Adjustment of Europe's Industries in a Competitive World

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Europe's industry is confronted with challenges that reflect partly technological shocks and partly the advancing process of globalization. In recent months, concerns have been expressed about possible loss of manufacturing jobs to overseas locations while the threat of competition from China is raising intense anxieties not just in Europe; the debate is equally vigorous in the U.S. where thousands of jobs are rumoured to be in the process or to have already migrated abroad.

Uncertainty inevitably increases during periods of structural change. The period since the mid-1990s can, of course, be characterized as one such period of vigorous structural change caused primarily by technological shocks.

The EU is facing two challenges: Competition from advanced nations (productivity) and from accession countries (cost).

At least three factors have contributed to this. First, the technological revolution associated with the deployment of ICT technologies and the concomitant enterprise re-organization; secondly, the on-going process of trade and capital account liberalization has reduced barriers in international trade and investment and has expanded possibilities for locating production in areas different from the market where a product is sold as well as opportunities to act pre-emptively and position oneself in growing markets to exploit first-comer advantages; and, third, international and domestic competition has intensified, leading to various adjustments and economic strategies on the part of enterprises to cope with a changing business environment. The outcome of these has been rapid productivity growth, the pace of innovation has accelerated and new business opportunities have emerged. This process has also been accompanied by employment losses. Historically, such employment losses in declining sectors have been offset by employment growth in other segments of the economy so that overall employment has grown over time even though during this transitional phase jobs have come under threat or have been lost. No wonder that employees and entrepreneurs find today's business environment hostile and insecure.

The competitiveness challenge the EU is currently facing is twofold; first, there is one emanating from advanced nations, a challenge determined by relative innovation and productivity performance; and, secondly, one emanating from developing nations and from the new Member States based on relatively low cost and standardized technology that makes possible product imitation. It is certain that the EU will benefit most by meeting the first challenge; meeting the second may not even be feasible in a liberalized international trade and investment environment.

The present article, which might be taken as a response to the concerns about the future of Europe's industries, addresses some of these issues. Section II discusses developments in productivity growth in Europe's industries in recent years; section III reviews the changing pattern of specialization of the European manufacturing industry using some key international trade data; section IV discusses the issues of deindustrialization and delocalization and the likely threat they pose for Europe's industries; finally, section V concludes.

Productivity growth and competitiveness of European enterprises in recent years

Productivity growth is a key ingredient of competitiveness. Enterprises are competitive when they experience high and sustained total factor and labour productivity growth that make possible reductions in costs per unit of output compared to other enterprises domestically or internationally. Such productivity growth provides the resources to

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finance the firms' expansion plans, it enlarges the market for their products by changing relative prices and it raises the real wages of employees and ultimately real incomes. As the productivity-enhancing practices of successful enterprises are diffused throughout the economy, overall productivity and real incomes increase. Improving productivity growth is tantamount to strengthening competitiveness.

Europe's weak productivity performance since 1995, symptomatic undoubtedly of deteriorating competitiveness, is in sharp contrast with the galloping productivity growth recorded in the U.S.

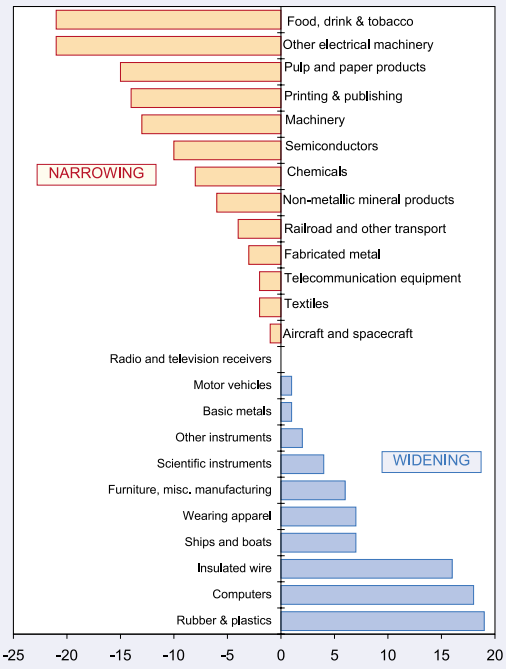
Hourly productivity growth in EU manufacturing eased from an average of 3.4 percent in the period 1979–1990 to 2.3 percent in 1995-2001 but in the U.S., over the same periods, it rose from 3.4 percent to 3.8 percent. However, it is in the service sectors (especially distributive trades and financial services) where a remarkable acceleration in US productivity growth has taken place that has not been matched in the EU, although EU productivity growth in the communications sector has outstripped that of the U.S. by a considerable margin.[1]

The widening productivity differential in both the manufacturing and in the services sectors is a worrying development. Manufacturing accounts for around 20 percent of value added in the EU and poor productivity growth in this sector will inevitably affect aggregate measures of productivity but even more so for the service sectors which represent around 70 percent of value added in the EU.

Clearly, understanding productivity developments in the largest sector of the economy should be the key to explaining differential productivity growth across the Member States in the EU and against the U.S. Future research should, therefore, investigate the determinants of productivity growth across services within the EU and against the U.S. Work by the McKinsey Global Institute has already documented that a dominant part of the aggregate productivity differentials across nations reflects productivity differentials in the service sectors.[2]

Figure 1

WIDENING/NARROWING OF EU LABOUR PRODUCTIVITY GAP RELATIVE TO US FROM 1994 - 1996 TO 1999 -2001



Source: M. O'Mahony and B. van Ark (ed., 2003): op. cit., footnote 1.

The U.S. productivity growth advantage over the EU concerns around 50 percent of industries – mainly market services and high-tech manufacturing – and only a limited number of industries account for the rapid US productivity growth – electronic valves and tubes, wholesale and retail trade and office machinery. In the EU, productivity growth the communications sector, in ICT intensive business services and in computer–related activities as well as in banking and in electronic valves and tubes in the latter part of the 1990s has outstripped that of the U.S.[3]

The EU has a productivity advantage in scale-intensive industries and science-based manufacturing

For the manufacturing sector, Figure 1 shows that it is some high-tech sectors (scientific instruments, insulated wire, computers) that have contributed considerably to increasing the EU productivity differential relative to the U.S. while lower-tech sectors (such as food, drink and tobacco and pulp and paper) have contributed to narrowing the differential over the period 1999–2001 compared to the period 1994–1996.

Overall, the data suggest that the EU has a productivity advantage in scale-intensive industries

[1] See M. O'Mahony and B. van Ark (ed., 2003).
[2] See W. Lewis (2004). Lewis brings together material from individual country studies that the McKinsey Global Institute has conducted over a number of years.
[3] See O'Mahony and B. van Ark, op. cit., for details.

and in science-based manufacturing but it has a disadvantage in key service sectors such as supplier-dominated services and client-led services. The latter are important findings not least because they lend support to Lewis' proposition that it is consumer demand that drives productivity through improving service to customers, better prices and better products rather than industry-led initiatives.[4]

Information and communication technologies (ICT) have been credited for the remarkable productivity acceleration experienced by the U.S. since 1995. There is also concern that the productivity slowdown in the EU reflects failure to undertake technological modernization and to invest in the organizational capital that should accompany the introduction and diffusion of ICT.

Here, it is important to distinguish between ICT producing sectors and sectors intensively using ICT as well as non-ICT users. It is the potential these technologies have to improve productivity performance due to its penetration and diffusion in non-producing sectors that clearly matters most.

The U.S. is ahead in the productive application of ICT outside the ICT producing sector

Table 1 shows that in both the U.S. and the EU the ICT producing group experienced very high rates of productivity growth, especially manufacturing. ICT producing services (communications, computer software) is the only group that shows a pattern of accelerating growth in the EU and decelerating in the U.S., but this group has a small value added and employment share.

In ICT using sectors, productivity growth in the EU has been relatively stable across time in contrast to a very large acceleration in the U.S., mostly in services sectors where a growth rate of 5.3 percent was recorded in the period 1995–2001. This, together with the larger share in the U.S., is a clear indication that the U.S. is ahead in the productive application of ICT outside the ICT producing sector itself. This evidence again indicates that the service sectors are crucial in the determination of aggregate, economy-wide, productivity growth.

Finally, note that in non–ICT industries the EU has a productivity advantage compared to the U.S. but this has been eroding during the latter part of the 1990s. This group, whose share in value added is quite substantial (64 percent in the EU), is performing below the productivity growth of the total economy, suggesting that this group of industries will not likely be the engine of growth and wealth creation in the EU's future.

Europe's specialization in international trade

Europe's weak productivity growth in the period since the mid-1990s will have undoubtedly affected the performance of European industries and enterprises in international trade. Such performance is closely linked to the problem of deindustrialization discussed in the next section. This section follows up on the discussion of the contribution of different sectors to narrowing or widening of the EU productivity differential against the U.S. noted previously. It discusses developments in the trade performance of EU manufacturing but not of services since, despite their growing importance, the necessary data are not available.

The discussion is based on two measures of Revealed Comparative Advantage (RCA) called

[4] See W. Lewis, op. cit.

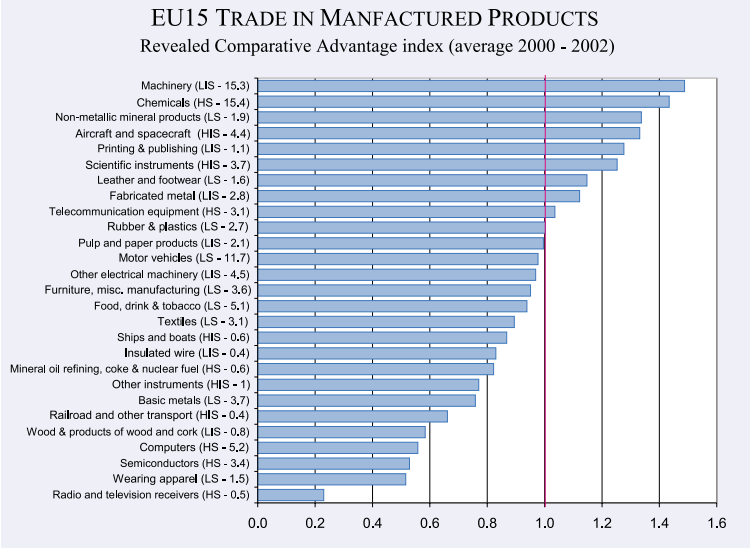
Table 1

Labour productivity growth and value added

	1990–1995		1995–2001		Value added (1999)	
	EU	US	EU	US	EU	US
Total economy	2.3	1.1	1.7	2.2	100	100
ICT producing industries	5.9	8.1	7.5	10.0	6.2	7.7
ICT producing manufacturing	8.4	16.1	11.9	23.7	1.3	2.7
ICT producing services	4.8	2.4	5.9	1.8	4.9	5.0
ICT using industries	2.0	1.2	1.9	4.7	30.2	34.6
ICT using manufacturing	2.4	-0.6	1.8	0.4	6.9	5.1
ICT using services	1.8	1.6	1.8	5.3	23.3	29.5
Non-ICT industries	2.1	0.3	1.0	-0.2	63.6	57.7
Non-ICT manufacturing	3.6	2.7	1.6	0.3	13.6	10.6
Non-ICT services	1.2	-0.5	0.5	-0.3	38.3	36.5
Non-ICT other	3.2	1.2	2.1	0.7	11.7	10.6

Source: Calculations based on M. O'Mahony and B. van Ark (ed., 2003): op. cit., footnote 1.

Figure 2



RCA1 and RCA2.[5] The former shows estimates of averages for the period 2000–2002, the latter the change between 1989 and 2002. These measures assume that good international trade performance in a particular industry reveals comparative advantage[6]; they are based on 27 groups of EU manufactured products. RCA1 is based on EU-15 trade with 90 countries, which account for about 97 percent of total world trade in manufactures and RCA2 is based on EU-15 trade in manufactures with the rest of the non-EU-15 world.[7]

Figure 2 ranks industries according to the value of RCA1 but it also provides information on the skill intensity of the industry[8] and the share of the industry in EU exports, respectively, in parentheses on the vertical axis.

The data show that in one third of the 27 industries the EU has a revealed comparative advantage. But these industries represent 49.3 percent of EU exports. The data suggest a strong comparative advantage in mechanical engineering products followed by chemicals, which together represent 31 percent of EU exports of manufactures. In diminishing rank follow aircraft and spacecraft (export share 4.4 percent), printing (1.1 percent), scientific instruments (3.7 percent), leather products (1.6 percent) metal products (2.8 percent) and telecommunications equipment (3.1 percent). This group of industries employs 43.9 percent of employees in manufacturing.

Five industries rank in a neutral region of no evident comparative advantage or disadvantage. These, which in total represent 24.6 percent of EU exports, range from paper products (share of 2.1 percent) to motor vehicles (11.7 percent). This group employs 23.9 percent of employees in manufacturing. Thus, 67.8 percent of EU manufacturing employment is in industries whose performance in international trade is good.

In one third of the 27 industries, the EU has a revealed comparative advantage

The EU shows a weaker performance in the remaining 13 industries which represent globally 26.3 percent of EU exports of manufactures. These industries employ around 32 percent of employees in manufacturing. Among these only six industries, representing 8.7 percent of manufacturing output (in 2001), have characteristics that might be associated with deindustrialization.[9]

Ranking export performance according to skill intensity shows that there is considerable diversity across EU-15 industries. Among the 27 industries, eleven are classified by O' Mahony and van Ark (2003) as either high-skill-(six) or high-intermediate-skill intensive.[10] There is some evidence that the trade performance in manufactured goods of the EU-15 is concentrated in this category. Indeed, four of the nine industries where the EU has a revealed comparative advantage are high- or high-intermedi-

[5] The indexes are defined as follows:

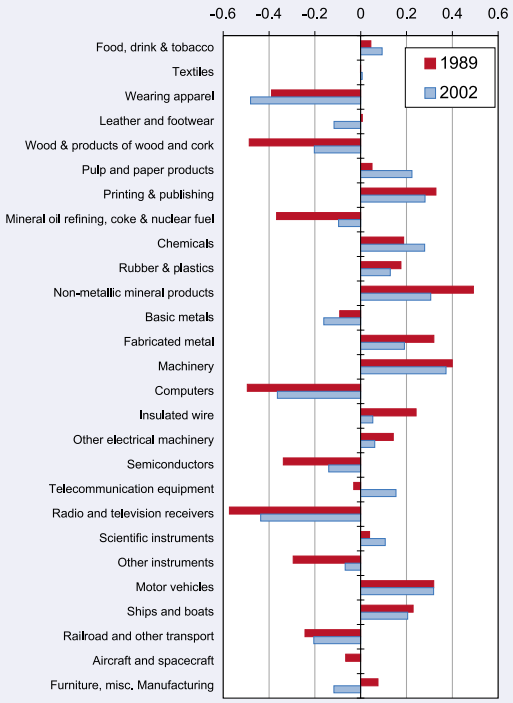
$$RCA1 = \frac{\frac{X_{EU,j}}{\sum X_{EU}}}{\frac{X_{W,j}}{\sum X_{W}}} \quad \text{and} \quad RCA2_j = \frac{(X_j - M_j)}{(X_j + M_j)}$$

where X is the value of exports, M is the value of imports, W is world, EU is the European Union and j is the good index.

[6] It should be stressed, however, that actual trade performance reflects also the effect of trade policy measures (quotas, tariffs).
[7] Data for RCA1 are from the UN database COMTRADE and for RCA2 Eurostat's COMEXT.
[8] The skill taxonomy is obtained from M. O'Mahony and B. van Ark, op. cit. Note that the skill taxonomy applies to final goods and it is likely that high-skill intermediate goods are used in the production of low-skill final goods. This information from input-output tables has not been used here.
[9] These are textiles and clothing, leather and footwear, mining and quarrying, mineral oil refining, coke and nuclear fuels; these have seen declines in employment and value added (in constant prices) in the period since 1979. The data are from M. O'Mahony and B. van Ark (ed., 2003): op. cit., footnote 1.
[10] See M. O'Mahony and B. van Ark, op. cit.

Figure 3

EU15 EXTERNAL TRADE OF MANUFACTURED GOODS (X-M)/(X+M)



ate-skill industries. These are chemicals, aircraft and spacecraft, telecommunications equipment and scientific instruments. The remaining are either low- or low-intermediate-skill industries.

Strong productivity growth and improved trade performance are positively correlated

Among the remaining thirteen industries of weak comparative advantage there are seven that are high- or high-intermediate-skill industries (oil refining, other instruments, railroad equipment, office machinery, electronic equipment and radio receivers). Finally, the intermediate group of no advantage or disadvantage consists of low- or low-intermediate-skill industries.

Figure 3 shows the change in the index of revealed comparative advantage between 1989 and 2002, thus putting the evidence of Figure 2 into perspective. An interesting finding is that the sectors recording a deteriorating comparative advantage employ low and low-intermediate-skilled labour. These 11 industries employ less than 9 percent of manufacturing employment in 2001. As argued in the next section, these may be vulnerable to international competition.

The poor performance of clothing products has worsened. Europe has a poor competitive advantage in this group of products even if in segments European designers dominate. There have been, however, improvements in the performance of the other products, particularly wood but also office machines and radio receivers, and there has been a modest improvement in railroad equipment. Also electronic components and other instruments have improved dramatically their performance between 1989 and 2002.

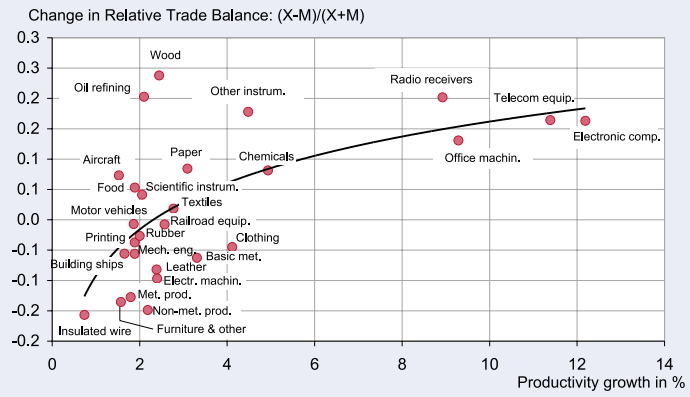
Is there evidence supporting the notion that those industries that have recorded strong productivity growth have also improved their performance in international trade?

Figure 4 plots on the horizontal axis the annual average of (hourly) productivity growth and on the vertical axis the average change in the index of revealed comparative advantage (RCA2)/relative trade balance for 27 industries over the three years 2000, 2001 and 2002 against the average of the three years 1989, 1990 and 1991. It is clear that, with the exception of some outliers (wood products, oil refining and other instruments), the data generally cluster along a positive path suggesting that productivity growth and improvements in the international trade performance of these EU industrial sectors are positively correlated; the correlation coefficient is 0.58 and highly significant (p-value = 0.0015). Further evidence supporting the link between productivity growth and international competitiveness comes from the fact that 8 out of the 10 industries with poor productivity performance vis-à-vis the U.S. shown in Figure 1 are also recording weak international competitiveness (see Figure 3).[11]

[11] The evidence though is not unequivocal since it might be industries with productivity improvements, but performing relatively bad compared to the U.S.

Figure 4

EU15 PRODUCTIVITY GROWTH AND CHANGE IN RELATIVE TRADE BALANCE, 1989 - 2001



Deindustrialization and offshoring

What do these developments in Europe's competitiveness and trade tell us about the threat of deindustrialization and offshoring? Clearly, products and industries that are experiencing declining market shares and declining employment and productivity growth are more vulnerable to shocks that give rise to these phenomena.

Deindustrialization episodes are not new. Both the UK and the U.S. suffered an intense deindustrialization[12] process in the early 1980s. The decline in the relative – and absolute – manufacturing employment in Europe over time is indicative that deindustrialization has been under way throughout the post-war II period.[13] What has in fact been under way is a process of structural transformation of the economy with a growing share of services in national income.

All modern industrial economies have seen the share of manufacturing decline over time. A *stylized fact* of economic history is that employment in manufacturing follows an inverted U-curve: as income per capita rises manufacturing employment rises and after a peak it begins to decline. In the EU, the share of manufacturing in value added has declined from 30 percent in 1979 to around 20 percent in 2002; the share of manufacturing employment has also declined from 28 percent in 1979 to 18 percent in 2001. The rising share of services in national income is a historical inevitability.[14]

The current debate reflects two concerns. First, the experience of the UK and US during the 1980s shows that, while job loses occurred in the steel and other labour-intensive and "rust belt" sectors, both countries ultimately saw rising employment in more skilled and high-tech activities. The current economic slowdown in the EU does not guarantee that new jobs will be created to replace those lost. Secondly, deindustrialization is often accompanied by offshoring of some jobs as activities are transferred abroad; however, this time part of the offshoring process includes high-tech and research-intensive jobs as opposed to the blue-collar job migration that has been traditionally easier to accept. That could well have serious implications for Europe's future competitiveness.

There are two issues that may be raised here.

• Competitiveness and the potential scale of deindustrialization

First, taking into consideration the structure of the EU's international trade what is the potential scale of the deindustrialization problem? To answer this, it is necessary to recall that the dominant part of the international trade of advanced industrial economies in manufactured goods takes place between industries, a reflection of product differentiation and of scale economies.[15] Data suggest that as much as

Structural change: Employment in manufacturing follows an inverted U-curve

[12] For the concept of deindustrialization see "Some Key Issues in Europe's Competitiveness – Towards an Integrated Approach", Communication from the Commission to the Council and the European Parliament, COM (2003) 704 final, 21.11.2003.

[13] Several factors contribute to and/or can trigger a deindustrialization process: liberalization of international trade and competition from low-wage countries which will affect low-skilled jobs and labour-intensive industries- the potential shock of China's entry in world trade can have significant implications; the same can be said for outsourcing towards the new Member States in the EU; changes in expenditure patterns where a combination of high productivity growth and gently or steeply rising Engel curves explain much of the falling (rising) share of manufacturing (services) in national income; and differences in productivity (higher in manufacturing than in services) that are reflected in relative price changes. A sustained appreciation of the real exchange rate could also contribute to the deindustrialization process. Offshoring can be caused by improvement in international communications, the computerization of business services as well as the availability of an educated labour force that is prepared to perform the same work for less pay. This has been typically the case with English-speaking countries such as India. Clearly, when feasible, offshoring presents attractive opportunities for enterprises and confers benefits to consumers; see B. Bernanke (2004), for a discussion.

[14] See R. McGurckin (2004), for a discussion of the broader trends internationally and the issue of recent US job losses.

[15] See, for example, the discussion in OECD (2002): "Intra-Industry and Intra-Firm Trade and the Internationalization of Production", *OECD Economic Outlook* no. 71, June available in http://www.oecd.org/dataoecd/6/18/2752923.pdf.

Table 2

World trade matrix in manufacturing products
Origin and destination by income level of countries – 2001

	EU15	High non-EU15	Upper medium	Low medium	Low	Total
EU15	**28.7**	9.5	3.1	3.6	0.6	45.6
High non-EU15	7.1	**16.4**	4.1	3.8	0.7	32.1
Upper medium	2.4	4.8	**0.6**	0.9	0.1	8.9
Low medium	2.8	5.9	1.0	**1.4**	0.5	11.6
Low	0.5	1.0	0.1	0.2	**0.1**	1.9
Total	41.5	37.7	8.9	9.9	2.0	100

Source: Calculations based on data from the UN databank COMTRADE.

62 percent of world trade in manufactures takes place between EU-15 and high-income countries; if upper-medium income countries are included, this percentage increases to 76.7 percent[16], as can be seen in Table 2. Therefore, competitive threats, among which deindustrialization, clearly emanate from competition with countries producing similar products as the EU and to a far lesser extent from low-income countries.

In fact, even if there are specific product categories in which the EU (and the rest of the industrial world) compete with labour abundant countries, the dominant part of our trade performance is determined less by relative factor abundance than by productivity and innovation, as Figure 5, which shows the size of EU trade by the level of income of its partners, confirms.[17] As was shown previously, industries intensive in low and low–intermediate skills that are recording deteriorating comparative advantage employ less than 9 percent of total manufacturing employees. Thus, the competitiveness challenge comes primarily from advanced industrial nations like the EU.

Competitive challenge comes primarily from advanced countries producing similar goods

There is, however, some evidence that China is already competing in some *prima facie* surprising products categories with the EU. According to the European Competitiveness Report, exports from China to the EU in 2002 originating in high-skill industries amounted to more than 20 percent of total exports from China, surpassing those from the new Member States; exports originating in medium-skill/white-collar industries were almost 30 percent again surpassing those from the new Member States; exports from medium-skill/blue-collar industries have remained stable at around 20 percent while exports from low-skill industries have declined, amounting to around 30 percent.[18] These developments reflect a growing competitive challenge in human-capital intensive industries such as the delivery of ICT products.

Thus, the challenge posed by trade conducted with low-wage nations cannot be disregarded. This risk is particularly evident in those regions and those industries in the EU which compete directly with those exporters. To facilitate adjustment, it is essential to have a strategy to respond to this challenge within the enlarged Europe. Elements of such a strategy were presented in a recent Commission Communication.[19]

• Do we benefit from structural change?

Second, since deindustrialization and, to some extent, offshoring are predominantly a reflection of structural change that all economies will undergo as their incomes rise and as globalization expands, what are some of their implications?[20]

Clearly, there can be significant employment losses in the short

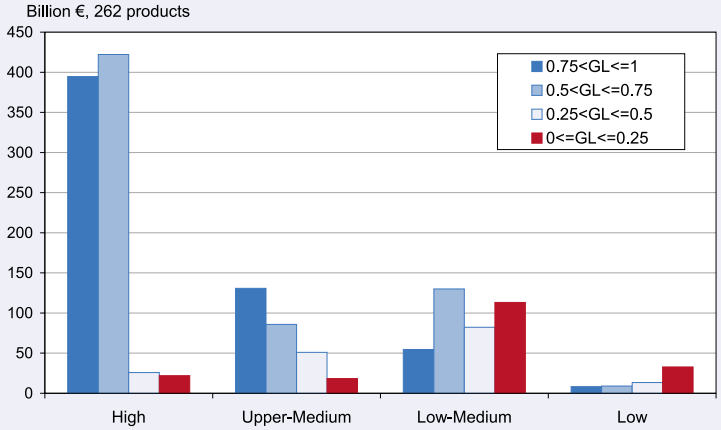
[16] The data for the world trade matrix are obtained from the United Nations COMTRADE data bank.
[17] The index in Figure 5 is the Grubel-Lloyd (GL) index defined as

$$GL_i = 1 - \frac{|X_i - M_i|}{X_i + M_i}.$$

The values of the index range from 0 (no intra-industry trade) to 1 (all trade is intra-industry). The index is sensitive to the level of aggregation of the products: it increases with the level of aggregation, without necessarily implying trade in *similar* products. The index is useful for comparisons across products and over time but it can over-state the size of IIT trade and fail to reveal different levels of intra-industry trade within a given group of products. For the calculation of the GL index and the distribution of trade, a total of 262 products (4 digit of the Classification of Products by Activity nomenclature) have been used.

Figure 5

TOTAL TRADE (EXPORTS + IMPORTS), THE GRUBER-LLOYD (GL) INDEX AND INCOME LEVEL OF PARTNERS



[18] See European Commission (2004): *European Competitiveness Report,* forthcoming.
[19] See "Fostering Structural Change: An Industrial Policy for an Enlarged Europe", Communication from the Commission to the Council and the European Parliament, COM (2004) 274 final, 20.04.2004.
[20] William Poole notes succinctly that "(M)uch of what is happening today is an unavoidable consequence of new technology. Rather than complaining about the consequences of new technology, or trying to roll back its effects, we need to adapt and use technology in innovative and constructive ways"; see W. Poole (2004).

term associated with structural adjustment. These will be especially severe in local labour markets and those characterized by low labour mobility. However, over the medium term the economy will be more efficient and will be using its resources more rationally. Employment will also increase albeit in different sectors than those experiencing decline.[21] But even during the transitional period domestically produced goods and services will absorb some part of employment lost. Besides, a high proportion of jobs are in sectors that cannot easily be moved abroad.

Offshoring can be a source of benefits since the process also creates value for the home country through several channels: through cost saving for the companies that move abroad; through imports of goods and services from the home country by the providers abroad; through repatriated earnings; and indirectly through redeployed labour (with high average wages). According to the McKinsey Global Institute, for every US$ offshored to India a net gain of 12 to 14 cents is generated.[22]

Catherine Mann estimates that outsourcing of IT hardware has reduced prices in the U.S. by 10–30 percent or more, it has promoted the diffusion of IT investment and use, it has added at least $ 230 billion to GDP and has contributed to the acceleration of productivity growth.[23] Finally, Mann notes that those service sectors investing more in information technologies (IT) and employing more IT workers post a trade surplus despite slow growth and closed markets abroad.

Concluding remarks

Is Europe experiencing deindustrialization? There has been no generalized decline in output and in employment, simultaneously, in European manufacturing. High productivity growth has contributed to raising industrial output without concomitant changes in employment. However, the data suggest that there are some sectors that are vulnerable. If deindustrialization occurs in these sectors this would be a "local" problem. In part this problem arises from competition from low-wage countries, especially in technologically standardized products with little scope for additional productivity gains. But despite the "localized" job losses, deindustrialization due to international competition brings higher profits for firms that might choose to offshore activities, leading to lower prices for consumers and long-run benefits for the economy.

This is not to say we should not worry. Adjustment policies aimed at easing the transition to the evolving structural change in our economies are necessary. It is essential that the EU has a domestic strategy that facilitates adjustment within the large internal market.[24] A special problem arises when delocalization and offshoring threaten technologically advanced manufacturing industries and services. This might signal trouble for Europe ahead unless we strengthen our competitiveness and innovation in high-value products to create new jobs.

The dominant part of trade of advanced industrial economies is intra-industry; this means that it will be easier to adapt to structural change through resource shifts within industries and within firms in the same industry rather than across sectors. Europe's competitiveness challenge emanates primarily from advanced industrial countries producing similar goods. These producers compete on the basis of innovation and productivity performance using as a springboard their factor endowments rather than using static factor abundance to determine the nature of their international trade. A better understanding of productivity growth in the service sectors is essential.

Deindustrialization and offshoring are a reflection of structural change and bring long-term benefits for the economy

Productivity growth is a critical determinant of international trade performance. Data from industries with strong competitive performance correlate well with strong productivity growth. The slowdown in productivity growth in the EU in the more dynamic industrial sectors especially when compared to the U.S. is a serious challenge that raises doubts about the prospects for improving Europe's competitiveness. Innovation is the principal source of high value added products and R&D and innovation are closely related. Europe must improve its innovation performance and raise its R&D efforts significantly.

[21] There is already evidence from European data that this is under way. Egger and Egger (2003) report that the fall of the Iron Curtain led Austrian manufacturing to resort to outsourcing motivated by low wages. The removal of trade barriers strengthened this outsourcing process. The authors estimate that a 1 percent increase in outsourcing to Eastern countries relative to gross production shifts relative employment by 0.1 percent in favor of high-skill jobs. Outsourcing, they note, accounts for around a quarter of the change in relative employment in favor of high-skilled jobs over the 1990s, a phenomenon likely to gain in importance with enlargement; see H. Egger and P. Egger (2003).
[22] See V. Agrawal and D. Farrell (2003).
[23] See C. Mann (2004) and C. Mann (2003).
[24] Some of these issues were addressed in COM (2004).

Despite its decreasing prominence, the manufacturing sector remains a significant channel for innovation and application of new technologies. New capital vintages embody the latest technologies whose successful economic application ultimately raises contributes to improving productivity performance and competitiveness. Public policy ought to remove barriers to technology diffusion, in particular ICT, and to encourage the growth of innovative enterprises. Moreover, policies for market access abroad are an essential ingredient of an international strategy supporting the manufacturing (but, clearly, not only) sector. A vigorous manufacturing sector depends on and supports a strong service economy.

References

Agrawal V. and D. Farrel (2003), "Who Wins in Offshoring?", *The McKinsey Quarterly,* No. 4, Global Directions.

Bernanke, B. (2004), "Trade and Jobs, http://www.federalreserve.gov/boarddocs/speeches.

COM (2003), "Some Key Issues in Europe's Competitiveness – Toward an Integrated Approach," Communication fro the Commision to the Council and the European Parliament, 704 final, 21 Nov.

COM (2004), "Fostering Structural Change: An Industrial Policy for an Enlarged Europe," Communication from the Commission to the Council and the European Parliament, 274 final, 20 April.

Egger H. and P. Egger (2003), "Outsourcing and Skill-Specific Employment in a Small Economy: Austria after the Fall of the Iron Curtain, *Oxford Economic Papers,* 55.

European Commission (2004), *European Competitiveness Report,* forthcoming.

Lewis, W. (2004), The Power of Productivity Wealth, Poverty and the Threat to Global Stability, University of Chicago Press.

Mann, C. (2004), "Global Sourcing and High-Tech Jobs: Productivity Gains and Policy Challenges," power point presentation at the Institute for International Economics, March 11.

Mann, C. (2003), "Globalization of IT Services and White Collar Jobs: The Next Wave of Productivity Growth," *International Economics Policy Briefs,* No. PB03-11, December.

Mc.Gurckin, R. (2004), "Can Manufacturing survive in Advanced Economies?", *Executive Action* no. 93, The Conference Board, March.

O'Mahoney, M. and B. van Ark, eds. (2003), *EU Productivity and competitiveness: An Industry Perspective. Can Europe Resume the Catching-up Process?*, prepared for the EU Enterprise Directorate General.

Poole, W. (2004), "Trade, Wages and Employment," Federal Reserve Bank of St. Louis, March 25, http://www.stls.frb.org/news/speeches/2004/03_25_04.html.