

Opinion of the European Economic and Social Committee on the structural and conceptual change as a prerequisite for a globally competitive knowledge and research-based European industrial construct (Europe: Catching up or taking the lead?)

(2009/C 100/11)

On 17 January 2008, the European Economic and Social Committee, acting under Article 29(2) of its Rules of Procedure, decided to draw up an own-initiative opinion on

Structural and conceptual change as a prerequisite for a globally competitive knowledge and research-based European industrial construct (Europe: Catching up or taking the lead?).

The Consultative Commission on Industrial Change, which was responsible for preparing the Committee's work on the subject, adopted its opinion on 10 September 2008. The rapporteur was Mr TÓTH and the co-rapporteur was Mr LEO.

At its 448th plenary session, held on 22 and 23 October (meeting of 22 October), the European Economic and Social Committee adopted the following opinion by 98 votes to none, with one abstention.

1. Conclusions and recommendations

1.1. Climate change, demographic changes, globalisation, and commodity and energy scarcity will lead to far-reaching economic and social changes in Europe. The impact on living standards and competitiveness in Europe depends largely on whether the right measures are taken in good time. The need to find innovative responses to new challenges stems from the success of the European catch-up process in many areas. Although arriving at the 'technological frontier' makes independent innovation the most important driver of growth, there is a need for changes in areas which for a long time were viewed as factors underpinning this success (e.g. in education and training). Promoting cohesion within the community is an equally valid goal. The need to adapt will put the European social model to the test and the outcome will determine the living standards of current and future generations. Social dialogue and civil society dialogue with all relevant stakeholders will take on an important, influential role in overcoming these challenges.

1.2. In any case, the scope for adjustment should be increased and the pace of change stepped up if the challenges ahead are to be overcome and Europe's additional growth potential is to be developed. The Lisbon Strategy⁽¹⁾ has set goals which broadly chime with this point of view and are important to Europe. At the same time, the scope of the changes needed has often been unclear and the translation of legislation into economic policy strategies too hesitant. The impact of this approach is well-known and there is now a need for fresh efforts in order to pursue these goals with renewed vigour. A sustained increase in resources for the implementation of the Lisbon Strategy is therefore proposed.

1.3. At the same time, it is clear that there can be no one-size-fits-all strategy and that in some policy areas each Member State

must implement European guidelines using a specific package of measures adapted to national circumstances if policy is to be effective. However, measures at European level and those in Member States must complement each other and it goes without saying that the same requirements also apply to measures taken at European level. As regards horizontal policy areas — i.e. matters that come under the remit of different directorates-general — any strategy must also be implemented using a coordinated approach. In both cases, this complementarity will result from clear cooperation and coordination of policy strategies and measures drawn up and implemented jointly.

1.4. At present, cooperation and coordination are frequently promised but in practice are implemented only half-heartedly. There must be changes here if the positive effects of coordinated implementation are to be maximised⁽²⁾. Increased cooperation among Member States in devising and implementing measures can also increase effectiveness. In order to support this process, a share of the additional resources should be put aside specifically for the development of cooperation programmes between the European Union and Member States. Access to these resources should only be possible when measures taken are clearly in keeping with one another and serve to achieve common goals.

1.5. Europe is thus faced with a challenge primarily because only a few Member States have laid the foundations for cutting-edge work. Many Member States have still not managed the transition from catch-up phase to cutting-edge production. The transition to a knowledge-based economy leads to increased demand for highly qualified workers. In order to deal with this situation, there is a need for medium to long-term forecasts of the skills required of workers. This will

⁽¹⁾ Of course, the Lisbon Strategy is much broader than the issues raised here. For more details see: http://ec.europa.eu/growthandjobs/index_en.htm

⁽²⁾ Policy coordination will stimulate production of public goods (e.g. information and knowledge, environmental and climate protection) and creation of positive external effects. Increasing economic integration in Europe creates externalities and only through policy coordination can positive externality be increased and negative externality decreased.

form the basis for the restructuring of the education and training sector.

1.6. In order to solve outstanding problems and boost economic efficiency, structures in science and research should be put in place to promote excellence. Sustained efforts are also required here in order both to improve research output and teaching and to catch up with the international frontrunners across the board. Following the relaunch of the Lisbon Strategy, certain conditions were put in place at European level to make it possible to pursue this approach. The European Research Council and the European Institute of Innovation and Technology will accelerate this process of change. Investment in these structures must be further stepped up in future as an incentive for Member States to pursue complementary strategies. Furthermore, it is necessary to further encourage close cooperation between businesses on the one hand and academic, university and research communities on the other, and to support the auxiliary service infrastructure, such as science, innovation, technology and industry parks.

1.7. Alongside investment in workers and scientific systems, there is a need for Member States, in their efforts to promote research, to offer much stronger support to risky innovation projects, better protection of property rights (e.g. European patent and measures against product piracy), innovation-friendly regulation of the product and labour markets, risk-appropriate funding possibilities, measures to boost demand for innovation (e.g. internal market, public procurement, lead markets), more mobility at all levels and an appropriate competition and macro-policy. Successful implementation of these policy measures will increase innovation significantly and thus lead to higher R&D spending.

1.8. Finally, there is a question of creating a system that offers a flexible and swift response to the challenges ahead. This approach is underpinned by the conviction that the future costs of inaction today are considerably higher than those of the measures to be taken. This actually applies to a large extent — but not exclusively — to environmental measures. It is in this area that Europe has in the past played a leading role which should be expanded through consistent development of the adopted strategy. This will safeguard industrial policy (first-mover-advantage), social and environmental dividends which can stem from measures to protect the environment involving harmonised environmental regulation, standardisation, promotion of innovation in environmental technology and support for social innovation.

1.9. However, this kind of forward-looking strategy must also have public support if it is to be implemented successfully. If the need for change is not clear and the benefits not obvious or shared out unequally, then there will be little appetite to make changes in society and to individual lives. Civil society institutions are key to the design and communication of this strategy. It goes without saying that if the public is to accept

this strategy and the measures adopted it must have a say over their design. Widespread involvement and discussions at the preliminary stage increase the likelihood of a joint initiative. Although this is almost too late for the discussions on the next stage of the Lisbon Strategy, there should still be an attempt to involve a broad spectrum of stakeholders.

2. Background

2.1. Over the past 50 years, Europe's economic output has steadily improved, thus closing the gap of the 19th and first half of the 20th centuries ⁽¹⁾. Europe has almost caught up with the USA in terms of hourly productivity, although output per head has stalled at almost 70 % of the US rate (see Gordon 2007). However, the catch-up process was unexpectedly interrupted in 1995 and there followed a period in which the USA grew more strongly than Europe. The main reason for the acceleration of US output is seen as its ability to integrate new technologies — in this case information and communication technologies — more rapidly. The USA reacted more quickly than most European countries, both in terms of developing and disseminating these technologies.

2.2. The varying speeds with which new technologies have been developed and integrated are not specific to information and communication technologies, but are the consequence of the established economic policy system. The USA is a leader in many new technologies and benefits from a strongly market-oriented system with some of the world's top universities and research institutes, highly skilled workers from all over the world, a high level of risk-taking, rapid growth of newly established businesses, and a homogeneous internal market.

2.3. European countries, on the other hand, have created structures and put in place economic policy measures to support the catch-up process and enable technologies to be adopted rapidly. High investment rates have been and still are an obvious sign of this approach, as are education systems more strongly geared towards jobs, but these factors have to be set against risk-averse structures for financing innovation, low investment in tertiary education and often insufficiently aggressive development of products and technologies.

2.4. The weak European growth (see, for example, Breuss, 2008) of recent years suggests that in many areas the growth potential of the catch-up strategy has been largely exhausted. However, the transition from catch-up strategy to frontrunner

⁽¹⁾ Overall, the EU has successfully maintained its leading position in world trade, both in the goods and services sector. The European economy is the market leader in a broad section of industries with an average level of technology and in capital-intensive goods. A cause for concern is the growing trade deficit with Asia and, compared with the USA, the EU's rather weak performance in the area of ICT (see CCMI 043).

status requires far-reaching changes, which in Europe are still in the early stages and in many respects have been implemented only half-heartedly. With increasing proximity to the technological cutting-edge, independent and radical innovation measures (i.e. market innovations) are becoming the main source of growth. In order to support this trend, sectors previously classified as factors in the success of the catch-up process (e.g. education and training, product and labour market regulation, macro-economic management) must be restructured. However, the need for change in Europe stems from the present-day challenges of climate change, globalisation, demographic change and scarcity of energy and raw materials. It is important to develop structures which can react quickly to these new challenges and produce publicly acceptable, environmentally-friendly and competitive solutions.

2.5. Finally, there is a question of creating a system that offers a flexible and swift response to the challenges ahead. This approach is underpinned by the conviction that the future costs of inaction today are considerably higher than those of the measures to be taken. This actually applies to a large extent — but not exclusively — to environmental measures. It is in this area that Europe has in the past played a leading role which should be expanded through consistent development of the adopted strategy. This will safeguard the industrial policy (first-mover-advantage), social and environmental dividends which can stem from measures to protect the environment involving harmonised environmental regulation, standardisation, promotion of innovation in environmental technology and support for social innovation.

2.6. The following observations focus on those areas of the Lisbon Strategy concerned with innovation. The possibilities

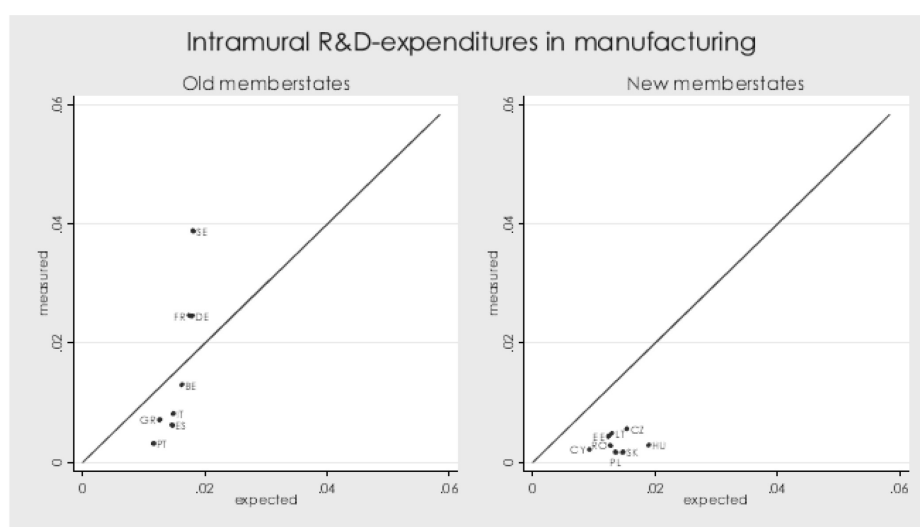
of formulating effective policy against a heterogeneous European backdrop will be discussed.

3. Europe's response to the weak growth of the 1990s: the Lisbon Strategy

3.1. Europe's response to the growing gap between itself and the USA in terms of productivity and economic growth was the Lisbon Strategy, which since its relaunch in 2005 has sought among other things to raise R&D spending to 3 % of GDP and to increase the employment rate to 70 % of people of working age.

3.2. The desired increase in R&D spending is based on many economic studies which show a clear and positive correlation between economic growth and R&D spending. When setting this goal too little consideration was given to the fact that the level of R&D spending depends fundamentally on sectoral structure and can be assessed only with reference to the way in which an industry is organised. Recent studies (Leo — Reinster — Unterlass, 2007, Van Pottelsberghe, 2008) show that the R&D spending of most 'old' Member States is near to what would be expected given their sectoral structure, whereas the R&D spending of most 'new' Member States is lower than expected (i.e. below the 45° line, see Figure 1). Sweden and Finland (and the USA too) spend considerably more on R&D than would be expected given their sectoral structure. On the one hand, this stems from the fact that these countries are working at the technological cutting-edge in some areas, place a stronger emphasis on innovation than their competitors and — in the case of the USA — produce for a large internal market. On the other hand, a research-intensive higher education sector may also boost R&D spending (see Van Pottelsberghe, 2008).

Figure 1: Structurally adjusted R&D spending



Source: New-Cronos; Fourth Community Innovation Survey (CIS-4); Countries included: Belgium (BE), Bulgaria (BG), Cyprus (CY), Czech Republic (CZ), Estonia (EE), Finland (FI), France (FR), Germany (DE), Greece (GR), Hungary (HU), Iceland (IC), Italy (IT), Latvia (LV), Lithuania (LT), Norway (NO), Poland (PL), Portugal (PT), Romania (RO), Slovakia (SK), Slovenia (SL), Spain (ES), Sweden (SE). Where available we have included the data for Iceland and Norway. New member states are the countries that have joined the EU since 2004; old memberstates are the countries that were members of the EU prior to 2004.

3.3. If R&D spending by the European business sector (at least in the old Member States) is broadly in line with sectoral structure, there is no compelling reason for a significant change in R&D spending because this must be seen as a cost factor and yields diminishing returns. Higher investment in R&D spending makes sense when drawing close to the 'technological frontier' or when there is structural change ⁽¹⁾ to develop research-intensive industries ⁽²⁾. Both changes are essential if Europe is to remain competitive and the 'European model' is to be preserved.

3.4. However, this will not be achieved so much through a one-off increase in R&D funding as through increased support for risky innovation strategies, investment in research infrastructure and improvements to education and training. Other necessary changes include creating a market environment that is conducive to innovation and more mobility at all levels (see Aho et al. 2006). Complementary measures concerning regulation of the labour market and the financing system, and competition and macro-policy are also essential. Successful implementation of these policy measures will increase innovation significantly and thus lead to higher R&D spending.

3.5. The shift in the focus of economic policy away from R&D to innovation also reduces the implicit preference for high-tech industries, which stems from the attempt to increase R&D spending. This involves the upgrading of sectors which, although high-tech in terms of use of technologies, do not invest heavily in R&D because their innovation measures are based on the intelligent use of technology and human creativity. The creative industries, the steel industry and the textile and clothing industry, for example, come up with numerous technologically ambitious innovations without or with little R&D spending of their own. It has also become apparent that in virtually all sectors there is potential for fast-growing small and medium-sized enterprises (so-called gazelles) (see Hölzl — Friesenbichler, 2008), which suggests that innovation should be broadly promoted. The focus on high-tech sectors (this ensures that they will remain highly relevant in future too) is based on demand for them growing strongly. Should there be success in bringing about innovation through R&D measures, then the benefits — in terms of economic growth and job creation — may be disproportionately high as a result of the strong growth in demand (Falk — Unterlass, 2006).

3.6. The new and old challenges require excellence both in research and implementation. Only through excellence in

basic and applied research can Europe remain competitive in light of the global challenges it faces. The area of human capital currently poses some major obstacles to the pursuit of this strategy and these obstacles will become far more pronounced in future. A larger number of better educated workers with secondary and tertiary education is the key to structural change and closing the technological gap. The failings to date can only be made good over a long period and in many ways are still not being pursued with sufficient vigour. At the same time, there must be an effort to ensure that, in terms of educational structures, the supply of training places matches demand ⁽³⁾ and that continuing education (keyword: lifelong learning) receives just as much attention so that workers at all stages maintain their productivity and employability.

3.7. The revamped Lisbon Strategy brought about some major changes at European level to hasten structural change and the development of research-intensive economic structures and excellence. These changes include measures to improve availability of risk capital and mobility of researchers, the European Institute of Innovation and Technology, the European Research Council and the lead market initiative. Furthermore, there has been an increase in funding for the framework programmes and an expansion of lead projects at European level.

4. Europe: effective policy in spite of diversity?

4.1. Even if the European objectives are largely clear and shared by all, this raises the question of whether Europe is at all capable of formulating a policy in this area given its diversity. European diversity is reflected not least in the varying levels of productivity in Member States, mixed successes and the technology front (e.g. GSM standard vs. ICT-use), and major differences at sectoral level both between sectors and within sectors (see Falk, 2007, Leo — Reinstaller — Unterlass, 2007, see Appendix 3).

4.2. This diversity poses a major challenge for economic policy because economic policy measures yield different results depending on the level of economic development. Successful countries adapt their economic policy strategies explicitly or implicitly to their respective levels of economic growth, thus

⁽¹⁾ Structural change is based on start-ups, diversification of existing businesses or establishment of new ones.

⁽²⁾ 'Research-intensive' sectors are specifically mentioned here because categorisation into high, medium, and low-tech sectors on the basis of R&D spending underestimates the use of technology in many economic areas. If the incorporation into products and manufacturing processes of technologies developed elsewhere is included, then many industries that are traditionally classified as low-tech would instead be placed in the medium or high-tech sectors (see Peneder, 2007).

⁽³⁾ Cedefop believes that 'Total employment in Europe is projected to grow by more than 13 million jobs between 2006 and 2015. This comprises increases of almost 12,5 million jobs at the highest qualification level (roughly ISCED levels 5 and 6) and almost 9,5 million jobs at medium level (ISCED level 3 and 4). On the other hand, there is a decline of over 8,5 million jobs for those with no or few formal qualifications (ISCED levels 0-2). Source: Cedefop, Future skill needs in Europe, Medium-term forecast, 2008.'

attempting either to support a catch-up process or to gear themselves towards production at the technological cutting edge. The rationality of adapting economic policy to levels of development has been underlined by a number of academic studies. These show that the same measures produce different results depending on a country's level of development. For example, a measure which can yield rich rewards in a country producing cutting-edge technology may have a smaller or even a negative impact on economic growth in a country playing catch-up.

4.3. This point is well illustrated using the example of the education system⁽¹⁾. In order to maximise the return on investment in the education system, attention needs to be paid to causal relationships, which vary depending on a country's level of development: tertiary education becomes more important the closer a country is to the technological cutting edge. Vocationally-orientated education systems, on the other hand, help countries playing catch-up. Aghion et al. (2005) estimate that increasing spending on higher education by USD 1 000 per person in a country at the technological cutting edge boosts the annual growth rate by some 0,27 percentage points, whereas investing this amount in a country that is lagging behind in this area increases the growth rate by only 0,1 percentage points. Employing people with higher education in countries close to the technological cutting edge can yield a higher return, because these countries are also seeking more radical innovation, which can only be achieved through scientific research.

4.4. At the same time, a higher level of education leads to more flexibility in the choice of technology. Some 60 % of the difference in growth between European countries and the USA can be attributed to the fact that European education systems are strongly geared towards vocational or secondary education (Krueger — Kumar, 2004). Knowledge-based societies need general key skills and higher education, which promotes the adaptation of new technologies and the creation of new sectors with new businesses. The historic — and, as far as the catch-up process is concerned, correct — European focus on secondary education is therefore becoming an obstacle to growth given Europe's arrival at the 'technological frontier'.

4.5. It goes without saying that when drawing up and implementing economic policy the European Union is faced with a heterogeneous association of countries. If there are many differences then implementation is usually delegated to Member States so that they can find solutions adapted to local circumstances⁽²⁾. However, it is essential that implementation of common policies between the various levels is synchronised and coordinated so that a chosen strategy can be implemented in full. This point is underlined by the

existence of interdependencies within the European Union. The progress of some Member States also benefits others and copycat strategies are not acceptable behaviour.

4.6. It is clear that there can be no 'one size fits all' strategy; only a package of measures tailored to each country can be successful. However, it is important to note that when a country reaches the 'technological frontier' it must change its economic policy structures and strategies, because at that point existing tools — often developed over a number of years — cease to have a positive impact on growth (if they do, this impact is only very limited) and thus become at least partially ineffective. The same is true — although under different circumstances — for countries playing catch-up. Employing the same strategies as countries at the technological cutting edge would also be an ineffective solution. Any European strategy must therefore offer solutions on how to:

- increase both cohesion and excellence and thus take account of the level of economic development,
- draw up goals and measures which take account of the cross-cutting nature of many policy areas (e.g. environment, innovation) and which can be implemented effectively despite the need for coordination across these areas,
- establish a division of work between the European Union and Member States that takes account of the actual circumstances, and
- make adopted measures binding and impose sanctions for any deviations from these measures.

4.7. The structures and mechanisms for a policy of this kind are widely available in Europe and must 'only' be used in the appropriate form and with the appropriate content. With regard to the latter, the key parameters are well-known and have long been the subject of discussion. What is lacking is the political clout to make an impact on the real economy and European companies.

5. Literature used

Acemoglu, D. Aghion, P., Zilibotti, F, *Appropriate Institutions for Economic Growth*, 2006.

Aghion, P., *A Primer on Innovation and Growth*, Bruegel Policy Brief 02, 2006.

⁽¹⁾ In principle, investment in human capital yields very high returns. Increasing the average period of education by one year boosts potential economic output by 6 % over the long term (De la Fuente, 2003).

⁽²⁾ Although a review of the division of skills should take place regularly, any discussion here would go beyond the scope of this opinion (see Falk — Hölzl — Leo, 2007).

- Aghion, P., Bloom, N., Blundell, R., Griffith, R., Howitt, P., Competition and Innovation: An Inverted-U Relationship, *Quarterly Journal of Economics*, Vol. 120, No 2, pp. 701-728, 2005.
- Aghion, P., Blundell, R., Griffith, R., Howitt, P., Prantl, S., The Effects of Entry on Incumbent Innovation and Productivity, NBER Working Paper 12027, 2006.
- Aghion, P., Boustan, L., Hoxby, C., Vandenbussche, J., Exploiting States Mistakes to Identify the Causal Impact of Higher Education on Growth, Working Paper, Harvard University, 2005.
- Aghion, P., Fally, T., Scarpetta, S., Credit Constraints as a Barrier to the Entry and Post-Entry Growth of Firms: Lessons from Firm-Level Cross Country Panel Data, 2006.
- Aghion, P., Marinescu, I., Cyclical Budgetary policy and Economic Growth: What Do We Learn from OECD Panel Data?, 2006.
- Aho, E., (Chairman), Cornu, J., Georghiou, L., Subirá, A., Ein innovatives Europa schaffen, Bericht der unabhängigen Sachverständigengruppe für FuE und Innovation, eingesetzt im Anschluss an das Gipfeltreffen in Hampton Court, 2006.
- Breuss, F., Die Zukunft Europas, in: BMWA, Das österreichische Außenhandelsleitbild — Globalisierung gestalten — Erfolg durch Offenheit und Innovation, Wien, 2008.
- Cedefop, Future skill needs in Europe, Medium-term forecast, 2008.
- De la Fuente, A., Das Humankapital in der Wissensbasierten globalen Wirtschaft, Teil II: Bewertung auf der Länderebene, Abschlussbericht für die EU-Kommission Beschäftigung und Soziales, 2003.
- Falk, M. Sectoral Innovation Performance, Evidence from CIS 3 micro-aggregated data, Europe Innova, 2007, <http://www.europe-innova.org>
- Falk, M., Unterlass, F., Determinanten des Wirtschaftswachstums im OECD-Raum, Teilstudie 1, WIFO-Weißbuch, 2006.
- Falk, R. Hözl, W., Leo, H., On the Roles and Rationales of European STI Policies, WIFO Working Paper, 299/2007.
- Falk, R., Leo, H., 'What Can Be Achieved By Special R&D Funds When There is No Special Leaning Towards R&D Intensive Industries?', WIFO Working Papers, 2006, (273).
- Gerschenkron, A., 'Economic Backwardness in Historical Perspective', Harvard University Press, 1962.
- Giddens, A., Liddle, R., Diamond, P. (eds.), Global Europe, Social Europe, Polity Press, Cambridge, United Kingdom, 2006.
- Gordon, R. J., Issues in the Comparison of Welfare Between Europe and the United States, Paper presented to Bureau of European Policy Advisers, 'Change, Innovation and Distribution' Brussels, 4 December 2007.
- Griffith, R., Redding, S., Van Reenen, J., Mapping the Two Faces of R&D: Productivity Growth in a Panel of OECD Industries, *The Review of Economics and Statistics*, 86(4): 883-895, 2004.
- Hollanders, H., Innovation Modes: Evidence at the Sector Level, Europe-Innova, Innovation Watch, 2007, <http://www.europe-innova.org>
- Hözl, W., Friesenbichler, K. Final Sector Report Gazelles, Sectoral Innovation Watch, Europe Innova, 2008, www.europe-innova.org
- Commission of the European Communities (CEC), Implementing the Community Lisbon Programme: A policy framework to strengthen EU manufacturing — towards amore integrated approach for industrial policy, COM(2005) 474 final, Brussels, 5.10.2005.
- Krueger, D., Kumar, K., US-Europe Differences in Technology-Driven Growth: Quantifying the Role of Education, *Journal of Monetary Economics*, 2004.
- Leo, H., Reinstaller, A., Unterlass, F., Motivating sectoral analysis of innovation. Performance, Europe Innova, 2007, <http://www.europe-innova.org>
- Nicoletti, G., Scarpetta, S., Regulation, Productivity and Growth: OECD Evidence, *Economic Policy*, 18:36 9, 2003.
- OECD, Education at a Glance, OECD, 2006.

Peneder, M., Entrepreneurship and technological innovation, An integrated taxonomy of firms and sectors, Europe Innova, Wifo, 2007, <http://www.europe-innova.org>

Sapir, A. et al. 'An Agenda for a Growing Europe', Oxford University Press, 2004.

Vandenbussche, J., Aghion, P., Meghir, C., Growth, Distance to Frontier and Composition of Human Capital, Journal of Economic Growth, Vol. 11, No 2, p. 97-127, 2006.

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