

## Innovative Capacity, Human Capital and Its Contribution To Economic Development In Malaysia

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*Recent theoretical contributions to the growth literature emphasize the role of human capital in the process of economic growth. The most crucial element in economic growth is the link between innovations and economic development. This relation is bidirectional: which is, innovation can foster economic development and some level of economic development is needed to produce innovations. Malaysia's Prime Minister in his Budget 2012 address in Parliament announced various incentives to encourage human capital development as well as instill a culture of innovation to move the local economy to a higher level. To transform productivity, significant improvements are required. Therefore, skilled human capital is vital for Malaysia's economic growth. An important factor for sustainable economic growth in an increasingly competitive business world which thrives on a knowledge-based environment is to have skilled and knowledgeable workers. Malaysia government has pursued a strategy, which is Economic Transformation Programme (ETP) to achieve high-income status and to propel our economy to achieved Vision 2020. With the National Key Economic Area (NKEA) and National Key Reformation Area (NKRA) in ETP that focused on the future generations, the Human Capital Development Strategic Reform Initiative (SRI) is a critical enabler for Malaysia to transform the workplace as well as the workforce. One of the policy recommendations is focusing on up-skilling and upgrading the workforce. This paper highlights that skilled human capital and innovative capacity are crucial elements in driving Malaysia's economic growth.*

**Field of Research:** Innovative Capacity, Skilled Human Capital, Economic Development, Knowledge-based Economy

**JEL Codes:** I25, J24, O15, O31

### 1. Introduction

Vision 2020 is a Malaysian ideal introduced by the fourth Prime Minister of Malaysia, Mahathir bin Mohamad during the tabling of the Sixth Malaysia Plan in 1991. The vision calls for the nation to achieve a self-sufficient industrialized nation by the year 2020. In order to achieve Vision 2020, Mahathir lamented that the nation required an annual growth of 7% over the thirty-year periods (1990–2020), so that the economy would be eightfold stronger than its 1990 GDP of RM115 billion. This would translate to a GDP of

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RM920 billion (in 1990 Ringgit terms) in 2020. Along with that, to ensure Malaysia achieves Vision 2020, the fifth Malaysia's Prime Minister, Abdullah bin Badawi initiated five regional economic corridors, namely the Northern Corridor Economic Region (NCER); Iskandar Malaysia, East Coast Economic Region (ECER); Sarawak Corridor of Renewable Energy (SCORE); and Sabah Development Corridor (SDC). These economic corridors are very important to propel the economic growth of this country. The government has introduced these economic development corridors as part of nationwide development efforts. Malaysia's Prime Minister Dato' Sri Najib Tun Razak has pursued this strategy, which is Economic Transformation Programme (ETP) to achieve high-income status and to propel our economy to achieved Vision 2020. To ensure Malaysia sustain a high economic development and achieve Vision 2020, not only economic corridors but ETP also play important role.

With the Education National Key Economic Area (NKEA) and National Key Reformation Area (NKRA) in ETP that focused on the future generations, the Human Capital Development Strategic Reform Initiative (SRI) is a critical enabler for Malaysia to transform the workplace as well as the workforce. One of the policy recommendations is focusing on up-skilling and upgrading the workforce. Human capital is critical to the success of the economic development in Malaysia. To transform productivity, significant improvements are required. About 32 percent of Gross National Index (GNI) contribution, require direct investments in human capital (Prime Minister's Department, 2010). This paper will examine the innovative capacity of Malaysia human capital and economic development, as above mentioned fact, that human capital is the crucial factor in economic growth. The research will examine the connection between innovative capacity, human capital, and economic development. Gössling and Rutten (2007) stated that, the most crucial element in economic growth is the link between innovations and economic development. This relation is bidirectional: which is, innovation can foster economic development and some level of economic development is needed to produce innovations.

According to Malaysia's Prime Minister, Dato' Sri Mohd Najib bin Tun Haji Abdul Razak, human resource plays a key role in maintaining a competitive business advantage in any given industry. In ETP and economic corridors, strong emphasis on human capital development ensures a steady supply of skilled and semi skilled manpower to meet the needs of the expanding industrial and services sectors. An important factor for sustainable economic growth in an increasingly competitive business world which thrives on a knowledge-based environment is to have skilled and knowledgeable workers. Therefore, skilled workforce is vital for the economic development in Malaysia. Government will be constantly aware of these fast-changing trends and requirements in identifying the future supply and demand for human capital. In ETP and regional economic corridors, education sector plays important role. Such as, education is an economic driver and a catalyst for growth in this country. Furthermore, education is a key enabler that supports the growth of other sectors such as agriculture, manufacturing and tourism in terms of human resource and capability development. Success of the ETP and economic corridors depend not only on a quality education, acquiring knowledge and in-depth expertise in science and technology but

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also in entrepreneurship and innovation to fulfill the desired human capital requirements in the country's future development.

This paper is a theoretical paper based on later empirical paper. Hence, this paper will cover the following objectives. First, this paper will examine the relationship between human capital and innovative capability towards economic development. Second, this paper will determine the important factors to strengthen the human capital that will foster innovative performance.

The outline for this paper is organized as follows. It provides an overview of the economic development in Malaysia. The review begins by discussing the problem in the current Malaysia situation. Then, it discusses the importance of innovative capacity and human capital to the economic development in Malaysia. This section reviews previous studies on relationship between innovation and economic development. Then it reviews the importance of human capital to economic development. Next, this section discusses the relationship between human capital and innovation and both will contribute to the greater economic activity. This chapter continues with the discussion of the importance of knowledge-based economy as the platform for Malaysia to achieve Vision 2020. Last but not least, it reviews the Malaysia's ranking in World Competitive Yearbook.

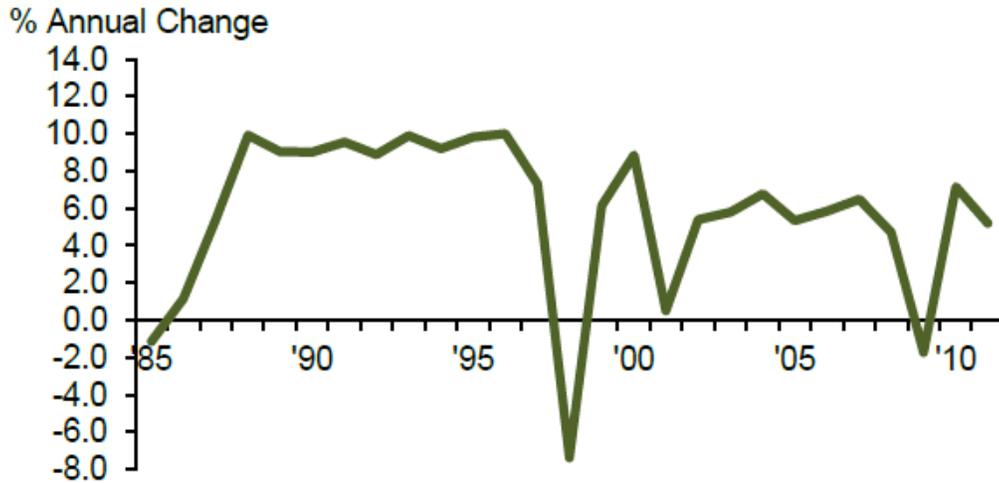
## **2. Literature Review**

### **2.1 The Malaysian Situation**

Malaysia is at a critical point in its economic development. It is more difficult to generate high rates of economic growth in an increasingly competitive global economy. Growth can no longer be taken for granted, but needs to be earned. Therefore, Malaysia government has pursued a strategy to achieve high-income status. The government has embarked on an Economic Transformation Programme (ETP) to propel our economy to achieved Vision 2020. Successful implementation of the ETP will see Malaysia's economy undergo significant changes to resemble other developed nations. A large part of the reason for this relatively poor growth performance has been low innovation capacity in human capital (Performance Management & Delivery Unit, PEMANDU). Therefore, significant improvements are required such as, enhanced investments in human capital has to be made to support a high-skilled, knowledge-based and innovation-intensive economy. Graph 1 shows GDP in Malaysia from 1985-2011.

Graph 1

**Gross Domestic Product, 1985 - 2011**



\* Data for 2011 is an estimate

Sources: Economic Planning Unit, Ministry of Finance, Department of Statistics & Bank Negara Malaysia

To ensure Malaysia sustain a high economic development, ETP and economic corridors play important role. During the Ninth Malaysia Plan, the Federal Government embarked on a number of initiatives to promote balanced regional development and accelerate growth in designated geographic areas. The 10th Malaysia Plan built on the Ninth Malaysia Plan by prioritising and accelerating the development of urban conurbations focusing on five corridors, in addition to the Greater Kuala Lumpur/Klang Valley development. Each corridor consists of high-density clusters with sectoral and geographical advantages. By adopting a cohesive approach to the progressive development of the five regional cities economic corridors, Malaysian will enjoy much stronger economic growth as a nation. (Dato' Sri Najib Tun Razak, Prime Minister of Malaysia). Not only that, by coordinating execution and monitoring, the aim to achieve high-income nation status will not only be achievable and sustainable but will also be inclusive, enabling all Malaysians in all regions to enjoy a high quality of life.

The development, up-skilling, upgrading and delivery of the right talent (Strategic Reform Initiative, National Economic Advisory Council) required to drive growth in priority sectors is the key ingredient in the overall socio-economic development of the nation and is one of the main considerations for investors in selecting potential investment locations.

Table 1 shows Innovation Capacity Index (ICI) from 2010-2011 in high income countries. Malaysia is clustered as upper middle income country and Malaysia ICI rank and score are, 39 and 56.4. To achieve high economic development nation, Malaysia has to be in higher ICI rank and knowledge-based economy such as Korea. The knowledge-based economy will provide Malaysia the platform to sustain a rapid rate of economic growth and enhance international competitiveness so as to achieve the objectives of Vision 2020. This paper highlights that skilled human capital and innovative capacity are crucial elements in driving Malaysia's economic growth.

**Table 1: Innovation Capacity Index (ICI) 2010-2011: Country Clusters**

High-Income Countries			
Name of country	ICI Score	Name of country	ICI Score
Sweden	80.3	Portugal	56.7
Switzerland	78.1	Italy	56.7
Finland	76.1	Malta	54.6
United States	74.8	Greece	49.9
Denmark	74.3	Taiwan	72.5
Canada	73.6	Israel	67.5
Netherlands	72.8	Republic of Estonia	60.5
Luxembourg	72.2	Hungry	56.8
Republic of Korea	72.1	Slovak Republic	56.7
Norway	72.0	Cyprus	55.2
New Zealand	71.3	Republic of Croatia	53.2
United Kingdom	71.3	Trinidad and Tobago	47.7
Japan	70.2	Singapore	76.7
Australia	69.4	Hong Kong SAR	71.4
Ireland	69.1	United Arab Emirates	58.9
Iceland	69.0	Bahrain	57.0
Germany	68.9	Qatar	55.9
Austria	66.7	Saudi Arabia	54.1
Belgium	66.1	Oman	51.8
France	65.3	Kuwait	51.3
Republic of Slovenia	59.1	Spain	58.8

Sources: Innovation of Development Report, 2010-2011.

## 2.2 The Importance of Human Capital and Innovation in Economic Development

The paper is motivated by Strulik’s (2005) statement that while economic growth is explained through innovation, it is ultimately driven by (educated) human capital. At the same time the innovativeness of a particular region attracts educated human capital to that region (Faggian and McCann, 2009). Numerous studies and comparative research elaborate aspects of the innovative and technological capacities of individual regions and countries. As the literature on innovation systems and clusters suggests, innovation performance is unevenly distributed across the geographical landscape (Moodyson et al., 2008). That is why this paper highlights that skilled human capital and innovative capacity are crucial elements in driving Malaysia’s economic growth.

The second main element in empirical investigation concerns human capital education, which is viewed here as a workforce characteristic related to education, knowledge, and skills, as described in previous literature on human capital (Alquézar Sabadie and Johansen, 2010). In the past few years, human capital theory (Schultz, 1961; Becker, 1964 and Mincer, 1974) has attracted much attention by confirming the causal relationship between education and economic growth, especially in a developing economy like Malaysia. This is because the human capital theory maintains that economic development can be achieved and sustained by an educated and productive workforce. Since the explication of the human capital theory, many studies have been

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conducted in both developed countries (Cohn and Addison, 1998) and developing countries (Psacharopoulos, 1985 and Psacharopoulos, 1994). Most studies support a positive causal relationship between formal education and increased earnings in developed countries.

Human capital, generally seen as a set of knowledge, abilities and skills of the individuals, used in the activities that stimulate economic growth and development, was considered to be a stimulus of the innovation process. In the economic literature, it was mentioned that there are three types of human capital: firm-specific human capital, industry-specific human capital and individual-specific human capital. In a paper, titled 'Human Capital and Innovation', Popescu Cristian stated that the first two types of human capital refer to the abilities and knowledge valuable only within a specific firm or industry, they have a limited impact on the innovative activity within a region or state. In contrast with these two, individual-specific human capital implies knowledge that is applicable to a large range of firms and industries. Considering that individuals abilities and skills that can be improved and so they can change the way they act, human capital is seen to be an important source of competitive advantage to individuals, organizations and even to societies, having a huge capacity of innovation induction.

The focus in this paper is individual-specific human capital, i.e. one's general ability and skills in terms of education, physical condition and overall economic well-being. That is, although we believe that industry-related expertise is an important driver for local innovative activity, we take more of a macro-approach towards the effect of human capital on economic success by focusing on the societal impact of human capital measured as a combination of the overall educational attainment, economic resources and physical well-being of a country's citizens. One could argue that economic resources and physical well-being are potential outcomes rather than indicators of human capital. For instance, Maskell and Malmberg (1999) argued that some regions may be more viable and economically successful than others based on factors such as the availability of knowledge and skills. However, we will check whether and how our representation of a country's overall human capital is related to a proxy of the level of business expertise and skills relevant to innovation, i.e. the number of professionals active in R&D-related activities.

Individual-specific human capital refers to knowledge that is applicable to a broad range of firms and industries; it includes general managerial and entrepreneurial experience (Pennings et al. 1998), the level of academic education and vocational training (Hinz and Jungbauer-Gans 1999), the individuals' age, and total household income (Kilkenny et al. 1999). Prior research has shown that one's overall level of human capital has an impact on economic success, both at the business level and the macro-level. For instance, Kilkenny et al. (1999) discussed a human capital model for success and suggested that business success is positively related to one's level of training, overall business experience and total income. Also, Prais (1995) examined how a country's education and training system may foster overall productivity. For instance, this author pointed to the need to have the correct balance of educational resources devoted to general academic issues and matters directly connected to professional life, as well as

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to stimulate vocational training in order to provide future employees with job-specific technical skills.

The relationship between human capital and innovation at the country level is grounded in what Bourdieu (1986) termed as 'conversions', that is different forms of capital can be converted into resources and other forms of economic payoff. At the individual level, this conversion process has been studied and validated by a number of researchers (Becker 1964, Gradstein and Justman 2000). In general, the argument is that those who are better educated, have more extensive work experience, and invest more time, energy, and resources in honing their skills are better able to secure higher benefits for themselves, and at the same time are better able to contribute to the overall well-being of the society. For instance, Maskell and Malmberg (1999) argued that the overall stock of knowledge and skills in a society or region may enhance its overall competitiveness. Further, innovation, as a knowledge-intensive activity, is expected to be related to human capital in multiple ways. Black and Lynch (1996) proposed that investment in human capital through on-the-job training and education are the driving force behind increases in productivity and competitiveness at the organizational level. Along the same lines, Cannon (2000) argued that human capital raises overall productivity at the societal level as the human input to economic activity in terms of physical and intellectual effort increases. The overall growth in economic activity generates, then, higher needs for new processes and innovations to further support this growth.

Ewers (2007), states that the presence of skilled human capital fosters innovation and generates greater economic activity. Empirical studies confirm this, as it has been shown that the higher the investment of a society in the quality of education and the higher the educational level of a region, the higher the innovation activity output of that region (Varsakelis, 2006; Gössling and Rutten, 2007). Furthermore, for regions the negative effect of having a large, less educated population is a key factor in explaining poor innovative performance (Bilbao-Osorio and Rodríguez-Pose, 2004). Thus, some researchers have concluded that, although there is no direct causality between educated human capital and economic growth, education positively affects economic development through innovation and technological progress (Strulik, 2005). The more straightforward connection between workforce education and economic development has also been documented (Tsai, 2010).

To summarize, economic development can be achieved by individual specific human capital that has certain level of innovative capability. The presence of skilled human capital will foster innovation and generates greater economic development.

### 3. The Findings

#### 3.1 Knowledge-based Economy

The knowledge-based economy will provide Malaysia the platform to sustain a rapid rate of economic growth and enhance international competitiveness so as to achieve the objectives of Vision 2020. It will also strengthen Malaysia's capability to innovate; adapt and create indigenous technology; and design, develop and market new products, thereby providing the foundation for endogenously-driven growth. In addition, the knowledge-based economy will complement and accelerate the change from an input-driven to a productivity driven growth strategy and then innovation driven strategy. In this respect, the fuller recognition of the role of knowledge input will enhance the productive capacity of the traditional factors of production as well as generate new sources of growth. This, in turn, will expand the production possibility frontier of the Malaysian economy.

Human capital is the key driver of growth in the knowledge-based economy and will determine the competitive position of the nation. The successful development of the knowledge-based economy will, therefore, largely depend on the quality of the education and training system. The institutional framework to ensure an adequate supply of appropriately qualified and skilled manpower and to continuously retrain them, will be put in place. Vocational and technical education and training will be given greater prominence and will be refocused to produce the skills required by the knowledge-based economy. In addition, teaching methods will be transformed to promote creativity, originality, innovation as well as thinking and analytical skills. The use of IT as a tool for teaching and learning will be made more pervasive.

Concerted efforts will be taken to increase enrolment at the tertiary level, particularly for science and technical courses. Public and private tertiary institutions need to become more market-driven and proactive by moving beyond traditional areas to new fields of education required by a maturing knowledge-based economy. They will be required to enhance the standard of education and produce highly employable manpower. The quality of the teaching profession will also be improved by attracting better qualified people into the teaching profession, undertaking a programme of continuous training, and reviewing their scheme of service in terms of remuneration and promotion opportunities.

A system of life-long learning has been promoted to ensure that workers can continuously upgrade their skills and knowledge in order to remain relevant in the environment of rapidly changing technology and work processes as well as to nurture a learning society. Both the public and private sectors will be encouraged to set up the necessary infrastructure to facilitate life-long learning. In this regard, educational institutions will be required to introduce flexible learning approaches in terms of duration of course, entry requirements and mode of teaching as well as ensure affordability. Community colleges and resource centers will be set up to increase accessibility to acquire and disseminate knowledge. Firms and industries will be encouraged to provide incentives to their employees to relearn and continuously upgrade their skills. Towards

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this end, financial institutions will be encouraged to provide low interest loans to those interested in upgrading their skills.

Malaysia needs to harness its potential to drive the key sectors in Science and Technology (S&T) and R&D and become a competitive knowledge-based economy. To provide the impetus for S&T and R&D initiatives, the public sector will increase the proportion of the budget allocated for this purpose. The funding mechanism for R&D activities will be streamlined to ensure optimum utilization of funds. Proposals for research will be evaluated by a panel of experts, including foreigners, in the proposed area of research. The corporate sector, including the small-and medium-scale enterprises (SMEs), will be provided significant incentives to allocate a greater proportion of their revenue for R&D.

The knowledge-based economy will present Malaysia the way forward to achieve sustainable rapid growth and remain globally competitive in both medium and long term. In order to be a knowledge-based economy, it is essential to address the constraints and resolve them swiftly. Malaysia has to set some of the basic foundations of a knowledge-based economy and efforts has to be taken in the key areas such as human capital development, S&T and R&D, financing and equity, which are fundamental to building Malaysia in becoming knowledge-based economy.

### **3.2 Malaysia In World Competitive Yearbook**

The Institute for Management Development (IMD)World Competitiveness Yearbook 2011 ranked Malaysia at 16th position in overall performance out of 59 economies (2010:10th out of 58 economies). This places Malaysia among the top 20 countries such as Canada, Denmark, Finland, Norway, and Australia. The five most competitive economies are Hong Kong, United States, Singapore, Sweden and Switzerland. The competitiveness performance of the 59 economies is shown in Table 2.

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**Table 2:  
THE WORLD COMPETITIVENESS SCOREBOARD 2011**

COUNTRIES	2011		2010	
	RANK	INDEX	RANK	INDEX
Hong Kong	1	100.00	2	99.357
USA	1	100.00	3	99.091
Singapore	3	98.557	1	100.000
Sweden	4	94.063	6	90.893
Switzerland	5	92.588	4	96.126
Taiwan	6	92.011	8	90.441
Canada	7	90.782	7	90.459
Qatar	8	90.219	15	83.828
Australia	9	89.259	5	92.172
Germany	10	87.824	16	82.730
Luxembourg	11	86.475	11	86.867
Denmark	12	86.418	13	85.587
Norway	13	86.313	9	89.987
Netherlands	14	85.707	12	85.650
Finland	15	84.380	19	80.002
<b>Malaysia</b>	<b>16</b>	<b>84.120</b>	<b>10</b>	<b>87.228</b>
Israel	17	81.629	17	80.327
Austria	18	81.619	14	84.085
China Mainland	19	81.100	18	80.182
United Kingdom	20	80.278	22	76.808

Sources: IMD World Competitiveness Yearbook 2011

In the overall performance, Malaysia was ranked 16th out of 59 economies compared to 10th position last year. Malaysia's overall performance at 16th position is due to the perception data specifically in the Government Efficiency and Business Efficiency factors. Among 13 Asia-Pacific countries, Malaysia is ranked 5th ahead of China, New Zealand, Korea, Japan, Thailand, India and Indonesia. Malaysia maintained its 2nd position after Taiwan among 29 economies in the category of countries with GDP per capita less than USD20,000.

The performance of Malaysia over a 5-year period in the overall scoreboard and in the four factors is shown in Table 3. We will briefly discuss about Infrastructure factor.

**Table 3: Malaysia's Competitiveness Ranking**

	World Competitiveness Yearbook				
	2011 (n=59)	2010 (n=58)	2009 (n=57)	2008 (n=55)	2007 (n=55)
<b>Overall Scoreboard</b>	16	10	18	19	23
<b>Economic Performance</b>	7	8	9	8	12
<b>Government Efficiency</b>	17	9	19	19	21
<b>Business Efficiency</b>	14	4	13	14	15
<b>Infrastructure</b>	27	25	26	25	26

Sources: IMD World Competitiveness Yearbook 2011.

In the Infrastructure factor, Agensilnovasi Malaysia (AIM) has been established under the Prime Minister's Office with the aim to identify R&D projects with the potential to be commercialized. To date, 8 projects have been identified ready to be taken to the commercial world with their hidden wealth worth RM316 billion expected to be unleashed by the second quarter of 2012. The Government has also implemented the National Broadband Initiative (NBI) in 2010. The latest being the Government's announcement on the Digital Malaysia Master Plan which aims to develop an ecosystem that encourages wider ICT usage.

The IMD suggested that Malaysia should continue with the vision of achieving High Income Economy. Longterm strategies to achieve sustainable growth, solid institutions and a national culture that emphasizes innovation and the accumulation of knowledge, will augur well for Malaysia.

Therefore, this paper has discussed and highlighted that skilled human capital and innovation are truly crucial elements in driving Malaysia towards Vision 2020 to achieve high economic development. Based on the analysis and findings from above mentioned fact, this theoretical paper has covered the objectives for this study. Later, this paper will be developed into the empirical paper.

#### **4. Conclusion**

Considering the information mentioned above, we can conclude that the human capital is a strong catalyst of innovation. There is a double way relation between the capacity of innovation induction and the stock of human capital. The practice generated by innovation may imply the construction of some connections that involves a better knowledge, training and a support for the continuing preparation process. The competition generates innovation among firms but it also primes a process of human capital accumulation, at an individual level. In order to cope in the innovative environment, the employees need to make efforts in accumulation and developing their own innovative capacities.

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The conclusion has to be taken in consideration, especially because we have to identify, at a national level, which are the best ways to become competitive and to profit by the good rate of economic growth that we have. It is necessary to start a strengthening process of human capital. The process implies accumulation through learning, through education. An important role in this case plays the state, which, through its policies, can foster individual behaviors. A good financing of education and research, and a careful social policy may involve positive effects, encouraging on medium and long term.

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