

Development through Integration

Authors: Sang Yoon (Tim) Lee and Yongseok Shin

What would happen if a poor country were to be integrated with a richer neighbor? Our analysis of the reunification of South and North Korea shows convergence of income between countries but divergence within. The evolution of inequality depends crucially on migration policies, as well as worker skills and production technology.

Introduction

It is impossible to envision economic development without integration into the world economy. The flows of goods, services, capital, skills and technology into and out of countries are essential for growth. However, such flows are subject to restrictions, some more than others. For example, goods are traded much more freely than labor can cross borders. What would happen if a poor country were integrated with a rich neighbor in the fullest sense? How fast would it grow? Who would gain or lose from the integration? For a poor country, such an integration may be the fastest possible way to prosperity, but this remains an elusive strategy as long as enough rich-country residents oppose trade liberalization and immigration, let alone a full-scale integration.

We analyze a hypothetical reunification of South and North Korea, one a major industrial economy and the other a poverty-stricken, isolated economy. We compute the evolution of macroeconomic variables and inequality over time under various policy scenarios, ranging from strict migration restrictions to full integration. All these scenarios can play out in reality depending on the political situation.

The inter-Korea relationship has gone through ups and downs in recent years. The crisis of 2016 was followed by a sudden thawing in 2018, with renewed talks of improved economic cooperation. However, due to the stalemate over North Korea's nuclear programs, the relation has subsequently soured, dimming the prospect for economic integration.

Empirical Results

One essential piece of knowledge for this project is the distribution of North Korean workers' skills and some evidence on how North Koreans adjust to a modern, market-based economy. The challenge is that North Korea does not publish any economic statistics. We partially overcame this challenge by procuring two datasets that have not been used previously. One is data on approximately 30,000 North Korean refugees settled in South Korea, complemented by an in-depth survey of 1,000 of them that we commissioned. The other is from the

now-closed Kaesong Industrial Complex, in which South Korean managers employed more than 50,000 North Korean workers at its peak.

We draw two conclusions from our analysis of these two datasets. First, the median worker of the North Korean skill distribution is at best as skilled as South Korean workers in the tenth percentile of the South Korean skill distribution. Second, wages of even young adult refugees do not catch up with native workers' as they gain experience in South Korea, but there is evidence that those who arrived at a young age experience faster wage growth especially if they went to college in South Korea. This suggests that the skill gap between North and South Korean workers will be closed by successive cohorts of young North Koreans entering the labor market, rather than by older cohorts accumulating skills later in life. Historical data from Germany also paints a broadly consistent picture, although the initial skill gap between East and West Germans was considerably smaller than the gap we infer from the Korean data.

Quantitative Analysis

Using these empirical results as input, we simulate the integration of the model economies. North and South Korea are modeled as two economies identical except for population size (North Korea's is approximately half of South Korea's) and skill distribution (North Korea's is stochastically dominated by South Korea's). In each economy, workers select into different occupations based on their skill level. There is a spectrum of differentiated goods that are imperfectly substitutable in the production of a final good, and all occupations are essential for producing each of the differentiated goods.

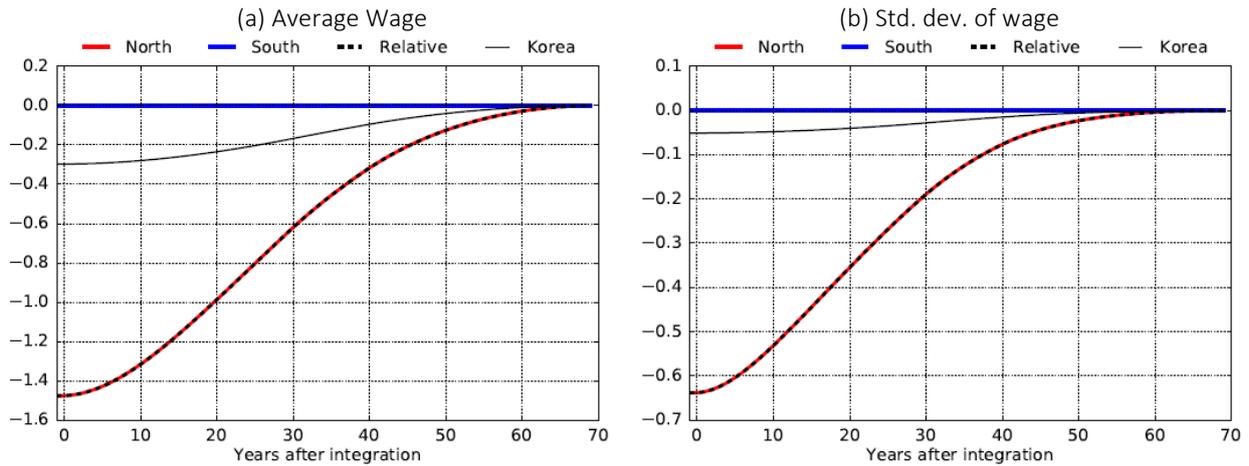
Here we write about two possible reunification scenarios. In both, we assume that the skill distribution of successive cohorts of young North Koreans gradually catches up with the South Korean skill distribution. However, older North Korean workers already in the labor market do not acquire more skills.

In the first scenario, the two economies remain separate and only trade the final good. The biggest change is the skill accumulation of the successive cohorts of North Koreans and the undistorted allocation of skills within North Korea. (The real-world income gap between North and South, a factor of 30, reflects both the skill distribution difference between the two and the severe distortions in North Korea's non-market economy.)

In each country, many workers will want to move but are not allowed to do so. Nearly all North Koreans, except for the most skilled, want to migrate south for higher wages. Perhaps more notable is that some high-skill South Koreans want to work in the north, where skill is scarcer and thus commands a higher wage.

Figure 1 shows the evolution of the average wage and the standard deviation of wage in the two countries in the first scenario, both as log deviations from the pre-integration South Korean values. There is no change for South Korea because we assume its skill distribution does not change over time. The convergence of North Korea reflects the fact that the skill distribution of younger cohorts is closer to South Korea's, which has both a larger mean and more dispersion. (Initially, all North Koreans are poor, and there is little within-country inequality.) The convergence takes a long time because the skill accumulation occurs across cohorts, not in a given cohort's lifetime.

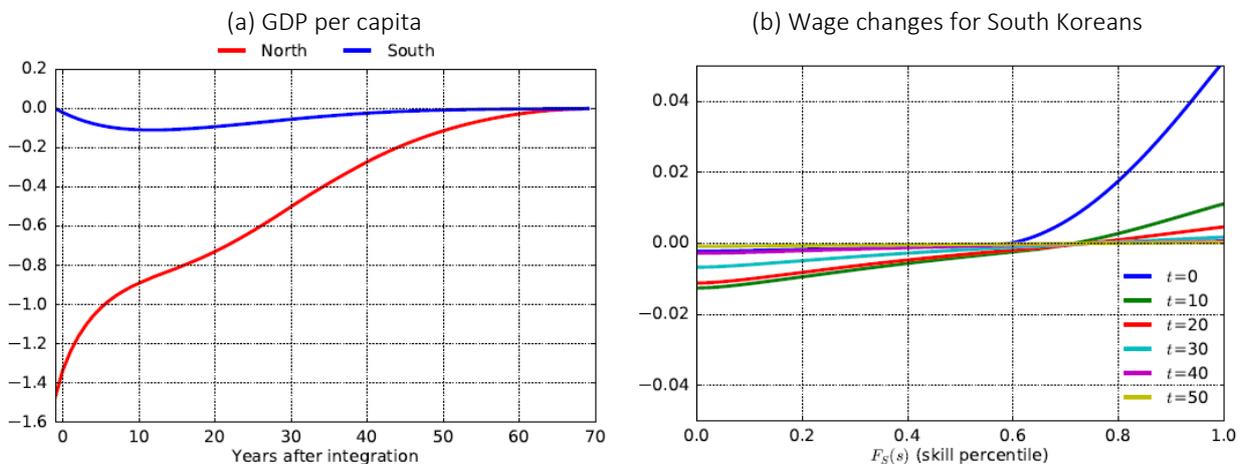
Figure 1: Final good trade only, no migration



In the second scenario, we allow for migration quotas: An increasing fraction of North and South Koreans are given permits to work in either country. Low-skill North Koreans migrate South and work in low-skill occupations, and the most skilled South Koreans venture north, working in high-skill occupations, exploiting the differences in skill prices (i.e., wage schedules) between the skill-scarce north and the skill-abundant south. Such migrations compress the income gap between North and South Koreans but increase the inequality among South Koreans.

Figure 2a plots the evolution of GDP per capita in South and North Korea with migration. South Korean GDP per capita falls initially because of the arrival of low-skill North Koreans. (The income of migrants is counted in the destination country GDP.) Over time, the skill distribution of North Koreans converges to South Koreans', and fewer of them migrate south. North Korean GDP per capita grows fast earlier on, compared to the no-migration case in Figure 1a. This is because a fraction of the lowest-skill North Koreans migrates south and at the same time some of the most skilled South Koreans go work in the north. We see that migration expedites the convergence of the average income of the two countries.

Figure 2: Migration quotas



The influx of low-skill workers from the north brings down the wage of low-skill South Koreans, although they move up to slightly higher-skill occupations. The South Koreans who migrate to the north earn higher wages than in the south, working in occupations that demand even more skill. Figure 2b shows the log deviation in wages from the pre-integration level for South Koreans of a given skill level on the horizontal axis. Two comments are in order. First, the majority of South Koreans are worse off from the integration: About 60 percent at the time of integration, but more than 70 percent after a decade. Second, both the positive and the negative effects are long-lasting. The gains of the most skilled South Koreans diminish over time because the improving skill distribution of North Koreans makes skill less scarce. The loss of the less skilled South Koreans initially rises over time as more North Koreans migrate south, and then becomes eventually smaller as the number of low-skill migrants falls, due to the improved skill distribution in the north.

These results reliably appear in other policy scenarios, as we vary the degrees of restrictions on goods flows and labor mobility between the two countries.

This is the first ever micro-founded, quantitatively oriented framework to analyze the Korean reunification. The new datasets on the North Korean refugees and the Kaesong Industrial Complex themselves are of interest to policymakers, as well as the inequality dimension of the integration exercises. The analysis can help policymakers evaluate and choose from policy options in preparation for the prospective economic integration of the two Koreas.

Moving Forward

The framework we develop is not specific to Korea. One can use it to study the role of economic integration of varying kinds and degrees in economic development. Our model is micro-founded, which means it can naturally be disciplined by micro-level data and speak to inequality. Its usefulness lies in its applicability to real and hypothetical questions of large scales that cannot be easily addressed with randomized controlled trials. We will continue exploring such questions in economic development, complementing more empirically oriented works in the field.

This note is based on research conducted as a part of PEDL [MRG 2356](#).