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# A quantitative study on endogenous formation of comparative advantage in South Korea

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## ABSTRACT

This paper incorporates search friction and human capital accumulation into an international trade framework to analyze the endogenous formation of comparative advantage induced by long-term employment relationship. The calibrated model demonstrates that the long-term employment relationship, by facilitating both human and physical capital formation, has contributed to South Korea's rapid 'export-oriented industrialization.' The counterfactual experiment reports that aggregate output in 2013 would have been reduced by one quarter, if South Korea had stayed as an autarky economy. Further counterfactual experiments find that had a typical worker's job duration been about two years from 1960s to 2010s, output in 2013 would have been reduced by more than 42 percent. Also, South Korea might have exported primary products, not secondary products with even shorter job duration or less efficient learning-by-doing.

## 1. Introduction

During the second half of the twentieth century, so called newly industrializing economies (NIEs) in East Asia (e.g. Hong Kong, Singapore, South Korea, and Taiwan) have experienced rapid export-oriented industrialization. The rapid export-oriented industrialization of those countries seemingly contradicts the Heckscher-Ohlin theorem that a country will export (import) goods that use its abundant (scarce) factors intensively. In fact, International Bank for Reconstruction and Development (IBRD) argued in its internal report in 1969 that South Korea would be unlikely to have a comparative advantage in large-scale modern industries, for example steel, which turns out to be a major industry of South Korea nowadays.<sup>1</sup> Regarding their rapid export-oriented industrialization, the central question among trade and development economists is what enabled those NIEs (and only those NIEs) to form Ricardian comparative advantage in the secondary sector so rapidly in spite of the initial lack of relevant physical and human capital endowment. The current paper quantifies the contribution of the NIE's distinct labor market feature, long-term employment relationship, to the endogenous formation of Ricardian comparative advantage with an emphasis on the South Korean episode.

Panels (a) and (b) show the relationship between export goods and job separation rate for the 23 OECD countries including South Korea. The slope coefficients in both simple regression analysis are significantly different from zero at the 5 percent level. Net export is denominated by each countries' GDP. Notice that we use different scales in the vertical axes for expositional purpose. Data on trade volume and GDP are based on World Development Indicators established by the World Bank (agricultural trade includes foods trade as well as agricultural commodities). Estimated job separation rates are from [Hobijn and Sahin \(2009\)](#) except for Japan and South Korea,

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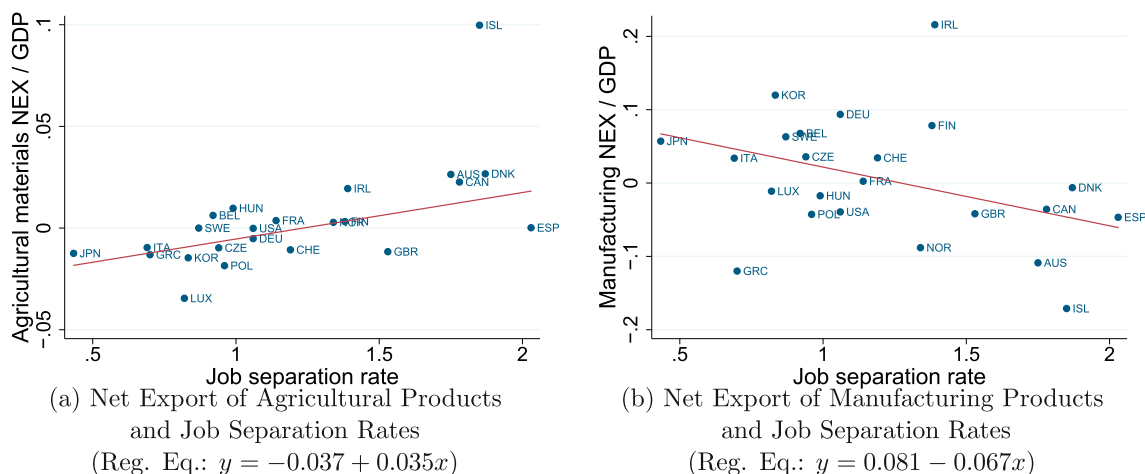


Fig. 1. Comparative advantage and labor market institutions.

those being from [Esteban-Pretel and Fujimoto \(2012\)](#) and [Chang, Nam, and Rhee \(2004\)](#). Panels (a) and (b) of [Fig. 1](#) show the ratio of net agricultural (manufactured) export to gross domestic product to tend to rise (fall) with the job separation rate across 23 OECD countries. This cross country correlation allows us to infer significant underlying linkages between the trade pattern of a country and the average job duration in its labor market.<sup>2</sup>

In addition, [Table 1](#) illustrates the change of South Korea's trade patterns in the period of 'export-oriented industrialization,' during which the average job duration was stable without any significant changes. Products of South Korea's primary sectors (agricultural sectors, interchangeably) accounted for more than 85 percent of exports in the 1960s, but less than six percent in the 1990s, products of the secondary sectors (manufacturing sectors, interchangeably) for less than 15 percent of exports in the 1960s, but approximately 95 percent in the 1990s. Given South Korean exports' total value of 0.022 billion dollars in 1960, 5 billion dollars in 1975, and 96 billion dollars in 1994, the country's secondary sector clearly experienced dramatic growth during this period.<sup>3</sup> However, the average job duration of South Korea remained consistently long despite the dramatic changes in trade patterns. In South Korea (and the other NIEs as well), strong binding to work place based on traditional ethics<sup>4</sup> that attach great importance to social solidarity resulted in an emphasis on duty to organizations over individualism.<sup>5</sup> Employees and employers share the social norm of a lifetime employment. That searching for other employment opportunities and replacing existing employees with new employees are regarded in these countries as dismantling social solidarity makes the employment relationship highly stable relative to that in other Asian developing countries.<sup>6</sup>

Motivated by the unique socio-economic background of those NIEs including South Korea as in [Fig. 1](#) and [Table 1](#), we incorporate labor market friction and human capital accumulation into a dynamic general equilibrium model and quantify the contribution of long-term employment relationship to South Korea's formation of Ricardian comparative advantage. [Davidson, Martin, and Matusz \(1999\)](#) predict countries with more efficient job search technology to enjoy comparative advantage in sectors with a high job separation rate. Our model posits that workers can accumulate human capital through learning-by-doing at different rates across sectors, which enables a country with a stable long-term employment to eventually specialize, regardless of the allocation of initial endowments, in the sectors in which learning-by-doing occurs fastest. This is consistent with the advantage of the lifetime employment allowing newly developing countries to accumulate human capital. [Redding \(1999\)](#) argues that developing countries, entering sectors in which they currently lack a comparative advantage, may acquire a comparative advantage in the future as a result of human capital accumulation through learning-by-doing. Extending their arguments, this paper undertakes a quantitative analysis on how and to what extent long-term employment relationship affects the pattern of international trade. Especially, it sheds light on a reverse channel missing in [Helpman and Itskhoki \(2010\)](#), [Helpman, Itskhoki, and Redding \(2010\)](#), and [Felbermayr, Prat, and Schmerer \(2011\)](#), whose main concern is how

<sup>2</sup> It can be interpreted as "the job separation rate (or equivalently the job duration) of an economy may affect and/or be affected by its trade patterns." The causality may run in both directions in interpretations of the simple correlations in [Fig. 1](#). However, the reverse causal interpretation that the job duration is affected by trade pattern is less plausible at least in South Korea's and NIE's experience, as the average job duration has not changed significantly over time.

<sup>3</sup> Another clear evidence is the shift of the agglomerate Korean business groups' (jaebol) main businesses. Samsung, which was established as a grocery store in 1938, exported squid and sugar in the 1950s, and added textiles in 1956, fertilizer in 1964, electronics in 1969, heavy machinery in 1974, and semi-conductors in 1978. The latter three products, with which Samsung had no business experience in the 1960s, and which required enormous physical capital investment, are presently the company's major exports. Hyundai similarly began, in 1946, as a construction company and, although it didn't accumulate enough technology and capital to produce the products until the 1970s, currently retains significant market share in the automobile and ship markets.

<sup>4</sup> It seemingly stems from Confucianism tradition among South Korea and those NIEs.

<sup>5</sup> Many studies recognize the importance of culture in the process of economic development. One of the most well-known arguments about the relationship between a cultural factor and long-term economic development is the claim by [Weber \(1930\)](#) that Protestantism, in contrast to Catholicism, sanctions the virtues of hard work and accumulation of wealth, and that these values provide the moral foundations of capitalism in a modern market-based economy.

<sup>6</sup> For example, [Tanaka \(2016a, b\)](#) recognizes the problem of short job durations in Myanmar that a significant portion of employed workers voluntarily quit their jobs even without notice after payday and/or holiday seasons.

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