

Structural Change, Labor Market Dynamics and Economics Growth: Comparative Study of Ireland, Korea, and Malaysia

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November 2005

Introduction

Rapid global technological changes have resulted in an increase in the demand for workers with higher education. Not only is this trend identified in OECD countries, but also it is observed in most East Asian countries. In response to the intensification of competition caused by the emergence of China and India, many East Asian countries have to restructure their economies to produce more skilled- and capital-intensive goods. The shift in the industrial structure has greatly increased the demand for skilled labor and thus creating significant skills shortages and mismatches as the workforce tries to upgrade their skills level to meet the demand. The problem of skills shortages and mismatches is especially acute in Malaysia as indicated by the Investment Climate Survey Report by the World Bank (2005).

The objective of the paper is to study the problem of skills shortages and mismatches in the Malaysian economy. By making reference to policies adopted by the best-practice countries of Ireland and Korea, the paper suggests various institutional and policy levers that could address the skills shortage problem in Malaysia. Both Ireland and Korea are open economies that have successfully tackled the skills shortage problem faced by their economies and have adjusted their industrial structures to produce higher value-added activities.

Section 2 of the paper provides a simple conceptual framework for an open economy as it structurally shifts towards an innovation-based economy and the framework identifies potential sources of skills shortage that could occur in the domestic economy. Section 3 highlights the various sources of skills shortages in the Malaysian economy. Section 4 analyzes the labor market dynamics and productivity growth of Ireland, Korea, and Malaysia. The various policies that were implemented by Ireland and Korea to overcome the skills shortage problem are also discussed. Section 5 proposes some policies that Malaysia could implement to address its skills shortage and mismatch problem.

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2. Structural Changes and Importance of Skilled Workforce

As the miracle growth from technology adoption was exhausted and competition to attract foreign direct investments intensified in the Asian region due to the emergence of China and India, the more advanced developing countries in East and Southeast Asia are restructuring their economies towards more technology- and innovation-intensive production to sustain their global competitiveness. To maintain competitiveness in the export performance and also to attract foreign multinational corporations, these countries have to increase their overall human capital in terms of skilled workforce and boost their indigenous knowledge capital through R & D investments.

The key fundamentals of an innovation-based economy are driven by human capital and innovation system. The key components of the human capital are driven by the labor force education level, the age of the labour force, the level of technology specific-skills acquired by the workers and the adoption of globally competitive educational policy in the domestic economy. The innovation system of the economy is driven by the level of research and development, the adoption of policies that are conducive to national innovation, and also by the level of infrastructure investments in new technologies. The effects of human capital and innovation systems are not mutually exclusive. There are strong complementary effects between human capital development and innovation systems, which are determined by the absorptive capacity of the domestic economy in terms of its human capital (the skilled level of workers) and the level of innovation and technological developments in the economy. In addition, innovation systems are also determined by the institutional regulatory framework such as the educational institutions, financial support for private sector innovative activities such as venture capital markets, infrastructure investments such technology hubs, and intellectual property rights framework in terms of patents and copyrights.

Besides global forces, the sustainable growth in the economy is determined by the balanced growth in both human capital development and innovation system. The lack of human capital and indigenous technology will impede structural changes of the domestic industrial structure to higher value-added activities, and thus create an acute shortage of skills.

3. Structural Changes in Investment Climate in Malaysia

Malaysia's economy has been growing at an annual real rate of 6.6% for the past three decades. The strong economic performance, however, could be attributed mainly to physical capital accumulation and less to total factor productivity growth (TFPG). In fact, the contribution by TFP growth to per capita growth has been declining over the past 2 decades. Also, Malaysia lags behind Korea, Singapore and Thailand in terms of both labor productivity growth and TFP growth.

The Investment Climate Survey Report produced by the World Bank (2005) has highlighted three major concerns of firms operating in Malaysia and they are i) shortage

of skilled labor, ii) regulatory burdens and iii) macroeconomic uncertainty. The report also points out that the weak innovation capabilities of Malaysian firms are hindering the country's productivity growth.

The skills shortage problem is more specifically manifested as deficiencies in the areas of English language skills, ICT skills, and professional and technical skills. One of the causes of the problem could be traced to the Malaysia's tertiary education system. The enrolment and completion rates for higher education of the country are substantially lower when compared to countries with the level of income. This has resulted in an insufficient supply of tertiary graduates. The problem was aggravated by university students not choosing fields of study that were of relevance to the industries. Another cause of skills shortage problem was the low incidence of training among firms, notwithstanding the fact that Malaysia possesses a good skills development infrastructure. Last but not least, the strict regulations and controls on importing foreign skilled labor further exacerbate the country's skills shortage problem.

The Investment Climate Survey Report has also pointed out the lack of innovative readiness among Malaysian firms. The lack of innovative readiness stems from i) a lack commitment to technology-based development, ii) weak educational system, iii) weak policy to attract foreign investment, iv) lack of capability to produce technology-intensive products, v) lack of scientific and engineering manpower and vi) weak R&D relationship between industries and tertiary institutions.

4. Structural Changes and Economic Growth: Cases of Ireland, Korea and Malaysia

Beveridge Curve Analysis

The study undertook a Beveridge Curve analysis to study the skill mismatch problems in Malaysia. A Beveridge curve shows the relationship between unemployment rate and vacancy rate of a country. It can reveal essential information about the flexibility and the current state of the labor market due to cyclical and structural changes in the domestic economy.

The Beveridge Curve for Ireland shows that the country was experiencing some mismatch problems in the mid-1990s, where the unemployment rate was high. The subsequent movement along the Beveridge curve indicates that Ireland had successfully overcome the mismatch and skills shortages problem in its labour market.

The Beveridge Curve for Korea reveals that the country's labor market responded well to the structural changes in the domestic economy that occurred in the mid-1980s. Although the economy was temporarily disrupted by the Asian financial crisis, the Korean labor market was able to respond successfully to the structural changes in the economy.

The Beveridge Curve for Malaysia experienced some mismatch problems in the mid-1980s when the economy was adjusting structurally to produce goods and services that were more labor- and capital-intensive. The country also responded well to the changes in the demand for skilled labor in the 1990s. But since the early 2000s, the vacancy rate has been falling with unemployment rate showing some marginal increases. This indicates potential problem of structural unemployment and skills shortages in the domestic labor market.

Productivity Growth Comparison

Malaysia has experienced a secular decline in labor productivity growth since the mid-1990s. Although both Korea and Malaysia were affected by the Asian financial crisis, Korea's TFP growth bounced back in a more robust and expeditious ways than Malaysia. Similar observations can be made when economies around the world were set back by the bursting of the dot.com bubble in the US. Malaysia seems to be more vulnerable to negative external shocks.

The ability to move from a low technology economy to a high technology one is the inevitable path to sustained economic prosperity. Ireland and Korea have developed strong manufacturing industries. This is reflected in the two countries' manufacturing labor productivity growth, which have outperformed that of the US. Analyses of industry-level data show that high-tech sector commended the lowest labor productivity in both economies in the late 1970s, while the low-tech sector had the highest and the second highest labor productivity in Ireland and Korea respectively. But in 1995, labor productivity in the high-tech sector overtook the other three sectors. Similar observations can be made on the shares of value added of the four sectors.

The Irish and Korean experiences

The superior productivity performance illustrates that the two countries have got their basics right. Ensuring an efficient supply of skilled workers and personnel through the prudent and effective application of educational and training policies is the focus of this paper.

Korea's education policy has changed over time to meet the demand for skills and talent that the new economic structure demands. The country has gone through three distinct stages of economic development. Each stage calls for a different mix of education policies. At the initial stage of economic development, the country's comparative advantage was in labor-intensive production. The key education policy is to ensure a sufficient supply of workers with basic skills: the ability to read and write and understand and follow technical instructions. The country achieved this by expanding general education at the primary and lower secondary level and vocational education and training. In 1967, the Korean government enacted the Vocational Training Law to allow the setting up of more vocational training institutes. In order to improve the quality of skilled manpower, the government implemented the National Technical Qualification Testing system in 1973. The passing of the Basic Law for Vocational Training in 1976

required companies to provide in-plant training. Failing to do so would result in the paying of a levy.

At the second phase of economic development, the country embarked on a massive government-directed industrialization effort to steer the economy towards chemical and heavy industries. The focus of education policy at this stage is the expansion of upper secondary and tertiary education. Vocational training remains a top priority though. The government expanded the enrolment in higher education in the 1980s due to social pressure. This caused the enrolment in vocational secondary schools to decline. Similar trend was also observed for in-plant training. This resulted in a shortage of production workers especially in small- and medium-sized companies.

The current stage of economic development, which started in the mid-1990s, has seen the country establish a strong foothold in high-tech industries. The emphasis of education policy should be placed on strengthening the links between schools and industries, establishing infrastructure for life-long learning, having a competitive higher education system. To strengthen the links between schools and industries, especially in the areas of technical education and training, a system name “Two-Plus-One” program, which comprises two years of vocational education in schools, followed by one year of practical hands-on field training, was introduced in 1994.

In 1995, the Presidential Commission for Education Reform proposed the second Education Reform Program. Vocational education was reformed with the objective of encouraging lifelong vocational training. To achieve the goal, part-time registration to college was allowed on a test base system. Students in vocational senior secondary schools and workers in industry were able to continue their education. Furthermore, these students have priority in the selection process for entry in colleges in related fields of study.

The Korean government initiated the Brain Korea 21 project to turn the country’s universities into world class institutions of higher learning. The government invested \$1.2 billion in universities with three quarters of the budget being used to support graduate schools in certain fields in the natural and applied sciences, humanities and social sciences. Part of the budget was also used to provide a supportive educational environment for graduate students in the form of stipends, financial support for overseas study and research infrastructure.

Another lesson that can be drawn from the Korean case is that a systematic effort was made to link up the different components of the economic structure to the educational institutions. Over the years, higher education in Korea has evolved into a dual system: few elite organizations setting the benchmarks and operating outside the organizational boundaries of the established system and mass higher education. A good example would be the setting up of Pohang Institute of Science and Technology (POSTECH).

Being a small and open economy, Ireland is more vulnerable external shocks compared to Korea. Thus, the mix of policies that Ireland employed to overcome its skills shortage

problem also differs slightly from that of Korea. The ingredients of Ireland's economic success were identified as i) sound macroeconomic policy, ii) low corporate tax rate, iii) presence of efficient government institutions such as Industrial Development Agency, iv) investment in ICT technology, v) strategic location in the EU with a English-speaking population, vi) existence of an education system that is integrated with the global demand, vii) open immigration policy and viii) centralized wage bargaining system.

Like Korea, Ireland's education policy has been one of the key factors for its economic success. The country has the highest percentage of population with tertiary education. It has also one of highest number of science and engineering graduates per 1000 population. The provision of free secondary education in the late 1960s has definitely contributed to this spectacular achievement. Other reforms to the education system were the abolition of primary school certification and increases in the compulsory attendance age.

At tertiary level, Ireland has an education system that places equal emphasis on general education and vocational and technological training. To a certain extent, this mitigates the shortage of workers that have the necessary skills to meet the demand of high-tech FDI. The establishments of the Regional Technical Colleges and two National Institutes of Higher Education have also played a part in building up Ireland's pool of skilled labor.

In the 1990s, Ireland ran into skills shortage problem when there was a surge in FDI and export demand in the ICT sector. The number of science graduates produced was insufficient to meet the requirements of the high-tech economy. Policies to increase the supply of skilled workers were proposed. They are i) curriculum reform to establish the relevance of science and technology to contemporary life and society and ii) provision of hands-on laboratory experiments at the primary and secondary levels, iii) provision of in-service teacher training and iv) new physical sciences grant to enhance science education in all primary schools.

The immigration policy between Ireland and the UK allows workers from the two countries to move in and out freely. This equalizes wages in two countries. But more importantly, when Ireland is facing skills shortage problem, this drives the wages of skilled labor higher which in turns attract skilled labor from the UK. All these are not possible without a highly flexible immigration policy.

5. Policy Relevance to Malaysia

To help address the skills shortage problem in Malaysia, the following policies are proposed.

- A. The key factor for the growth of the innovation-based economy is in the development of human capital. Both Ireland and Korea have invested heavily in higher education and aligned their educational policy to the changing demand conditions in the economy. It must be recognised that the Malaysian economy is an open economy driven primarily by foreign direct investment and export growth. Thus the educational

system must recognise the changing demand conditions in terms of the needs of multinational corporations and large corporations. As the Malaysian economy transits towards innovation-based economy, the demand for scientific skills will increase. To meet the rising demand for science and technical skills, the following alignment in the education system to vocational- and technical based education will be important.

- i. Increase the supply of workforce with science and technical (S&T) background. The intake in S&T (science and technical) courses at the university level should be increased with relevant investment in key S&T technologies in the Universities.
- ii. The investment in laboratories and research centres at the University will provide the link between academic institutions and industries in transferring technologies and knowledge. This will also be an important conduit for aligning the educational system to changing needs of the industries. The case of POSTECH, Pohang Institute of Science and Technology in Korea is a good example. POSTECH was a spin-off of POSCO, a leading Korean steel company, and was created in response to acute shortage of high-quality graduates. The establishment of Bell Labs at Lucent Technologies' Dublin facilities, Digital Enterprise Research Institute was set up with the collaboration with University College Galway and Hewlett-Packard, and the collaborative partnership by three Irish Universities to set up the Centre for Research on Adaptive Nanostructures and Nanodevices are some key examples of industrial and Universities collaboration in Ireland.
- iii. This increased intake should also be complemented with strong academic staff in S&T. The retention of strong and well-qualified academic teachers and staff was one of the key components in improving the quality of its academic institutions in Ireland.
- iv. Training and re-tooling are important for workers to sustain their human capital in rapidly changing industrial structure. There are number of Industrial Training Centres and Polytechnics in Malaysia. The scope and depth of industrial training education in these institutions could be improved. The various industrial training centres could be consolidated and merge to form a larger training centres to cater for the various skill training of the older and younger workforce. For example, the initial objectives of RTCs in Ireland were to provide i) senior-cycle post-primary courses leading to the Leaving Certificate, ii) junior and senior Trade Certificate courses for apprentices on day or block release from work, iii) courses for technicians and iv) adult education and retraining courses. The larger training centres also have the economies of scale to shift its focus from the provision of secondary teaching to that of tertiary courses. The scope of courses was also expanded to include subjects such as engineering, construction and business studies, applied science and art and

design. The certification of the various training programmes at the national level is very vital for the recognition of the training certificates. A national agency should be set up to accredit the various training institutes and maintain the quality of skill training.

- v. The introduction of European Social Fund aid to the RTCs also played a part in building up Ireland's pool of skilled labor. Thus, a national wide fund to assist workers to upgrade their skills will be very crucial for life-long learning and workers to maintain their human capital in the long-run.
 - vi. The recognition of changing demand for skilled workers should also be in line with the need for English-speaking work force with high educational attainment to be employed in rapidly changing S&T production activities. For example, significant increase in information and telecommunication technologies requires workers with good communication and soft skills to support activities ranging from business services to sophisticated financial services. Thus there is an urgent need for the Malaysian education system to adopt English medium in their curriculum and a strong emphasis should be placed in the written and communication skills from basic to tertiary education system.
- B. There should be a central government planning agency to coordinate and integrate the educational system to changing needs of the private sector such as the Industrial Development Agency in Ireland. This agency should be driven by the global best practice in promoting Malaysia's investment in its industrial structure. This government agency should be a leading agency to monitor the needs of the industries, and continuously improve and align the education and infrastructure in the domestic economy.
- C. Immigration policy is another important component to create flexibility in the labour market and the skilled foreign workers could be used to augment domestic human capital. Ireland's immigration policy allows immigrants from UK, European Economic Area (EEA) and Switzerland to take up employment in Ireland without any requirements of work permits or working visas. Thus the Malaysian government could liberalize the flow of more skilled foreign workers into the domestic economy.
- D. Greater cooperative approach among workers, employers and government could play an important role in harmonizing the structural changes and skill shortages in the domestic economy. The harmonizing of the labour market could be in the form of moderating wage changes and greater recognition of skill shortages at the national level, which could be important to recognise the bureaucratic bottlenecks and push for important labour market reforms at national level.
- E. In addition, there should be greater investment in domestic "Absorptive Capacity" such as the infrastructure for information and telecommunication technology. The

provision of infrastructure is an important component of innovation system in terms of creating the externalities for amalgamation of key local and foreign industries.

- F. The role of private sector to finance risky ventures in R&D activities becomes equally important for productive returns from R&D investments. There should be more support from financial systems, in particular the venture capital, which is more capable to evaluate and monitor high-risk innovating firms in the domestic economy. This screening and monitoring increases the probability of well defined and more market based R&D activities to be undertaken in the economy, increasing the returns from R&D activities in the domestic economy.
- G. The small and medium size enterprises (SMEs) will play an important role and conduit in creating linkages to the multinational companies and hence create direct and indirect access to the technologies of the multinational corporation.