly suggest a malfunctioning of NSM in severe recessions.

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1. Introduction

Economic Darwinism explains the survival of the fittest firms in relation to changes in the business environment. According to the *laissez-faire* principle, the competitive market guarantees that the natural selection mechanism (NSM) of Darwinism leads to efficient resource allocation because firms with low profitability are forced to quit while productive ones survive in the market. As Galor and Moav (2002) explain, the struggle to survive can even produce revolutions that break blockades and open the way to long term economic growth.

The microeconomic foundation of NSM has been established by the development of sophisticated firm models since Jovanovic (1982). The standard model depicts a firm's decision for entry, surviving, and exiting as a result of maximization of the expected discounted future net cash flows. Olley and Pakes (1996) demonstrated that firms' private decisions in the U.S. telecommunications industry eventually contributed to productivity progress for the industry as a whole.

There are several empirical examples of a firm's entry/exit that have suggested the fulfillment of NSM both in developing and advanced economies. It is, however, still not certain whether NSM really works well in severe recessions because we have rarely experienced a serious economic downturn such as the Great Depression, where the market mechanisms might fail to function.

To answer the question of whether NSM really works well in a severe recession, the Japanese economy in the 1990s appears to be a prime candidate for analysis. The plight of the recent Japanese economy has stirred heated discussion on its causes and remedies. As recession persisted despite massive fiscal and monetary stimulation, economists turned their attention toward the supply side of the Japanese economy, especially focusing on a large decline in total factor productivity (TFP).¹ Since malfunction of the NSM on a firm's entry, surviving, and exit could explain the decline in macro level TFP, it is useful to investigate how NSM has functioned in this severe recession period of the Japanese economy.²

A dataset at the firm level for a panel of companies is essential to carry out this investigation. Most countries unfortunately conduct comprehensive surveys only of establishments

¹ Carefully purging out other factors, Fukao et al. (2002) found that the rate of Japan's macro TFP growth in the 1990s was only 40% of that in the 1980s. Nakajima et al. (2002), based on a dual approach of TFP, revealed that the productivity slowdown had already started before the burst of the bubble economy. Nishimura and Shirai (2003) observed serious retardation in technical progress of the Japanese service (includes wholesale & retail trade, transport, and telecommunications) sectors in the 1990s. Hayashi and Prescott (2002) utilized a dynamic macro model to show that the simulated business cycle caused by productivity slowdown follows the actual GDP fluctuations in Japan.

² Several empirical studies go further than estimating macro- or industry-level TFP and investigate the effects of sectoral and regional adjustment on TFP growth. Kuroda and Nomura (1999) and Fukao et al. (2002) calculated a resource reallocation effect among industries on macro TFP and showed its large slowdown in the 1990s. Higuchi et al. (2003) pointed out that the rigidity of industrial structure in the prefectures prevented macro TFP progress in Japan. Bae (2002) decomposed the macro TFP growth of Japan from 1960 to 1999 into a technical progress factor and an efficiency improvement factor and derived a result showing that the latter factor has rarely been found. The results of these studies suggest a difficulty in the adjustment process in Japan.

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