

SKILLS DEVELOPMENT STRATEGIES FOR RAPID GROWTH AND DEVELOPMENT: THE EAST ASIAN ECONOMIC MIRACLE

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Dr Marcus Powell (Director – CEI)

Mr John Lindsay (Policy Analyst – CEI)



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Introduction

Over the past three decades the world has witnessed significant growth. Some nations in particular have experienced very rapid growth over relative short periods of time. These nations are known as the ‘Tiger Economies’ and have been primarily located in Eastern Europe and East Asia including nations such as Singapore, South Korea, Slovakia, Taiwan, Ireland, Hong Kong SAR and Japan. Particularly strong has been the growth of the East Asian economies with the emergence of the ‘East Asian Economic Miracle’ featuring high performing Asian economies including Hong Kong SAR, Japan, Malaysia, South Korea, Taiwan, Indonesia, Vietnam and Thailand (though some such as Vietnam have only recently begun their rapid growth and others such as Indonesia have slowed considerably).

According to the World Bank the rapid growth of these nations is due to the fact they shared similar characteristics of “macroeconomic stability, sustained growth in productivity and significant investment in technology, and continued investments in human resource development”. While true, it was not these characteristics alone that led to the Tiger Economies high growth trajectories; other nations had similar macroeconomic characteristics but did not experience the same high rate of growth. In reality each country followed their very own distinct development path, dictated by specific national priorities and policies, pursuing their own vision of how to achieve a competitive advantage in a global economy. To better understand what led to the ‘East Asian Miracle’ it is necessary to look beneath the basic macroeconomic framework, and to understand those specific policies, institutional structures and practices that contributed to significant GDP growth and standard of living increases.

Markets if left alone are unable to closely coordinate the processes of education, human resource skills formation and economic sector development. This presents governments with a challenge as each of these factors requires the other if there is going to be sustainable national growth. Governments must find innovative and situation-specific ways to guide these factors and ensure that the demand from employers for skilled workers is met with an appropriate supply from the workforce. This matching is necessary in order to avoid critical shortages of skills that would slow down a country’s economic growth while at the same time encourage standard of living increases.

To achieve sustainable high growth patterns countries need to develop systems to advance national technological, economic and human development. The development progression for the Tiger Economies has been one of catching-up, moving up the value chain through growth from low to high technology sectors, raising productivity, improving competitiveness, increasing exports, with a particular focus on technological intensive manufacturing and services. The continual development and application of skills in this context is an important policy tool and a necessary ingredient for development. Skill and human resource development is not a simple task, however, nations that ignore it become trapped in a low skill trap where their initial advantage of a low-wage workforce is never built upon through a higher skilled workforce. Not only is it essential to raise current skill levels, it is vital to plan for those skills that are needed in the future, taking into account what skills will be needed by the more advanced sectors that will drive future growth.

Singapore, South Korea, Hong Kong SAR and Vietnam have all successfully entered into high-growth progressions using coordinated sector and skill development strategies. Using these nations as case-studies this paper provides an analytical insight into this complex process and how education and policies for skills development were successfully integrated into these nations’s overriding framework for economic development.

Singapore

Singapore is a small nation and lacks a natural resource base or large population which they could draw upon. Also due to its small size, Singapore is densely populated with high land and rent costs. Despite this, Singapore's citizens enjoy one of the highest standards of living in the world. In 1965 Singapore was ranked just 42nd in the world with a Gross Domestic Product (GDP) per capita of US\$512, as of 2009, Singapore is now ranked 8th in the world with a GDP per capita of US\$50,300. A remarkable achievement especially in light of the many unique challenges and constraints Singapore has faced, and continues to face. During this time Singapore has experienced exceptional growth across many economic indicators, especially employment. Policy makers in Singapore have demonstrated remarkable ability to guide the industrial sectors and skills that they have identified as being the most able to move the country up the value chain towards more knowledge and technology intensive sectors.

At the time of their independence Singapore faced a very difficult task, one that all developing countries face, they had to break into world markets when the only competitive advantage they had was a supply of unskilled labour. In order to move-up the global value chain, employers require workers with higher skill sets. It would not have been possible to attract inward investments from sectors that utilise higher capacity and technology into Singapore if they did not have people with skills to work in those industries. Insufficient or lack of appropriate skills within the workforce can slow national development. In order to overcome these challenges, the government of Singapore centralized control of three important areas: industrial policy, education, and skill development.

Singapore's action to centralize guidance of industrial/sectoral policy was deemed necessary to insure that industry grew towards higher-skilled, higher technology and higher value added sectors and did not just take advantage of Singapore's existing base of low-skilled and low paid labour. Education policy was guided to create a sense of national awareness, collective unity and increase the skills of citizens moving through the education system and into the workforce. Singapore also devised a skills formation mechanism so that the present and future skill needs of new, developing and growing industries would be reflected into the changing skill sets of the workforce. Singapore had to guide these three areas in a coordinated centralized manner, if the system had been left to market forces it would have taken generations for the skill shortage needs to filter down the education systems and to produce the necessary skills in the workforce.

Initially Singapore built on their existing competitive advantage, by focusing on their geographical advantage by promoting the trading sector and their preponderance of low-skilled labour by promoting the labour intensive manufacturing sectors. However, the government of Singapore did not want to get stuck within this labour intensive manufacturing sector, consequently they developed a clear industrial policy to push Singapore towards higher skilled sectors over time. The government saw Multinational Corporations as a means to bring to Singapore knowledge, capital, managerial experience and technology to assist with their industrial development and facilitate shaping of the training and education systems to up-skill workers. These foreign corporations were a much faster way to introduce new technology and skills that would have been difficult, if not impossible to do so domestically with Singapore's limited resources, technological base and existing skill levels.

Singapore initially focused on the electronics and textile industries that were looking for low-cost (low-wage) locations. As a result of the policies and incentives to attract them, foreign direct investment into Singapore rose from 239 million Singaporean dollars in 1966, to 6.4 billion Singaporean dollars in 1979. This attraction of Multinational Corporations allowed Singapore to very quickly develop through the '60s and '70s, but it did not naturally allow for further catching-up to more developed countries even though investment was encouraged in higher skilled sectors. To attract those corporations engaged in more technologically advanced

sectors Singapore still needed to further upgrade the skills of their workforce through investments in education and training. To address this the Ministry of Trade and Industry (MTI) was established as a type of 'Super Ministry' who would coordinate overall economic development that the other ministries are required support. This insures that the MTIs priorities are incorporated in to all Ministerial policies and are in fact the key driving policies.

Education and training was a big challenge for Singapore, they had to provide workers with ever increasing skills to match anticipated employer needs. The Multinational Corporations already operating in Singapore could not be relied upon to drive the skill agenda as they would be narrowly focused on what their present needs were, while Singapore wanted to fulfil those but also move up the value chain. To do so Singapore had to focus skill development specifically on those skills deemed necessary for the specifically targeted growth industrial sectors tied to future industrial development. Singapore was further restrained by its relatively small population base, consequently virtually all workers had to be mobilized and brought in to the system to meet demand. By the late 1960s there was already a shortage of highly skilled labour in Singapore just to meet the existing need, let alone future demand. Consequently, in 1968 Singapore established the Ministry of Science and Technology to develop and coordinate science policy, technology and technical manpower.

During the 1970s Singapore focused ever increasingly on economic-upgrading strategies in order move away from low-skilled production. Also, throughout the 1970s more Southeast Asian countries began to compete with Singapore for those low-skilled manufacturing sectors, reducing Singapore's advantage. Singapore shifted their planning away from labour intensive sectors and towards manufacturing intensive sectors. As this shift was made there was a significant shortage of skilled workers and professionals. Since this was during times of low-unemployment, to address this worker shortage the government took a two-pronged approach. The first short-term solution was to attract skilled foreign workers and Multinational Corporations and the second longer-term solution was to promote science, technology and research and development. The longer-term strategy was not a simple solution, Singapore lacked the necessary existing workforce with the higher level skills to promote science and technology based sectors. The government addressed this by re-designing the education system to directly support the building up of the skills base to feed in to the growth technology sectors.

To satisfy the demands from higher technology and manufacturing intensive employers the government needed to ensure the skills in demand, would be supplied by the education and training system. This was addressed by strengthening, broadening and centralizing the education system, and by introducing targeted training to upgrade the skills of those already in the workforce. In the 1990s Singapore again revamped their industrial strategy. Singapore would continue to focus on attracting Multinational Corporations, but would target those growth sectors for the future that focused on higher level skills, especially in the technology sectors. At the same time the education system was also adjusted to focus on students abilities especially in innovation, creativity and entrepreneurship while previously the education system had been focused on standardization.

Currently there are several organizations involved in supporting skills development in Singapore including: the Ministry of Trade and Industry, the Ministry of Manpower, the Ministry of Education, the Economic Development Board and various ministerial divisions. The Ministry of Trade and Industry and its operational unit, the Economic Development Board (EDB), have a strong influence on the activities of the others. In Singapore, the priority for economic development determines the process of skills formation, and the mandate of the EDB is to create a sustainable GDP growth for Singapore with good jobs and business opportunities for its people. The Asian financial crisis in the late 1990s and the recent knowledge revolution prompted the Singapore government to change policy into what it is today. The Economic Development Board identified

new key sectors and industries to help Singapore become a global leader in the knowledge and technology economy. For each of the sectors, the EDB developed a strategic plan, containing objectives and targets.

Skills that are required for supporting sector development are identified through a multi-faceted approach. The Manpower Research and Statistics Division undertakes econometric forecasting in order to identify the country's skill needs for the medium, 3 to 5 years, and the long, 5 to 10 years, terms. Decisions about which sectors to investigate are guided by the EDB and these forecasts are supported by inputs from the different sector committees. This approach enables the Ministry of Manpower (MoM) to produce a skills map delineating which skills are in demand and the degree to which Singapore is producing the appropriate supply of skills.

The importance Singapore attaches to matching skill supply and demand is seen in the fact that every six months a cross-Ministerial committee meets to identify the degree to which the country's skill needs are being met. Representation on this committee includes the Ministries of Manpower and Education. Skill needs are converted into the supply of skills through the work of the EDB and the WDA. They do so through the use of the following strategies: an expansion of pre-employment training, upgrading the skills of the existing workforce, and attracting foreign manpower from overseas.

Singapore has introduced a number of incentives to encourage workers to upgrade their skills, including encouraging further learning for those already in the workforce. A series of grants are offered to people who have completed their post-secondary level education, including a payment of \$800 to enable graduates to study for a qualification that has a market demand. A similar grant is provided for polytechnic students to enable them to study for a graduate level qualification. The MoM will also provide 80% of the funds if an education programme leads to a qualification that is in high demand.

The Workforce Development Agency (WDA) plays an equally important role in upgrading the skill levels of the workforce through the following three programmes: skills conversion, skill upgrading, and enhanced employability of lower skilled workers. The skill conversion programme is primarily targeted at workers who have been laid-off due to economic restructuring. The programme provides a worker with basic skills training in an area that has a high market demand. The skill upgrading programme is targeted at older people who already have jobs. The purpose of this programme is to help improve productivity within selected growth sectors. The third strategy is targeted at enhancing the competencies of the lower skilled worker through a programme called Work Redesign. Under this program the WDA attempts to redesign jobs in targeted sectors so that the person becomes more productive. If the MoM or the WDA is unable to develop the skills of local people in response to identified needs then the final option is to search for skilled foreign workers.

The Skills Development Fund (SDF) provides financial incentives for training those people already in the workforce, those preparing to join the workforce, and those re-entering the workforce. The funds are collected from the Skills Development Levy imposed on employers of foreign workers and on employers with workers earning less than \$1,500 a month at a current levy rate of 1% of monthly remuneration. All companies registered in Singapore are eligible for support from the SDF.

We have seen that Singapore was faced with a tough challenge, how to catch-up to more developed economies when they had no natural resource base and a small low-skilled population. They responded by initiating a decades long plan of state managed interventions in industrial development, education and training. Singapore used industrial policies to manage growth systematically up the value chain by targeting sectors they determined would be vital for future growth. They tied-in their education and training policies to overall economic development to ensure that all three aspects worked together to ensure close to full employment and that employers had the necessary skilled workers available.

This development process was very rapid and Singapore succeeded in catching up to developed economies in just one generation. One of the reasons this was possible was because they had the lessons other countries learned during their development process to learn from. Singapore worked hard to target growth towards technology intensive sectors, and once they did so, they could look at skill and education development strategies already tested in other countries and pick those that best suited their objectives. Very little experimentation was necessary. During this progression Singapore focused on centralized, systemized processes to deliver skilled workers in to the market. Singapore has since taken a further step, moving on from standardized education and training towards more ability based education that focuses on innovation, creativity and entrepreneurship to attract high technology industries.

Though Singapore is a very unique country, other nations can use Singapore as an example to assist them in designing their skill development and catching up strategies, because that is exactly what Singapore did. Singapore looked very closely at where they wanted to go, which sectors they wanted to focus on and what assets they had as a nation. They then used off-the-shelf education, skill development and industrial promotion policies, which they adapted to their national context, to very rapidly develop and catch-up to more developed countries. The key was that Singapore was very motivated, highly focused, able to avoid political battles and very strict about not protecting sectors that were not deemed necessary for their goal to move up the value chain.

Hong Kong SAR

Like Singapore, Hong Kong has achieved high growth rates using a human resource development and export sector growth strategy. Hong Kong also covers a small geographical area and economic success has been partly based on developing the skills and competencies of its people. But there are significant differences between the economies of Singapore and Hong-Kong. In Singapore, the government determines which sectors will grow by providing the appropriate incentives and conditions to ensure that investment occurs. In contrast, the administration in Hong Kong plans for the market and attempts to identify which sectors are most likely to experience growth. This forms the basis for economic planning and skills formation in Hong Kong.

Perhaps the most significant organisation influencing skill formation in Hong Kong is the Education and Manpower Bureau. The mandate of this Bureau is to (a) provide a well trained workforce equipped to meet the demands of a dynamic economy and (b) to contribute to the overall economic competitiveness of Hong Kong. The bureau is responsible for manpower projections and for identifying the future demand for skills.

The largest provider of skills in Hong Kong is the Vocational Training Council (VTC). The VTC is a tripartite body representing the interests of employers, employees and academics. A total of 22 people sit on this board and together they determine overall policy and strategy for the sector. This body is responsible for technical education and vocational training on 11 campuses, covering the following subject areas:

- Applied Science
- Business Administration
- Childcare Education
- Information Technology
- Construction
- Electrical and Electronic Engineering
- Hotel Services and Tourism Studies
- Mechanical Manufacturing and Industrial Engineering
- Design, Printing, Textiles and Clothing

The focus of this training is on pre-employment training and programmes of study lead to a diploma or higher diploma level qualification. The emphasis is on developing practical competencies, with 70% of the time spent on practical activities and the remainder 30% on theory. An estimated 160,000 young people graduate from the VTC each year. Historically emphasis has been given to pre-employment training, however recently in response to the changing demographic trends, courses are also being developed for older people currently in employment.

Under the VTC there are 21 vocational training boards (VTB) covering all sectors of the economy, the composition of which are tripartite meaning they include representatives from employers, employees and the government. These boards meet every six months to review their sector and to provide feed-back to the VTC on any important trends within their sector.

A number of other bodies report to the VTC including the Employee's re-training board (ERB), the Apprenticeship unit, the Clothing Industry Training Authority (CITA) and the Construction Industry Training Authority (CITA). The ERB is a statutory body set-up in 1997 to enable displaced workers to re-enter the labour market, particularly domestic workers and security guards. The unemployed person receives training and three months' work experience. The employer also receives a subsidy and around 1,000,000 retraining places have been offered since inception.

The CITA and the CLITA are also statutory bodies. They were established in 1975 to provide young people with training. Funding for these two bodies is provided from a levy on companies operating in this sector. Recently, the CITA and CLITA have begun to offer in-service courses for older workers in response to the demographic changes. The CITA is also carries out trade tests in sectors that have important health and safety considerations.

The country's Apprenticeship Scheme was launched in 1997 to provide on-the-job training for young people in 77 specified trades. Under this scheme employers have to enter into a contract and register with the Apprenticeship Board if they wish to employ a young person. The training lasts for four years. Unfortunately, demand for this type of training has fallen from around 10,000 in the 1980s, to around 3,000 in 2007. A number of factors can account for this decline, ranging from the length of service to the fact that these skills are no longer in demand.

The final scheme, the Skills Upgrading Scheme (SUS) was launched in 2001 to enhance the employability of low-skilled workers by providing them with industry specific skills. However, in order to claim a grant, the training has to occur in an expanding industry and one that employs a significant amount of local people. A total of 24 industries have been identified for skills upgrading. The purpose of this scheme is to enable low skill workers to become more employable in sectors that are expanding.

There is a specific process involved in identifying skills needs and translating them into supply. The Education and Manpower Bureau, in combination with the VTC, are responsible for tracking skills that are in high demand. However, any study on the demand or supply of skills must focus on sectors that are strategic to the country's development. At present the following have been defined as strategic by the country's Economic Development and Labour Bureau: Financial Services, Trading and Logistics, Tourism, Professional Services, Creative Industries and Information Technology Services.

Within each of the above sectors the Education and Manpower Bureau identifies broad macro requirements for the medium term (3 to 5 years). The intention is to provide a general reference or signal to planners, but not specific details on the numbers or specific type of occupations. The methodology involves a two pronged approach, consisting of a number of quantitative projections and a series of qualitative studies. The

quantitative projections identify demand for broad occupational groups in specific sectors and how they change over time. Attempts are made to match future supply by age, sex and educational level.

In addition this is supplemented by qualitative information and a series of establishment surveys, the majority of which are obtained from the 22 VTC. Each of these Councils undertakes a survey of skill requirements in their sector every two years. Additional studies are undertaken to provide qualitative information about changes in the sector, including how global trends, information technology and other factors are impacting on the sector. Where appropriate, the VTC will also establish a committee to look at cross-cutting issues that impact on each sector, such as disability or the role of ICT.

Under this two pronged approach the Education and Manpower Bureau provides the broad macro-economic framework for identifying broad skills areas over the medium term and the VTBs provide specific details about the short-term skill needs within each sector.

How are these skill needs translated into the supply of skills? In Hong Kong the close relationship between the VTC and the VTBs ensures that labour market information is translated into the appropriate action. For instance, each of the VTCs will supply the VTB with information about their sector. In response the VTC will review its annual plan and determine where supply needs to be increased, and, correspondingly, where it needs to be decreased. Attempts will also be made to influence student choice through career campaigns and career guidance.

The way in which courses are funded also has an impact on student supply. For instance, where there is high economic demand for a particular programme of study and one that requires high capital investment; tuition fees will be paid by the state. However, in subject areas where demand is high, and there is no capital investment, such as accounting or business studies, the state will not pay tuition fees. This strategy ensures that state investment occurs in strategic skill areas that the private sector would not support.

The provision of work visas is also used as a mechanism for obtaining skills not available locally. Under this process a firm has to advertise locally, and if they are unable to recruit an appropriate skilled person, they will have to approach the immigration board for a work permit. In turn, the immigration board will approach the VTC to find out whether this skill is short supply. If the application is approved the employer will be required to pay a levy. This levy will be subsequently used to support the upgrading of local skills through the employees retraining scheme.

There are also two other bodies that respond to employment and skill needs, namely the University sector and the country's Employment Services. The University sector has no direct relationship with the VTC and reports directly to the Ministry. As a consequence the Universities are responsible for making their own decisions about the labour market, with the result that the majority identify what are the most appropriate courses for the market place.

With regard to the Employment Services, they offer a free recruitment services to employers and job seekers. There are a total of 12 job-based centres and each is linked by an interactive employment website. This website enables employers to register their vacancies and job seekers to register their CV. In order to support this process of matching vacancies to employee, there is a telephone employment service centre and a processing centre. The employment service centre handles over 600 calls a day and the processing centre receives around half a million vacancies from employer each year.

The country's Employment Services also provide the following active employment measures for the unemployed: (a) an employment programme for the middle-aged, (b) a work trial scheme and (c) a youth pre-employment training programme. The first of these, the employment programme for the middle-aged,

provides employers with \$1500 if they employ a job seeker who is aged 40 and above for 3 months. This provides a means by which an employer can screen potential workers. The work trial is similar and last for around a month, providing the unemployed person with exposure to the workplace. The final scheme provides school leavers with work-based training for a period of 8 months. The employers receive an incentive of \$2000 per month for employing a young trainee.

South Korea

South Korea has been able to sustain rapid development for more than four decades, averaging 7% over that time. At the core of this growth was a government-led skills development strategy coordinated with rapid technological change and equal income distribution. South Korea who was one of the world's poorest countries, with a per capita income of less than \$100 in the early 1960's, has now emerged as a major economic power ranking as the 11th largest economy worldwide. In the space of one generation, Korea has transformed from a rural economy to an industrialised economy with highly competitive international corporations. Since technological skills and competencies are the main determinants of labour productivity, investments in new skill development and capacity building have been crucial to Korea's competitiveness.

The basis of South Korea's growth has been an increase in skills and productivity coupled with a guided economy that did not rely on its initial advantage in labour intensive low-wage industries, but re-structured its industry into one which is capital, skill and R&D intensive. Targeted policies created specific high-tech industries and knowledge-based sectors. New technologies imported have been further developed through internal R&D investment and now competes in the global market. The policy to adopt new technologies and catch-up R&D strategies enabled a rapid improvement in productivity and income levels.

As already mentioned, a key driving force in the development process in Korea has been the upgrading of skills; a well educated and highly skilled workforce is complementary to the adoption of new technologies. The enlargement of the skills base which has taken place in Korea through formal education has been the fastest in the world. The average education attainment level has increased from 7.6 years (1980) to 11.2 years (2005) and now converges on the OECD average. Korea achieved universal primary education in 1960; for middle school in 1985 and for high school around the mid-1990s, although not free. The result is that the share of the general population with at least upper secondary education in the 25 to 34 age group is the highest in the world. At the higher education level performance is more pronounced as the system moved to one providing mass education. The Korean government also prioritised vocational and technical education (VET) within the formal school system so that almost 40% of high school graduates came from a vocational or technical high school. The greater the investment in education, the greater the creation of the pre-conditions for successful firm-level training and for moving from generic skills to specific competencies needed for increased productivity. In Korea the number of workers trained by firms has also increased from less than 100,000 in 1970 to almost 2 million in mid 2000.

Apart from government investment in education and training, other factors have also contributed to the expansion of the skill base. Sustained high growth rates, rapid technological change, economic restructuring, and equal income distribution all contributed to the creation of incentives for the private sector to invest in education and training. The rapid change in technology and the structure of industry brought about increased job opportunities. These changes intensified incentives to invest in education. Therefore rapid change in industry and employment in Korea favourably influenced the increasing demand for education. The strategy of opening up markets also made its own contribution to the expansion of the skill base. Investment in human capital has its maximum impact in a competitive environment, the larger and more competitive these markets are, the greater the prospects for using skills. As the economy opened itself to international markets, demand

for skills increased and provided incentives for education. Thus a cycle was created where education and growth reinforced each other and both contributed to welfare.

Importantly, in terms of educational system decisions, economic needs took precedence over the needs educators and parents. Education and training were expanded within a framework of government policy where the industrial infrastructure and skills were developed together. Government strategies for evolving education policy in tandem with the changing needs of industry worked effectively and changing demands for human resources were met. There was a planned sequential expansion of education by school level with priority being given to each level starting with primary education and then moving to subsequent levels as the needs of the economy demanded. Initially the policy emphasis was on basic education. Access to primary education was opened up prior to industrialisation. Targeted investment at this level through the 1950s enabled emphasis on investment in middle schools in the 1960s. This was followed by an expansion of high school education in the 1970s. In parallel with the industrial policies of promoting heavy and chemical industrialisation in the 1970s government spearheaded an increase in provision at vocational high schools and junior colleges. Higher education expansion was limited to the areas of science and technology and, as a result, there was no substantial growth in higher education until the mid 1980s when it was strategically expanded. This sequential approach to the development of the education and training levels contributed to a planned approach which prevented skill shortages or over supply coupled to a phased integration of all sectors into economic growth.

The movement towards higher value-added industry was accomplished without major skill shortages. In a rapidly growing economy it was important that labour supply should be congruent with the demands of the economy. Because of the time-lag between skill investment and output of skilled workers, prior forecasting of skill demand and investment priorities was necessary for government. The strategies used for planning skill development made it possible to invest in human resources earlier than the appearance of actual demand. In the 1970s the major shift in economic policy to heavy engineering and chemical industries was reflected in an expansion of vocational and technical courses at secondary and higher levels and in the introduction of a vocational training system. In the 1980s the expansion of higher education preceded the knowledge-based economy. In the 2000s the government made a decision to base budget allocations on a forecast of strategic sector skill supply and demand. In this way policy was driven by a planning model not merely based on past or current skills needs, but on future expectations based on an interpretation of global markets. This was possible because government had clear industrial policy targets.

In the initial period of industrialisation there was a tendency to rely on manpower planning which was the basis of planning educational provision since the mid 1960s. However, a concentration on manpower planning and centralised coordination can lead to imbalances. Parents and students follow signals from the labour market which indicates that general education yields highest returns. By contrast government policy invests in vocational and technical education. South Korea's manpower planning was not successful in controlling education flows and was abandoned in 1991. Centralised manpower planning of specific skill supply to meet estimated demand is now generally discredited. Over emphasis on quantitative manpower planning and coordination leads to a neglect of attention to specific skill qualities.

Skill development was led by government and complemented by the private sector. Government played a leading role in directing skill development and ensured continual upgrading of the workforce in order to move industrialisation from low to high value-added sectors. Government tightly controlled the education and training systems to ensure that output matched economic needs. Government ministries controlled curriculum, standards and assessment at each stage; it also supervised student quotas and entrance tests, staffing levels and resource allocation. Specifically in the field of training the state played a leading role in channelling young people into vocational schools to ensure adequate output. Despite this high level of state control of education and training, the private sector played a major role in the expansion of the skill base. The private sector,

however, received resources from government in the form of tax exemptions, subsidies and loans. The Private School Law extended government control over the private sector's admission policies, finance and curriculum at both school and college level. Government control of the private sector was also exercised through selective targeting of funding and through enrolment quotas.

The government has consistently expanded vocational skills training for the needs of industry. VET programmes, which were a central element in economic planning for capital intensive industrialisation, were initiated in the mid 1970s to meet needs for semi-skilled manpower in the engineering and chemical industries. As a result of a mid 1970s decision to increase investment in VET oriented secondary education; government provided a number of financial incentives. Over time rapid change in the structure of industry reduced the demand for a semi-skilled workforce. Graduates earned lower wages and had poorer employment prospects than graduates from academic programmes resulting in a perceived lower status. Since the mid 1990s, government refocused vocational education to junior colleges and polytechnic universities; vocational high schools were no longer seen as terminal and junior colleges were mandated to perform a critical role. However, this policy did not solve the problem of low investment, low labour market outcomes, low prestige and weak linkages with industry. Government supplemented the supply of skills through the use of a public training system in the form of vocational training institutes and in-plant training. By 1986, the output of workers from these institutes amounted to more than 350,000, which equates to almost 3% of the labour force at 1986 levels.

The principal system of vocational training in South Korea was the system of mandatory in-plant vocational training. It was obligatory for large companies to train their workforce or alternatively to finance a public vocational training programme. For this purpose a Levy was imposed if firms failed to train a minimum percentage of their workforce. The initial stages of this scheme in the 1970s were considered successful in raising numbers of workers trained within industry but numbers later fell dramatically in the 1980s after government relaxed its policy of boosting heavy industrial and chemical industries. It was later increased again in the 1990s but an increasing number of firms have a preference for paying the levy than training their own workers. As the output of graduates from colleges increased, companies did not see the need to develop training on their own. Mandatory training was discontinued in 1999 when it became part of the employment insurance programme. In 1995 a new training system known as the Vocational Ability Development Programme (VADP), was introduced as part of the Employment Insurance Scheme (EIS). This replaced the mandatory in-plant programme. VADP is funded by employers however it differs in that it is an incentive system which allows employers the option to choose the most suitable training for their own needs and also encourages employer-based training. Secondly, the focus shifted from initial training for new recruits to further training of existing employees. Thirdly, the scope of subsidising vocational training was expanded to include not only employer-provided training but also self-directed training for employees and, also, training for the unemployed.

The post 1997 growth trends exposed the problem of supply-driven expansion of higher education and skill mismatch in which workers at both low and high skill levels were in short supply while middle levels were oversupplied. It is considered that the cause of youth unemployment is the mismatch between demand and supply of college students. One third of college graduates have indicated that their major field of study did not match their current occupations. Links are lacking between colleges and the business sector and lead to higher in-plant training costs and lower competitiveness. It is not considered that a return to the old government-led matching of supply and demand will solve the problem. Solutions will have to be found in a strengthening of cooperation between industry and the education institutions.

In 2001 the Ministry of Education was given the remit to oversee and coordinate all human resource development. This placed human resource development as a core strategy for national development, and

placed a central agency in charge of HRD policies rather than the previously dispersed responsibilities. This had the effect of reinforcing and reforming government's role in skill development and enabled it to comprehensively plan human resource provision. This new system has some shortcomings in that this ministry does not have a budget planning and allocation function and there are still overlaps between central government level committees in HRD issues.

WTO regulations make it difficult for governments to subsidise targeted industries, South Korea still has policies to foster industries which are of strategic importance nationally, through subsidisation of R&D and HRD. Government sees that high quality human resources are a must to maintain continuous growth and for the knowledge-based economies of the 21st century. While it is difficult to identify skills needs for the next generation of leading edge industries it is possible to identify the qualities which will be required. Government demands that graduates completing programmes should best fit the industrial needs after graduation without additional in-plant training; universities must, therefore, deliver custom-made skill development programmes to meet national strategic industries. The coordination between government agencies, industry and academia makes these policies successful.

Enhancement of competitiveness of firms and workers performance is strongly influenced by training. In this respect continuous education and lifelong learning are becoming increasingly more important. Despite this, lifelong learning has played a minor role in the case of South Korea where participation rates have been among the lowest and investment by firms in training has been stagnating and work remains to be done.

South Korea has upgraded its economy and industrial infrastructure over the past four decades and has, at the same time, upgraded its skill development system. Although there have been periods of apparent mismatch and imbalance between supply and demand, and there are still many problems to be solved, the skill development system has contributed systematically to the transformation of industry and to economic development. Policies were successful in matching supply with demand. The experiences gained provide notable policy implications for other countries which aim to transform their economies and industrial structure. These are: 1. There must be close congruence between skill development systems, government's role and the stages in economic development; 2. While it is difficult and inefficient for government to directly control the whole process of skill development, government does have a role to promote behaviour of stakeholders to the advantage of social and national goals; 3. Participation of social partnership between stakeholders is becoming more important, skill development systems exclusively regulated by the state fail to meet actual needs of firms; 4. Higher education for the masses was achieved without significant secondary level VET. This illustrates that late specialisation is possible and that a combination of general education and in-plant training may be efficient models in a high growth economy; and, 5. Maintaining a balance between quantitative expansion of the skills base and issues of equity and growth are possible.

Vietnam

Vietnam is a relatively poor country with a per capita GDP of \$711 (2007). However, economic growth since the launching of the Doi Moi reform in 1986 has been high by international standards. Moreover macro economic reform policies have changed from reacting to immediate problems to progressively evolving towards longer-term integrated development strategies with the initial stages of transition towards market structures complete.

The Doi Moi reforms focused on three major sectors: food production, consumer goods and export commodities. These reforms coupled with the dissolution of the USSR accelerated development in Vietnam at the end of the 1980s. Vietnam also initiated a structural adjustment programme including devaluation,

redefined the role of the Central Bank and created commercial banks, abolished subsidies for housing, education and health, introduced of user fees in health and education, and introduced import quotas. Favourable conditions were thus created for the development of a multi-sector economy. In this stage the approach was pragmatic and reforms mainly aimed at opening up the economy to new enterprises. By 1990 the task of setting up an enabling legal environment had begun; a new constitution was adopted in 1992 acknowledging the role of the private sector and new legal instruments were adopted covering investment, bankruptcy, the labour code and downsizing in the civil service.

The reform of the state sector has allowed competitiveness to increase and it has remained the main contributor to national production with 40% of GDP while the private sector held 10% in 2006. Foreign investment grew and was 13% of GDP in 2006. In the past 20 years the production system has undergone major changes; non state actors have become prominent; foreign investment is the engine of growth mainly in industry and construction. Manufacture of food products and beverages is a principal sector followed by the extraction of crude petroleum and natural gas. The relative share of labour intensive industries has slowly declined in favour of high value sectors and the manufacture of electrical and electronic equipment has increased its share of production from 2% in 1976 to 7% in 2006.

Vietnam derived inspiration from a number of successful economies including South Korea where we have seen there are significant initiatives for skill development for accelerated growth. These and other steps taken were significant enough to allow Vietnam to engage in a process of normalisation of international political and economic relations. However, in the later 1990s growth appeared to be slowing down and there were still limitations within current structures. The response from Vietnam was a further series of legislative reforms, a shift from controlling to enabling. The targeted sectors were prioritised to maximise spill-over effects, special economic zones were planned and introduced high-tech parks as 'areas of specialisation' in research and application of new technologies. All regions and provinces prepared Master Development Plans in order to improve coordination with the National Development Plan.

Education and skill development has remained a priority. Improvements have been made in general education and the percentage of the population acquiring grade education increased from 80% in 1979 to 87% in 1999. While in higher education it increased from 1% to 3%. The education system was reformed in 1979 and designed to increase relevance to economic and social needs with an emphasis on upgrading science and technology levels to international standards. The 2001-2010 Education Development Strategy is the first medium term education strategy document for education and training and national targets have been outlined. Public resources devoted to education have increased from 15% in 2000 to 19% in 2007. Primary and secondary education have received 48% and 6% respectively from current funds and 30% and 24% from capital funds in 2002. The strategic plan shifts emphases to the universalisation of secondary education and enrolments have increased.

The education sector remains plagued with a number of problems leading to much public criticism which relate to lack of transparency and efficiency in the system, lack of relevance to the labour market, poor quality and limited access to higher education. Efforts have been made to introduce new teaching methods and to improve quality and some of these initiatives have been successful. A new curriculum is being progressively introduced from 2002. The central planning legacy still has a strong hold on systems and despite innovations agencies have little inclination to cooperate and share information; thus cooperation between MOET, Ministry of Finance and Ministry of Planning and Investment is limited. A new Education Law enacted in 2005 and a number of decrees and decisions have been taken to try to improve transparency and efficiency. There has been a new thrust to the reform agenda and the education and training landscape is changing fast.

Vietnamese education also suffers from access limitations and poor quality. While infrastructure and resources are generally considered adequate curriculum needs revisions to attract students and to meet contemporary needs of employers. Teachers are insufficiently qualified and are trained to meet the needs of a centrally planned environment and not those of a market economy. Revisions of the law in 2005 were the result of acknowledgement of shortcomings in the system and qualitative and quantitative targets have been set to improve science and technology. A complete revamping of the tertiary system has been launched from the 2007 school year. Privately run tertiary education will be open to foreign investment while publicly run institutions will seek foreign cooperation, with the aim of creating institutions meeting international standards by 2020. This next step will give autonomy to institutions and replace management control by quality control.

Compared to general education, vocational education and training (VET) had lagged behind in terms of its ability to reform and meet the demands of the economy. Learners are not attracted to VET which is seen as limiting earnings and as a result prefer to go to higher education. VET has traditionally been seen as a second option for failed university entrants. A further reason is that VET has been previously organised to meet the needs of the state sector, equipment is outdated, teachers need retraining, schools lack capital and other resources and there is a credibility problem.

Realising that the graduates of VET could not meet the needs of the economy in 1991 a merger took place between the Ministry of Higher and Secondary Education, and the Ministry of Education to form the Ministry of Education and Training which is in charge of all levels and types of education and training. By the end of the 1990s Vocational Training was transferred to the Ministry of Labour while secondary technical and vocational education remains with MOET. Vocational training is provided in short term programmes in training centres at the local level and is generally combined with Placement Centres. Training has suffered from a lack of resources, but training is provided free of charge.

Private training centres have grown but do not produce workers with a trade skill. Quality has also been an issue as there has been no mechanism to control standards. Graduates from general education face increasing difficulties getting the qualifications they need to get a job. Dissatisfaction with the system prompted government to formulate new legislation in 2006 which redefined the types of vocational training and vocational education and reorganises provision, placing more emphasis on modularisation of content and involvement of employers in content development.

Before 2000, little attention was paid to the science and technology sector. The objective of the 2000 Law on Science and Technology was to provide the enabling conditions for the development of the sector. Science and Technology activities were placed under the authority of the Ministry of Science and Technology; research was conducted in two autonomous academies with each including a number of specialised institutes and research centres in their respective fields. In 2000 there were 1,100 research and development organisations, 500 of which are non-state organisations and 197 are universities and colleges. Since the end of the 1990s a process of rationalisation was implemented in the organisation of research to enhance efficiency. Central planning legacies continue however and cooperation in the reform has been slow.

The Science and Technology Development Strategy to the year 2010 identifies weaknesses and failures of previous plans and sets out objectives to ensure that the scientific foundation is provided for accelerated industrialisation, successful integration in the global economy, and that it plays a role in improving the growth of the economy. The strategy clearly sees that catching up in these areas is key to development and plans to set up Research and Development institutions in key technology fields. Specific strategies were not defined, because it was felt that demographic factors determined the size of the labour force; that education, training and health determined its quality; and growth determined employment creation. Consequently, family planning, education and training, health and growth policies have been the main tools of state intervention;

employment policies have been mostly confined to self-employment generation through credit schemes. A fund was established in 1992 to provide loans to small scale self-employment projects, enterprises and families in the 'new economic zones'.

There have been many consequences of the dismantling of central planning. Training and human resource skill development are tools to allow the labour force to adjust through market mechanisms. Following the development of industrial zones and export processing zones, the focus in major cities shifts towards wage employment in industry, particularly in the south where labour intensive industries such as textiles develop more quickly. Progressively migrants upgrade from seasonal hired labour to contracted industrial wage-labour which is facilitated by an increase in the general level of education of the labour force. Enterprises mainly require unskilled but educated labour and recruit on the basis of age and health criteria, thus favouring youth. The share of enterprises in total employment increased from 6.8% in 1995 to 14.4% in 2005; this change reflects the arrival of new employers on the labour market. Private enterprises and domestic companies represent almost 11% of total employment and 9.4 % of GDP at 2005 prices. The household sector represents 87% of employment and only 3% of GDP. Employment in foreign enterprises has increased from 82,000 in 1995 to 1.2 million in 2005, an average annual increase of 28.7%. The contribution of foreign investment is particularly significant measured in terms of wage employment. FDI is mainly directed towards industry and represents 41% of total production in 2001 in four concentrated sectors –leather, fur, food and beverages. The relatively high level of education of the labour force compared to cost is a comparative advantage for Vietnam which has a domestic market of around 85 million people with an increasing purchasing power.

The skill level of the labour force has improved over the ten years from 1996-2005 with a decline in the share of unskilled workers to 75%. The structure of qualifications remains that of a developing rather than a developed economy. Skills in demand include specific technical skills, language, management and computing. In 2007 the Ministry of Education declared that 'too many graduates have not been equipped with the skills needed for work nor have they sufficient knowledge of society'. Issues of quality became important around this time and steps were taken to address quality. Two features are of concern: the number of workers with elementary training remains high although decreasing proportionately, and the unemployment rate is highest for the better qualified workers, signalling employability problems. Diploma holder unemployment increased and has been a concern for the government. One issue is the lack of facilities for recruitment of workers but Universities have begun facilitating placement of students.

Wage employment has grown rapidly in Vietnam over the previous ten year period but is mainly in low skills and labour intensive industry. Technology levels within industry are low and equipment is outdated. The development of FDI has not brought the expected spill-overs in terms of skills enhancement and as a consequence the bulk of the labour force holds unskilled positions and has limited access to training. A survey conducted in 1999 indicated that 22% of enterprises declared having recruitment problems, this was particularly acute in foreign enterprises and to a lesser extent in domestic enterprises. An additional feature was the high turnover of employees which may be explained by salary and working conditions. This survey showed that enterprises working for national and international markets face more recruitment difficulties than those which work at the provincial and district levels. The country has not yet been able to meet the increasing need for skilled labour brought about by opening up the economy and foreign market competition. As a consequence, and despite control measures, the number of foreign workers has increased with the number of new foreign-owned enterprises.

The experiences of Vietnam illustrate that strong political commitment can have a major role to play in development; much has been learned from the reform process and strategic planning capacity has improved considerably since the late 1980s. Structures have moved a long way from the levels of 1986 to its status as the potential 'new Tiger' of Asia. The first stages of reform aimed at stabilising the economy and establishing

conditions for markets to function, rather than to a development strategy. A series of five and ten year national plans provided policy and strategy for the period. This involved legal and institutional reforms which were necessary to inspire confidence in potential entrepreneurs and foreign investors. This strategy has proved successful and with the exception of the Asian crisis, the economy has developed considerably. By the end of the 1990s industrialisation and modernisation of the economy were taking off. Policies and strategies needed to be scaled-up and integrated and this could only be undertaken with full support from the population and assistance from abroad.

Strong and sustained commitment from the government have resulted in major achievements, economic growth and significant poverty reduction. In terms of skill development, while there has been progress it is not considered that progress has been up to expectation. Some observers contend that Vietnam has followed a traditional approach to development but has paid increasing attention to skills development as a key to rapid industrialisation. For Vietnam's continued rapid growth, skills development policy should emphasise maximising productivity effects of foreign investment and should focus more on specialisation in order to avoid confrontation with China. Recent decisions on skill development show that Vietnam is so far still transposing methods that have proved successful for industry (attracting foreign investment and setting up growth points) to the education, training and science/technology sectors. There is no guarantee that this policy will have spill-over effects on the education and training system.

Conclusion

The four countries examined here Singapore, Hong Kong SAR, South Korea and Vietnam have all recently entered high growth trajectories. These governments have been able to over a relatively short period of time kick-start their economies and achieve world-leading growth rates. Furthermore they have been able to sustain these high growth rates and achieve significant increases in GDP and living standards in only decades, something that often took other nations centuries to do so.

The World Bank has noted certain economic conditions of "macroeconomic stability, sustained growth in productivity and significant investment in technology, and continued investments in human resource development" that were the precursors to these high growth trajectories. While these qualities may be necessary for rapid growth, they in no way ensure rapid growth, or even ensure any growth at all of a national economy. Many other nations also share these macroeconomic characteristics but they have not yet experienced similar growth trajectories.

However, the achievements of Singapore, Hong Kong SAR, South Korea and Vietnam were not accidents. They only occurred because of specific government guidance, planning, policies and interventions. Experience has shown that markets alone cannot in a timely manner coordinate education and training for people so that skilled workers are available in the labour market when employers need them. Markets fare even worse when planning for long term future needs is necessary, not just in terms of what skills are going to be in demand in the labour market, but what sectors will be the growth sectors in the medium and long term and what skills will be needed by them then.

While there is no 'magic bullet' promising rapid economic growth, these four countries did achieve rapid growth because of their deliberate and planned actions, not by chance or accident, and a significant part of those actions were skills formation policies that were linked to sector development policies. The development progression for the Tiger Economies has been one of investing in skills formation to attract investment in higher value-added industries, moving up the value chain through growth from low to high technology sectors, raising productivity, improving competitiveness and increasing exports. The continual development

and application of skills in this context has been a necessary ingredient for development. Skill and human resource development is not a simple task as has been shown by these four case studies. However, nations that ignore significant skill development for their workers become trapped in a low skill trap where they remain stuck with low-wage and low value-added industries because the workforce is never transformed through acquiring higher skills. Not only is it essential to raise current skill levels, it is vital to plan for those skills that are needed in the near future, taking into account what skills will be needed by the more advanced sectors that will drive future growth.

These four country case studies attempted to show why some countries grow more quickly and how the implementation of successful skill development policies in those countries is a large part of that success. The study of existing skill development and sector approaches will help other countries be in a better position to develop tools that take into account their own specific cultural, historical and political context in which skill development approaches are being implemented. That is to say in different regions of the world countries will implement skill development approaches according to their own institutional and political structures, and it will be important for any tools to be sensitive to such nuances. Each country around the world will approach skill development based policies in their own unique way and it will be important for them to ensure that their tools can match the circumstances under which they are being applied. The failure to do so will result in a disarticulation between the needs of employers and the supply within the labour market restricting economic growth and limiting their citizen's standard of living.

About CEI

The Centre for Employment Initiatives (CEI) is a not for profit making organization that has been providing technical and advisory services in the field of Employment and Human Resource Development for over 15 years. Much of CEI's current work focuses on providing policy oriented advice to governments, donors and development partners around the globe. The key philosophy underpinning CEI's approach is that successful labour market reform can only be achieved through inclusive practices, good governance and accurate and up to date information. For more information about CEI's work please go to www.cei-international.org.

Note: Some of these case studies are based on a series of longer country case studies compiled by CEI for the International Labour Organization (ILO) for distribution at the 2010 G20 conference. Those case studies are in turn based on even more in-depth analysis and country case studies. The longer original CEI case studies contain references to the original source material, where applicable, and can be downloaded from the ILO's website at www.ilo.org.