



*Banco de Portugal*

EUROSISTEMA

## **Address by Governor Carlos da Silva Costa at the EPIS Master Class “The role of education in promoting a sustained economic development process”**

*“Education is the most powerful weapon which you can use to change the world.” (Nelson Mandela)*

Lisbon, 12 April 2012

### **INTRODUCTION**

Chairman of the Association of Entrepreneurs for Social Inclusion (EPIS) and members of the board,

EPIS associates, partners and members of staff,

Members of the educational community,

Ladies and gentlemen,

I would like to welcome all members of EPIS present. It is a great pleasure for Banco de Portugal, as a partner since 2011, to host this Annual General Meeting of EPIS.

On behalf of myself and Banco de Portugal, I would like to congratulate EPIS for its work since its creation in 2006, which has been of unquestionable value. Indeed in the current juncture, which presents enormous challenges for Portuguese society, an Association which defined an Action Plan for 2010-2012 called ‘Winning over the Portuguese’, and which has already achieved visible results, is cause for satisfaction, and must clearly be congratulated and supported.

After five years of existence, EPIS today is the largest private investor in Portugal in the area of education, with over €15 million already allocated to innovative programmes, covering 173 schools in 60 municipalities (around 20 per cent of the country’s territory) and working closely with around 10,000 students.

EPIS is a privileged partner of the Ministry of Solidarity and Social Security and its work is particularly relevant in economic and financial crisis situations which increase the risk of poverty and social exclusion.

Civil society must not stand back from the goal of avoiding poverty and marginalisation situations and we must all be informed and proactive about it. One way to take action is by supporting specific

projects which show clear entrepreneurship and viability. This is something that must be fostered. I believe that this is the way to create and develop true social networks, in which the various sectors of society help one another to achieve a common goal offering benefits for all stakeholders.

Allow me to use this address to share with you the importance I place on education as a determining factor not only for personal development but also for economic development itself. I consider it one of the key pillars of a sustained economic development process.

## **EDUCATION AND ECONOMIC DEVELOPMENT**

### **Evolution of economic theory on the role of education**

The neo-classical approach to economic development theory explained economic growth/development as resulting from two independent factors:

- i) An increase in capital intensity per worker (i.e. a new combination of capital and labour inputs that brought an increase in productivity per worker) and,
- ii) A technological change.

According to one of the assumptions underlying this theory, the labour productivity for a given technology depended on the relative quantity of labour and capital inputs but not on their qualitative nature, namely with regard to education and professional training.

However, the evidence of various studies shows that there is a consistent relationship over time between economic growth/development in a given country/region and the rate of innovation and adoption/diffusion of those innovations.

That same evidence also shows that there is a consistent relationship on the one hand between companies' innovative capabilities in a given country/region and on the other hand the workers' skills/qualifications and the companies' organisational models and strategies.

In turn, technological developments are not independent of the quantity and quality of human resources. The evidence suggests that not only do technological innovations determine economic growth/development, but also the volume and nature of employment in a country or region.

The inability of the neo-classical model to account for the factors behind the economic growth/development process, namely the central role of the production and accumulation of technological innovation knowledge, led to the emergence of a new paradigm.

A new economic theory approach gave a key role to knowledge in the innovation process sustaining economic development.

In the early 1970s, Ernst Schumacher claimed in his book 'Small is Beautiful' that 'development does not start with goods, it starts with people and their education, organisation and discipline. Without these three, all resources remain latent, untapped, potential'.

In fact, the pace and degree of economic development in a country or region are the result of the interaction between a complex set of factors which include education on the one hand (including

professional training and technological research and development – R&D) and on the other the behaviours and values of economic agents and the society they are in, i.e. the organisation and discipline mentioned by Schumacher.

The relative importance of these determining factors depends on the country and time in which they take place. It depends on the developmental stage of the economy in that country/region and on the phase of the scientific-technological cycle, in Schumpeter's use of the term. Following the breaking of scientific or technological paradigms, a developed country's capacity for radical innovation determines its place in terms of international trade specialisation.

Thus, the education level, i.e. the number of years of schooling, explains the place that less developed countries have in terms of intersectoral specialisation. Empirical evidence shows that productivity, value added per asset and foreign trade composition are correlated with the percentage of students passing from primary and lower secondary education level to higher secondary education level. Similarly, 'education methods' distinguish developed countries. Greater productivity levels and/or high quality products are associated with countries whose professional training systems are based on a close liaison between formal education and professional training within companies themselves, as well as close cooperation between companies and their staff, through their respective representative organisations – the so-called 'dual professional education systems' (as is the case in Germany, Switzerland and Austria for example). These countries tend to have a greater comparative advantage and a greater specialisation index in high-end products, while the other developed countries tend to specialise in low-end products.

At the same time, the new approach resulted in a radical reorientation of socioeconomic policies towards, on the one hand, promoting knowledge creation and innovation and, on the other hand, optimising the operation and interlinking of the education, professional training and R&D subsystems.

In the new context of globalisation and the information society, one should ask whether this paradigm is still valid. The new information and communication technologies and globalisation have led to accelerated erosion of the advantages arising from controlling available information and knowledge, with important implications for the dynamics of production systems and societies.

This generalisation of access to information and knowledge, in a context of globalisation of markets and production activities, contributes to a global economic transparency, by emphasising alternative locations' cost advantages and other benefits. This brings important social implications:

- i) Firstly, a shortened period for innovators to obtain higher margins, the appearance of new production centres, a shortened period of controlled access to new knowledge and a shortened life cycle of products have reduced the monopoly period over the information, jeopardising the existing competitive advantages
- ii) Secondly, the erosion of advantages arising from initial education and training, i.e. obtained before joining the workforce. Thus, access to predetermined professional careers is less certain and a given wage level or social position is not guaranteed. Placements no longer depend only on the number of years of education, careers are no longer determined only by the education received and wages may be very different for individuals holding identical qualifications.

Does this mean that globalisation and the new information and communication technologies will cancel the influence of national innovation systems' type, orientation and operation, diluting them into a kind of transnational system? I do not believe so. The benefits are no longer distributed equally among all the countries and regions and will tend to accentuate the knowledge accumulation asymmetry both between countries and between regions:

Firstly, the likelihood of success in producing and absorbing new knowledge effectively depends on the location of the economic agents and companies. The externalities inherent to the national innovation systems' dynamics compensate and neutralise the effects of a widespread dissemination of information and knowledge.

Secondly, different countries' and regions' ability to take advantage of the access to information and knowledge is limited by differences in the local ability to use those technologies or transform the codified knowledge. It depends on tacit knowledge and other skill elements that by definition are difficult to transfer, imposing a new set of requirements for individuals, organisations and networks. What counts now is not only the knowledge or information available, but also, and above all, the capacity to learn.

Workers with new skills must be available: greater education, greater qualifications and greater capacity for adapting to new requirements arising from the new technologies. The ability to access the networks and the skill to take the relevant information from them and to use it in economic terms are the critical factors for workers' performance and remuneration levels (and, as a consequence, income distribution).

This means that without professional training and without renewing/reformulating organisations, the introduction of new technologies may result in enormous efficiency losses. The recent use of the concept of 'knowledge economy' constitutes a way of recognising that knowledge and individuals', companies' and national systems' capacity to learn are key factors/resources for economic development.

Finally, the potential for recovering the technological lag of a given country does not vary in direct proportion to the initial lag behind the technological leaders. The postulate which states that countries which are more delayed in terms of technology benefit from the advantage of that very delay because they have the chance to assimilate the knowledge developed by the leaders, is a postulate that does not prove true unconditionally.

In fact, countries' intrinsic capacity to absorb the effects of new knowledge effectively depends, among other factors, on the existence of a human capital stock with technical qualifications and social skills, mechanisms that mobilise, coordinate, integrate different kinds of knowledge and the different producers of knowledge, like companies, research institutions and universities. Knowledge is not automatically disseminated and often is not codified (it is implicit and specific to organisational performance), due to which communication and interaction mechanisms are needed: cooperation, strategic alliances, clusters and networks.

In sum, despite globalisation and generalised access to information introduced by the technological revolution, innovation systems are going to retain their national or regional specificity and thus will continue to determine the growth possibilities of different geographical areas or institutional

entities. The intensification of global competition has increased the importance of local and national conditions even further.

### **The role of education in sustained economic development**

At least as important as investing in an economic development process is ensuring the sustainability of that process. There are four conditions needed to ensure sustained economic development. And all four have to be present at the same time:

- i) Increased gross value added (GVA) per worker (by increasing productivity and/or creating value by differentiating the supply)
- ii) Job creation (reduction of unemployment)
- iii) Sustainability of external accounts
- iv) Sustainability of public finances

The economic development process is unstable by nature, given that economies have their own dynamic. They are constantly threatened by various factors – new competitors, new demand patterns, new outcomes from the technological research and development process –which is why they must always be able to respond to new situations. Increasing productivity is typically the most immediate response, but new products and new value propositions have to be studied continuously. This whole process is no more than the so-called innovation process.

This dynamic requires companies to adapt permanently. However, identifying the problems to address, then introducing technological developments that resolve them, and, in particular, transposing those solutions to the production sphere, depend on factors that the economic agents and companies on their own do not control, such as for example:

- i) The quantity, quality and organisation of human capital in the country or region where they are located
- ii) The regulation framework of the country/region's labour market
- iii) The type or intensity of the dialogue the company establishes with the customers and suppliers, public administration, universities, unions, companies of the same sector, whether domestic or foreign direct investment companies, and the financial sector
- iv) The prevalent social values and behaviours system

Innovation has both a technological and a non-technological dimension, i.e. of an institutional, educational and social nature, which characterise the so-called national/regional innovation systems. In the non-technological dimension, structural factors may be identified such as values, attitudes and behaviours, as well as others with a more changeable nature, like national or European public policies.

The national innovation systems' differences in orientation and effectiveness influence and determine not only the performance of the national or regional production systems but also the economic development model itself.

How are the national innovation systems distinct? What differentiates them in terms of effect on economic development and employment?

In this regard one must distinguish between two standard models of innovation system:

- Models oriented towards radical innovation, i.e. models that enable new products to be introduced and new markets and sectors to emerge, reflecting breakthrough knowledge and technologies
- Models oriented towards incremental innovation, i.e. models that enable new production processes to be introduced and quality improvements to products already in production or established in the market

In reality, the different national or regional innovation systems are combinations, to varying extents, of these two kinds of standard model (radical innovation and incremental innovation) and reflect the presence and the effect of factors that, by their structural nature, have high inertia.

For example, what differentiates the European economies from the American is the nature, goals and interlinking of three subsystems of the respective national innovation systems: the education subsystem, the professional training subsystem and the R&D subsystem.

The European Union economies have a greater tendency toward continuous improvement of production processes and quality of products that are already well-known and established in the market, and a lower ability to introduce radical innovations, reflecting the effects of an institutional context – mainland Europe – which favours continuous improvement in educating workers and stability of work relations, and discourages breakthrough knowledge and technologies and exploration of ideas and radically new discoveries.

In turn, what differentiates the European economies from one another is no longer the nature, goals and interlinking of those subsystems – which we can call ‘innovation system orientation’ – but the effectiveness of their respective operation in pursuit of those goals.

That is to say, the closer matching of education and professional training to companies’ needs in the more developed European countries explains the greater quality and efficiency in their production, and as a result, their comparative advantage in the incremental quality of already well-known products. However, the values, attitudes, nature and interlinking of the university, research and corporate subsystems explain the comparative disadvantage of the more developed European countries in regard to radical innovations in producing goods and services.

In terms of companies, absorbing new knowledge or technologies depends, aside from their immediate context, on the conditions in place within each one of them, particularly on the factors governing learning and their working methods, namely:

- i) The strategic guidelines
- ii) The skills of workers and their ability to track production of knowledge external to the company
- iii) The nature of the companies’ internal organisation and their compatibility with the appropriation and application of new knowledge and requirements of a new technology
- iv) The technological development leading to new organisational types, and in particular specific organisational skills for solving problems related to the transposition and application of production technologies. The transposition of production processes across different organisations and technological traditions always comes up against learning

difficulties inherent to their specific corporate and organisational environment. Certain kinds of corporate organisation have a greater capacity and response speed to new challenges arising from their environment, and thus are more competitive

- v) The management model – namely, the labour relations within the company – and the incentives structure for the company’s members of staff, factors that govern learning and the mobility of workers and the company’s working methods

In the new context of globalisation, the role of the State also changes: Governments lose manoeuvring space due to the loss of effectiveness of the policy instruments based on controlling international flows. But they continue to be influential players in three aspects: education, professional training and service networks needed for markets to operate and for production (transport, communications, distribution, financial services).

This means that public policies must be structured according to the need to enable local innovation capacities and promote the local capacity to learn about what is being done in other countries, a necessary condition for improving the specialisation pattern. It is vital to set the agenda for innovation. “What education?”, “What research?” and “What professional training?” are three questions that need complete answers, with a common purpose and ensuring efficiency in implementation. Empirical evidence shows that the greater the dispersion of factors of innovation, the greater the loss of efficiency in the national innovation system.

It is also important to remember that the effectiveness of development promotion policies depends on the diagnosis of the initial situation and the feasibility of the goals or guidelines established for the national or regional innovation system.

### **The Portuguese economy**

In the case of the Portuguese economy, it still has a share of intersectoral specialisation concentrated in the medium and medium/low end, reflecting the insufficiency of schooling, in number of years and content, above all in the past, and the mismatch between education and professional training.

In more advanced development stages, the specialisation model is already intra-sectoral, i.e. concentrated in higher-end production. Typically, the development process moves from vertical intra-sectoral specialisation (medium-end, differentiating product quality) to horizontal intra-sectoral specialisation, determined by the different demand patterns and focusing on the high end.

The Portuguese economy’s specialisation pattern requires the strengthening of the national innovation system’s orientation towards improvement of the positioning of the production system in the context of intra-sectoral specialisation. This means that the national system must be oriented towards incremental innovation and public development policy must aim to strengthen the education, professional training and research subsystems.

The education and professional training system must be developed at various levels:

- i) Increasing the average educational attainment level – the percentage of workers with a level equivalent to 12<sup>th</sup> year is still low; increasing compulsory education to 12<sup>th</sup> year was

- an important step, but it must be effective (also at vocational level), since school failure and dropout rates are also too high
- ii) Revising the curricula to anticipate the evolution of companies' demand, and to qualify students for a permanent learning process, in particular decodifying knowledge and sharing of tacit knowledge. On this point, work must be done in particular on interlinking education and professional training, investing more strongly in a dual professional training system, involving companies' active participation in designing and financing professional training
  - iii) Adapting the education system to local/specific economic and social situations, allowing inclusion and at the same time differentiation (in the sense of temporary distinction)
  - iv) Opening the education system to permanent recycling of the active population, through adjustment of teaching practices and concepts

It is vital to recognise that schools are the key actors in the educational mission, but they have to be assisted by the State and also by the various sectors of civil society. The companies as key receivers of qualified workers must intensify the interlinking of the education system and professional training, setting out their needs in terms of knowledge and skills. Awareness should be raised among citizens - who form the basis for development - regarding the importance of educational action, so that they are proactive and contribute in a committed way to its success. The family itself must promote access to education as a 'social elevator', but this does not always happen.

On this front, I would like to recall some of the conclusions of a study published by Banco de Portugal around a year ago on educational attainment and equality of opportunity in Portugal and Europe.<sup>1</sup> By analysing the level and variability of educational performance in Portugal and European Union countries using the PISA 2006 database, the study concluded that in Portugal, as was the case for the groups of reference countries, the socioeconomic variables are the main determinants of attainment, with a much less important contribution made by resource variables (except for the hours of regular lessons).

Portuguese students consistently come in the lower half of the performance ranking in the group of countries considered, both in mathematics and reading. These results are partly explained by a disadvantaged situation in terms of household background, namely as far as parental education and occupations are concerned.

These results reveal the importance of social inclusion promotion initiatives – aimed at young people in more deprived situations or at risk of marginalisation – for driving the development of these young people both for the individuals and for the economic development itself.

The decisions on education and training must be seen as human capital investment decisions, and as in any investment decision, one must consider costs and benefits. The costs of education are typically shared between the individual, the families and the State. The individual and social benefits of education are measured through success in the labour market, in the form of higher salaries and more employment opportunities, aside from the individual's personal and social development.

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<sup>1</sup> Pereira, M. C., 'Educational attainment and equality of opportunity in Portugal and in Europe: the role of school versus parental influence', Economic Bulletin of Banco de Portugal, Winter 2010.



In Portugal empirical evidence suggests that the return on the investment is also high, because the relative weight in the labour market of individuals with higher education is still low.<sup>2</sup> This return is considerably higher for individuals with longer careers than for new graduates, suggesting a diminishing trend in this wage difference.

The segmentation characterising the Portuguese labour market, with a very high relative importance placed on fixed-term contracts, does not encourage companies nor individuals to invest in training. Reform of the labour market to promote single contracts would also be an enabling factor in training throughout active life.

The research and development subsystem should also be made more effective, by:

- i) Increasing horizontal and vertical integration, to create a true innovation system
- ii) Moving from a disparate system with low critical mass to establishing strategic mergers and alliances between associated entities and/or laboratories
- iii) Creating capacity for absorbing knowledge at company level (across all hierarchies, from top to bottom)
- iv) Reformulating the financing system behind research, always requiring compensation or an incentive to promote results and boost private investment

## **FINAL NOTES**

I would like to conclude my speech by summarising four ideas that seem crucial to me.

The first is that sustained economic development determines implicit demand for entrepreneurship in a given country or region. The nature and intensity of that demand for entrepreneurship varies in time and space according to the developmental stage of the country or region in question and the long economic cycle.

The second key idea is that the national or regional supply of entrepreneurship is determined by the accumulation of knowledge: access to the relevant information and processing capacity in economically relevant terms. This accumulation of knowledge is also unequally distributed across countries and regions, and is basically determined by the national institutions, and in particular by the interlinking, orientation and effectiveness of national innovation systems.

The third aspect I'd like to stress is that, despite globalisation and generalised access to information, the innovation systems are going to retain their national/regional identity/specificity, and thus will continue to determine the growth possibilities of different geographical areas or institutional entities. The intensification of global competition has further increased the importance of local and national conditions.

And finally, the fourth key idea is that it is crucial for the development process of the three pillars that are essential for knowledge – education, professional training and research – that society is proactive at all levels. State, local communities, companies and citizens must act in an integrated and efficient way.

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<sup>2</sup> See for example Alves, Centeno and Novo, 'Investment in education in Portugal: returns and heterogeneity', Economic Bulletin of Banco de Portugal, Spring 2010

The State and local communities must come together to strengthen those three subsystems – education, professional training and research – through public policies, institutions and infrastructures. Companies must identify their needs in terms of their human resources' qualifications, organising themselves so that staff adapt continuously to new situations, and in combination with citizens, the so-called 'civil society' must take an active part in the educational mission and in promoting knowledge.

I finish with a quote from Nelson Mandela:

“Education is the most powerful weapon which you can use to change the world.”

And I add, knowing how to use it is the critical success factor.

Thank you very much.