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Contents

Industry in Belgium: past developments and challenges for the future

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Introduction

For more than a century, industrial activity has been the main driving force behind Belgium's economic development. However, for some thirty years, and particularly since the first oil shock, industry has been dogged by questions about its future, while service activities have grown in importance, benefiting especially from the remarkable progress of information technologies. These questions have become all the more pressing in recent times which have been marked by a great deal of uncertainty caused by limited economic growth in the euro area, exchange rate movements and the rapid development of new economic hubs in the global economy.

The international organisations concerned with economic matters, and also various national and regional authorities, particularly in the European countries, have devoted a number of studies and reports to these questions in recent years. In the spring of 2004, the social partners in Belgium asked the Bank to carry out an analysis of Belgian industry in light of the changes it is undergoing and the challenges that lie ahead.

This article summarises all the work done in this connection by the Bank and, on certain points, by the Federal Planning Bureau (FPB). Some of the work that has fuelled the debate has already been the subject of articles included in the Economic Review and other work is likely to be covered in the Bank's publications in the next few months.

This summary is divided into a section that describes and analyses past and recent developments, and a section dealing with the necessary conditions and the action that economic agents must take in order to face up to the challenges of the future. More specifically, the first section analyses the underlying forces to which industry[1] has been exposed throughout the western hemisphere (deindustrialisation and globalisation), highlights the special features of Belgian industry in this context and concludes with an examination of a number of specific forces that are currently at play and which either reinforce the underlying trends or hold sway over them. The second section makes the general assertion that, faced with these forces, which have far-reaching implications for the government, firms and workers, an integrated strategy for maintaining the competitiveness and adaptability of the economy as a whole and, ultimately, its prosperity, is required. It then highlights a number of factors that determine that capacity (private and public-sector investment, human capital, R&D, the financing of business, environmental considerations) before suggesting the way forward for industrial policy, involving the search for synergies within a diverse body of policies.

(1) Unless otherwise stated, the definition of industry used in the analysis corresponds to manufacturing industry excluding energy and construction, i.e. the NACE-BEL codes 15 to 37. However, in the direct and cumulative approaches of the input-output tables, industry is defined as the sum of total manufacturing (15-37), excluding refined petroleum products (23), and of mining and quarrying except energy producing materials (13-14), with the aim of creating an "energy" category that represents all energy-related costs (mining and quarrying, refined petroleum products, production and distribution).

1. Understanding structural change in the economy

1.1 Underlying forces

Over the last few decades, the industrial economies have been subjected to some powerful trends, including what are referred to as deindustrialisation and globalisation, both of which have had a particularly marked effect on industrial activity. In all of these countries, these phenomena have exerted similar pressures leading to a considerable change in the structure of the economies and the way in which the production process is organised.

1.1.1 Deindustrialisation

The phenomenon known as deindustrialisation refers to the sectoral changes that have been taking place for several decades. These are most clearly manifested in the transfer of activities and jobs from industry to services, radically changing the structure of the economy which is now dominated by the service sector: in Belgium, the share of services in total value added at current prices increased from 53.4 p.c. in 1970 to 74 p.c. in 2003, largely to the detriment of industry, whose weight declined from 29.3 to 17.4 p.c.

However, deindustrialisation must be viewed as relative rather than absolute, since industrial output has continued to grow. Moreover, the growth in the volume of activity in industry has been on a par with that of market services[1] or the economy as a whole. Thus, measured at constant prices, the weight of the main categories of activity in total value added in the economy has changed little, if at all, over the last thirty years. Moreover, industry retains considerable importance in some key areas, such as foreign trade and business R&D, in both of which it accounts for more than 80 p.c. of the economy's total.

The forces underlying these sectoral shifts stem from both the demand and supply sides. Thus the profile of private consumption appears to be shifting in favour of services, depending on the degree of development of the economy in question. Aside from the nominal effect of the slower rise in industrial prices compared with those for services, a degree of saturation as regards industrial products seems to go hand in hand with rising incomes, whereas demand for services would appear to be supported by a number of socio-demographic developments: the greater participation of women in the labour market creates demand for childcare services; the ageing population results in greater
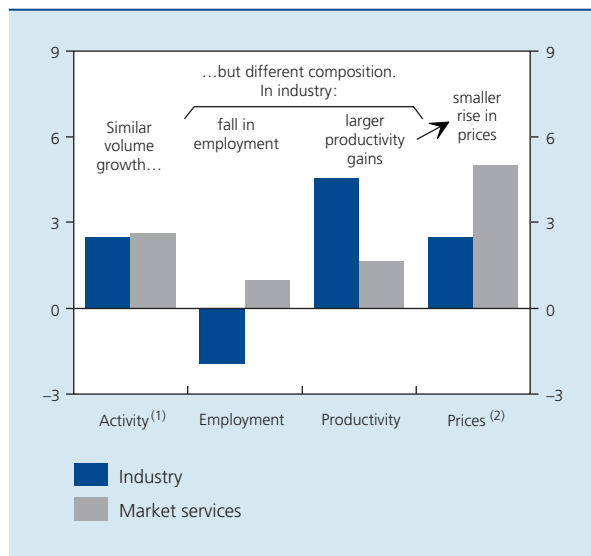
(1) Defined as NACE-BEL branches of activity 50 to 74.

CHART 1   SECTORAL CHANGES IN BELGIUM
(Percentages of total value added)

Sources: NAI, OECD.

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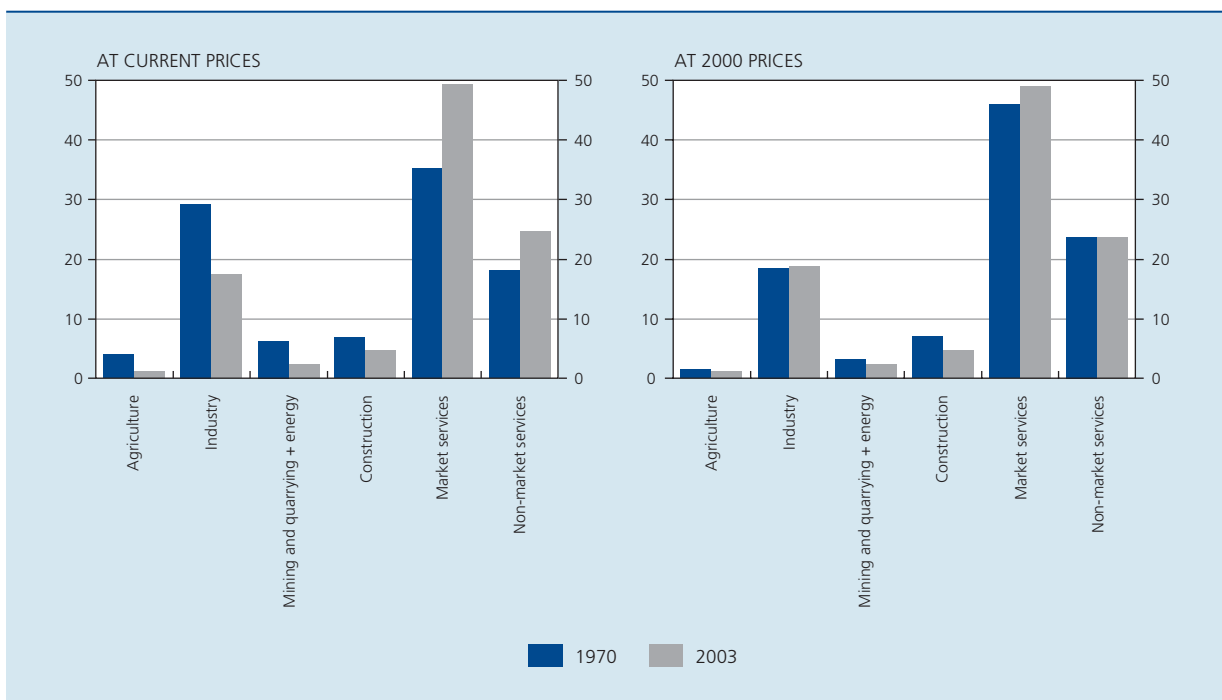
CHART 2   THE NATURE OF GROWTH IN INDUSTRY
AND SERVICES IN BELGIUM

(Percentages, average annual change between 1970 and 2003)

Sources : NAI, OECD.
(1) Value added at constant prices.
(2) Value-added deflator.

demand for healthcare, while also increasing the amount of leisure time available, and, coupled with the liberalisation of the financial markets, has a bearing on demand for financial services. Furthermore, industry has achieved substantial productivity gains that surpass those achieved in the service sector. These productivity gains were made possible by the surge in technological progress, which industry is better placed than services to incorporate swiftly into its production process. The exchangeable nature of industrial products is also significant, as it exposes industrial firms to considerable competitive pressures. Indeed, these pressures are intensified by globalisation, and in particular the opening up of world trade to low-wage countries. They are particularly marked in the more traditional branches of industry, such as textiles and steel, which produce basic goods using a large, low-skilled workforce. Services, on the other hand, have hitherto been sheltered to some extent from international competition, particularly as a number of markets are not yet fully liberalised.

The substantial productivity growth in industry lies at the heart of the mechanism of deindustrialisation, because it allowed for a less rapid rise in prices compared with the prices of services, which explains the differences in the development of the share of activity depending on whether it is expressed in terms of value or volume. It also fuelled the growth momentum, while reducing the total number of industrial jobs in Belgium.

In fact, some 565,000 net jobs were lost in industry between 1970 and 2003. But during the same period around 1,115,000 net jobs were created in services, specifically public-sector jobs, until the late 1970s, and after that mainly jobs in the health and social work branches and in business activities. Overall, taking into account the decrease in jobs in other branches, particularly agriculture and mining and quarrying, the Belgian economy has created some 370,000 jobs since 1970.
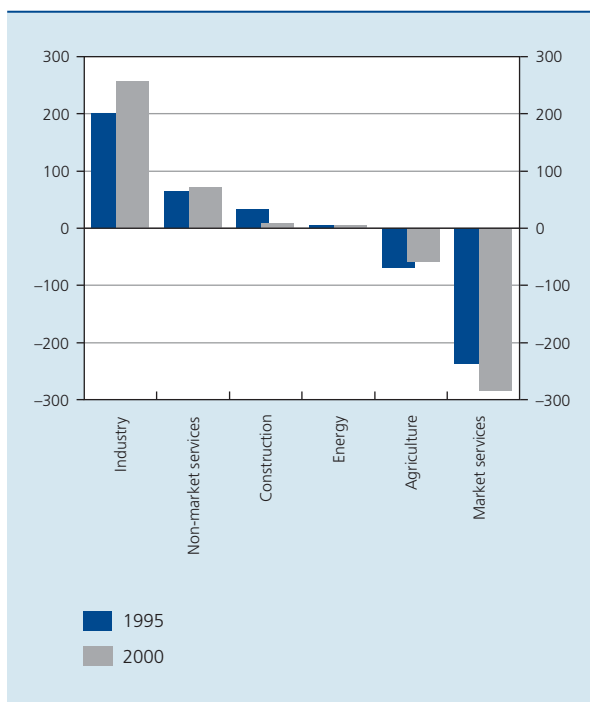
The rapid growth of business activities partly reflects the strengthening of mutual ties between the industrial and service sectors due to sectoral shifts and technological advances. Generally speaking, industrial output depends on the efficient provision of services, whilst those services can take advantage of the technological advances emanating from the industrial sphere to improve their productivity. Moreover, in some respects industry and services are now tending to share features that used to be specific to each of these categories of products and their production process, making their distinction blurred and, in some cases, superfluous. On the one hand, technological progress allows for the separation of production and consumption of a service in time or space, thereby making its storage and transportation possible. On the other, the production of industrial goods is becoming more and more personalised depending on the user's needs.

In its ever-increasing search for efficiency, industry is focusing on its core business, by outsourcing secondary administrative, logistical or organisational tasks, and this effectively entails a transfer of activities and jobs to the service sector. Consequently, the value added generated by the business activities branch showed sustained average annual growth of 3.6 p.c. between 1980 and 2003, compared with GDP growth of 1.9 p.c. Moreover, French industry made increasing use of temporary personnel during the 1990s (DATAR, 2004), thereby reducing the number of jobs recorded in industry and, consequently, raising its productivity, as temporary personnel are registered as service providers (Gonzalez, 2002[1]). It can be assumed that this phenomenon was also relevant in Belgium, given that during the latter half of the 90s, the share of industry in temporary work was higher than in previous years.

All in all, the relationships between branches of the economy are such that many non-industrial jobs depend on industrial activity. Besides, of the major categories of activity, industry is the branch that entails the greatest number

(1) This study shows that, between 1996 and 2000, growth in apparent labour productivity in industry could be overestimated by 0.5 to 1 percentage point a year, relative to a corrected index that takes account of temporary labour in industry, in terms of both value added and employment.

1995
2000

Sources: NAI, NBB calculations.
(1) Figures based on the input-output tables. Here, industry and energy are defined according to the concept used for the analysis of these tables.

increased significantly and, for the whole of industry, rose from 25 to 30 centimes per euro of production of industrial goods between 1995 and 2000. The result of this was that the share of intermediate consumption of market services in the cumulative cost of production of industry climbed from 16.6 to 18.7 p.c. – growth which cannot be readily explained by the differences in the development of prices [1].
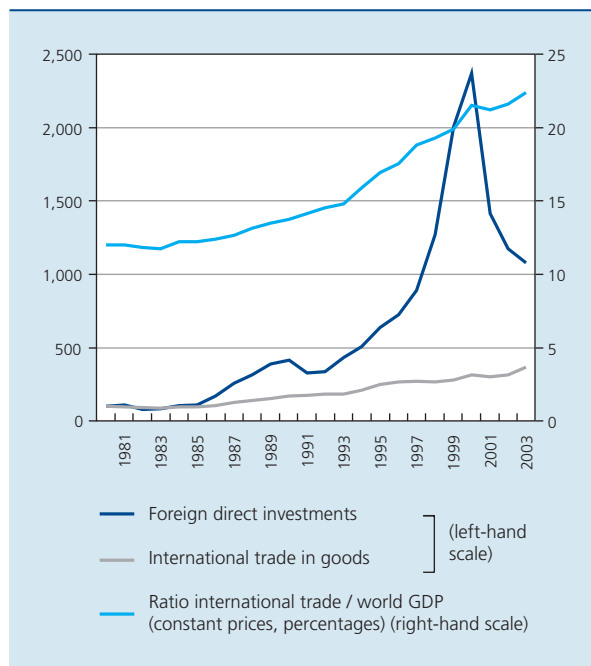
1.1.2 Globalisation

The other major trend that has profoundly altered the environment in which industries develop is the globalisation of the economy; this should not be seen separately from the structural changes, behind which it has been a key factor.

The notion of globalisation refers to the wave of rapid internationalisation of the global economy, which has occurred on various fronts over the last few decades: international trade (which multiplied by 3.5 between 1980 and 2003), capital flows (foreign direct investments increased eleven-fold during the same period, having peaked in 1999 and 2000 due to the spate of mergers & acquisitions), information flows and production organisation. This globalisation was driven by a policy of liberalising national markets, particularly financial markets, and by the conclusion and implementation of numerous multilateral (WTO) and regional agreements (ASEAN, EU, MERCOSUR, NAFTA) which increasingly led to the opening up of the markets for goods and services and capital. In addition to the trade in goods, this liberalisation gradually extended to services, with domestic markets opening up to foreign service providers. However, internationalisation on this scale would have been inconceivable without the technological advances that significantly reduced the costs of transporting not just goods and people, but information as well. In addition, it has taken place mostly through multinational firms which, according the UNCTAD's World Investment Report 2002, accounted for two thirds of global trade in the second half of the 1990s.

of indirect jobs. The input-output tables indicate that, in 2000, the cumulative employment required to produce industrial goods exceeded employment observed in the industry branch by 257,000 units (Cornille and Robert, 2005). This means that jobs in other branches used indirectly for the production of industrial goods far exceeded the industrial jobs assigned indirectly to other types of production. In particular, industry entailed the creation of 268,000 market-service jobs, some 115,000 of those in business activities and 62,000 in the wholesale trade.

Since 1980, industry has made ever-increasing use of market services, and business activities in particular, and this continued to be the case in the most recent period. Thus the number of market-service jobs that depend on industry rose from 214,000 in 1995 to 268,000 in 2000, which means that industry helped create 54,000 of the 143,000 jobs generated in market services during that period. In fact, for many industrial goods, the second-round effects of production on market services have

These developments triggered a fundamental and ongoing reorganisation of the way in which western industries function. Indeed globalisation makes for a more efficient distribution of the production process, thereby enabling the economies in question to raise their level of productivity and prosperity. Moreover, the opening up of new and fast-developing markets presents great opportunities for expansion. In the case of the countries of central and eastern Europe, this effect was magnified by their geographical proximity and the prospect of integration in the European single market. In China's case, it is the sheer size of the potential market that matters. For consumers,

(1) The drawback of the input-output tables is that they are expressed at current prices, which hinders the interpretation of changes from one year to the next.

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CHART 4   FOREIGN DIRECT INVESTMENTS AND
INTERNATIONAL TRADE IN GOODS

(Current prices, indices 1980 = 100, unless otherwise stated)

— Foreign direct investments   (left-hand scale)

— International trade in goods

— Ratio international trade / world GDP
(constant prices, percentages) (right-hand scale)

Sources : OECD, UNCTAD.

the intensification of international trade opens up a wider range of reasonably-priced goods and services.

In macroeconomic terms, the consequences of globalisation, i.e. the rising level of development of the emerging countries, resulting in increased demand, and achieved productivity gains also benefit the developed economies. Admittedly, however, the opening up of borders and the emergence of new players on the global economic stage might pose a threat to some areas of activity and force companies to make some difficult changes. In the past, competition from low-wage countries was keenly felt by some branches of activity categorised as traditional, insofar as they mass-produced standard goods with low value added. The usual response tended to be that the western industries should specialise in the higher value-added products or segments of the production chain. Recent developments, however, are beginning to render such specialisation somewhat obsolete, insofar as they entail increased "all-out" competition : some of the low-wage emerging countries have potential reserves of manpower which are far greater than the levels Portugal or the central and eastern European countries had available to them in the past ; some of these new players are competing in the field of high-tech products (Hungary, Czech Republic) ; relocation now extends to services as well (IT, call centres, etc.)

which were long thought to be sheltered from this trend ; and, finally, there is still increasing competition among the western countries, developing similar forms of production.

Consequently, whilst the theory of comparative benefits continues to be valid in terms of explaining the relative specialisations of the different countries, it now applies to a wider range of elements involved in the production process : not just the supply of natural resources or production factor volumes, but also human capital, technological potential, etc. It now implies a qualitative international division of labour, with economies ranked according to product type (traditional vs. high-tech), or within a range of products – or even, for a single product, according to the degree of complexity and value added of the production stage. Consequently the value-added chain is becoming increasingly segmented, particularly under the influence of the multinationals which are able to optimise their production processes at global level. This segmentation also entails specialisation by function within the production process, whereby the design and distribution of a product are the preserve of the western economies, based on their supply of skilled human capital, and the intermediate stage of mass production is undertaken, at the lowest cost, by the low-wage countries (Henriot, 2004).

From an international trade perspective, these developments have led to the growth of intra-regional and intra-industry trade. This trend can be observed in every country, including Belgium, where intra-industry trade has always been particularly important due to the processing nature of industry : in 2001, 88.9 p.c. of industry's foreign trade was generated by industry itself, compared to 73.4 p.c.

TABLE 1   INTERNATIONAL INTRA-INDUSTRY TRADE

(Percentages of industry's foreign trade [1])

	1961-1970	1991-2000	2001
Euro area [2]	52.6	71.6	73.7
Germany	54.6	76.5	76.7
France	76.4	86.5	85.6
Netherlands	78.5	87.9	87.4
BLEU / Belgium [3]	73.4	85.4	88.9
United States	57.4	71.8	71.8
Japan	34.8	50.0	58.0

Sources : OECD, NBB.
(1) Grubel-Lloyd index, which indicates the extent to which the structure by product is the same for both imports and exports.
(2) Non-weighted average of intra-industry international trade of the twelve euro area countries.
(3) BLEU for 1961-1970, Belgium thereafter.

in the 1960s. Therefore, activity in terms of trade and competition takes place mainly between countries in close proximity offering similar products rather than with low-wage countries in distant parts of the world.

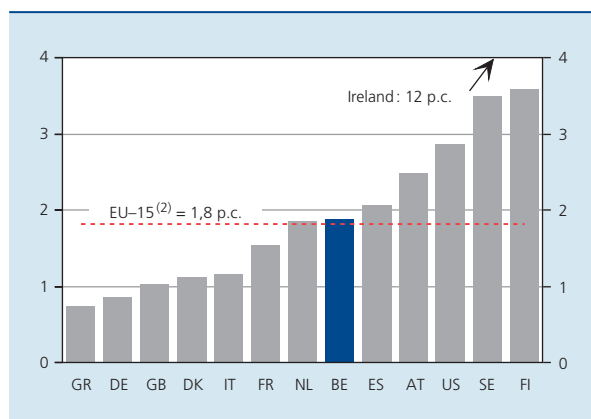## 1.2 The position of Belgian industry

1.2.1 Common features

Belgian industry has not escaped the underlying forces which have just been discussed, so both its recent history and current situation display many similarities with those of the other European countries. In Belgium, deindustrialisation has been both relative, in that it has involved a decline in the weight of industry in the economy's nominal value added, and absolute in its impact on jobs. At the same time, industrial activity grew in real terms by an average of 1.9 p.c. per annum between 1980 and 2003, outpacing the big European countries. Nevertheless, it has proved less dynamic than in other small, open economies such as Austria and some of the Scandinavian countries.

Based on its current direct weight in the economy's total value added (18.2 p.c. in 2002), the position of industry in the Belgian economy is average for the EU-15. On the one hand, the Belgian economy appears to have a less dominant service sector than the major economies that are very advanced in this field, such as the United Kingdom or the United States, where industry now accounts for no more than 15 p.c. of GDP. On the other, industry plays a less prominent part in Belgium than in other major economies

■ 2002
■ Change between 1980 and 2002 (percentage points)

Sources : GGDC, NAI, OECD.
(1) 2001.

such as Italy or Germany or some small countries where it is newer and based largely on high-tech sectors (Ireland, Finland, Sweden) ; in these countries, the share of industry is often significantly greater than 20 p.c.

The relative importance of industry varies greatly across the country's three regions. In 2003, more than 70 p.c. of the value added of Belgian industry was generated in Flanders. Aside from this region's total weight in the economy, it is also the region with the greatest reliance on industry, which accounts for 21.6 p.c. of the region's activity. The share of industry in Wallonia's value added is slightly below the national average. Lastly, due in particular to its specific status as a metropolitan region, the Brussels region has the most atypical structure, with market services accounting for a weight of over 60 p.c. compared with less than 50 p.c. for the country as a whole ; consequently, industry represents just a little over 6 p.c. of activity in that region.

Besides having a similar total weight in the economy, Belgian industry displays a relatively similar structure to the average in the other EU-15 countries ; generally speaking, the differences in specialisation between these countries are fairly small (ECB, 2004). Nevertheless, Belgian industry does have a number of special features, the most notable being the preponderance of chemicals. Having experienced the most vigorous growth of all branches of industry during the last two decades, the chemicals branch

CHART 5   GROWTH IN INDUSTRIAL ACTIVITY IN THE EU-15 AND THE UNITED STATES
(Average annual percentage change in industry's value added at constant prices, 1980-2003 [1])
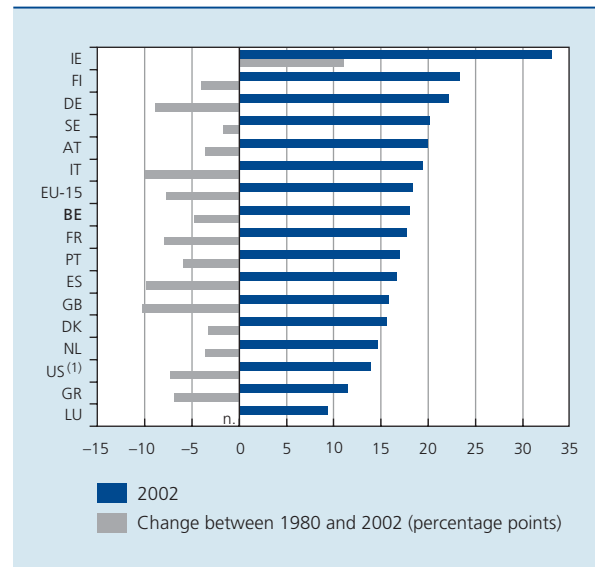

Sources : GGDC, NAI, OECD.
(1) Until 2002 for Ireland and the United Kingdom and until 2001 for the United States.
(2) Non-weighted average, excluding Ireland and countries not listed.

TABLE 2   THE STRUCTURE OF INDUSTRY IN BELGIUM AND IN THE REGIONS IN 2003

(Percentages, current prices)

	Flanders	Wallonia	Brussels	Belgium
Share in value added of Belgian industry	71.1	22.0	7.0	100.0
Share of industry in the total value added of the economy	21.6	16.3	6.3	17.4
Structure (selected branches, share in the value added of industry) :				
Chemicals	20.1	21.5	12.9	19.9
Metallurgy	14.0	16.9	7.0	14.1
Transport equipment	9.7	3.5	15.4	8.7
Electrical and electronic equipment[1]	7.3	6.4	6.8	7.1
Non-metallic mineral products (not including rubber and plastics)	3.6	12.0	3.6	5.4

Source : NAI.

(1) Notably office machines, computers, electrical apparatus, radio, television and communication equipment, medical and precision instruments.

represented 19.8 p.c. of industry's value added in 2002, compared with an average 10.6 p.c. in the other EU-15 countries. This branch, which includes the pharmaceutical sector, is in many respects vital to Belgium's industry and economy. It typifies its specific features, in particular the heavy capitalisation of production, high productivity and large foreign financing through the involvement of multinationals. Moreover, the chemicals branch occupies a similar position in the country's two most industrial regions, although its weight is a little greater in Wallonia than in Flanders. Furthermore, although Flanders has a structure which, overall, is much the same as that of the country as a whole, Wallonia exhibits a distinct specialisation in non-metallic mineral products, offset by the under-representation of the transport equipment branch, which is over-represented in Flanders, and especially in Brussels.

Compared with the other countries of Europe, Belgium is also notable for its relative shortage of more technological products : the electrical and electronic equipment branch totalled 7.4 p.c. of industrial value added in 2002[1], against an average 11.6 p.c. in the EU-15 countries. Moreover, Belgium is one of those rare countries where this branch has not made one of the biggest contributions to the growth of industry in recent years. Yet the development of such activities and the technologies they produce, and also their dissemination across all branches including services, go hand in hand with a strengthening of both productivity and competitiveness of the advanced economies. In Finland and Ireland, which are among the few European economies that have a more specialised

(1) This weight moves within a range of a little more than one percentage point across the country's three regions, with Wallonia lagging behind Flanders and Brussels.

TABLE 3   THE SPECIALISATION OF INDUSTRY IN BELGIUM COMPARED WITH THE EU-15 IN 2002

(Percentages of industry's total value added at current prices)

Over-representation	Belgium	EU-15[1]	Under-representation	Belgium	EU-15[1]
Chemicals	19.8	10.6	Electrical and electronic equipment[2]	7.4	11.6
Metallurgy	14.1	11.8	Paper and publishing	7.7	10.6
Transport equipment	8.9	6.7	Machine tools, industrial machinery	6.4	8.5

Sources : NAI, OECD.

(1) Excluding Spain and Sweden.

(2) Notably office machines, computers, electrical apparatus, radio, television and communication equipment, medical and precision instruments.

industrial structure, this branch occupies a dominant position of around 22 to 25 p.c.

1.2.2 Distinctive features

Although the development of industrial activity in Belgium has mirrored that of other industrialised countries, this has been at the cost of greater adjustments having to be made to the production process. The decline in industrial employment started earlier and was much more pronounced in Belgium than in the other countries, after the oil shocks led to a loss of competitiveness: between 1970 and 2003, the number of jobs fell by 48 p.c. in Belgium, compared with a decline of around 30 p.c. in Germany and France, and of less than 10 p.c. in the United States and Italy. Globally, a comparison between the United States and Europe reveals that, although the same basic trends have dominated on both sides of the Atlantic, in Europe the adjustment in industry mainly affected the level of employment whilst in the United States the effect tended to be on wages (Rowthorn and Ramaswamy, 1997).

In fact, because of its degree of openness and its specialisation in the production of intermediate goods, allied with high labour costs, Belgian industry has, even more than elsewhere, been motivated to achieve major productivity gains and to undertake rationalisation investments. Consequently, it is notable for its high levels of labour productivity and capitalisation.

This rationalisation has been widespread given that, in the majority of industry branches in Belgium growth in activity has been sustained by productivity gains against a backdrop of falling employment. However, the good performance of industry as a whole masks the patchy development of the different branches. The branches that have grown most rapidly owe this fact to the extent of productivity gains achieved and broadly stable employment. Conversely, the weaker growth of some branches is due to more extensive restructuring in terms of employment, which have been offset to a lesser degree, if at all, by productivity gains. These heterogeneous performances have distinctly altered the structure of Belgian industry and explain the strong growth of the chemicals sector, for instance.

Although, from a European perspective, Belgian industry does not have an atypical structure, it does exhibit a specialisation in the production of semi-finished goods. This processing nature results in a lower value-added component of production compared with the other EU countries, insofar as this type of production requires an extensive use of basic products for intermediate consumption,

CHART 7   EMPLOYMENT IN INDUSTRY

(Indices 1970 = 100, number of people employed in industry)
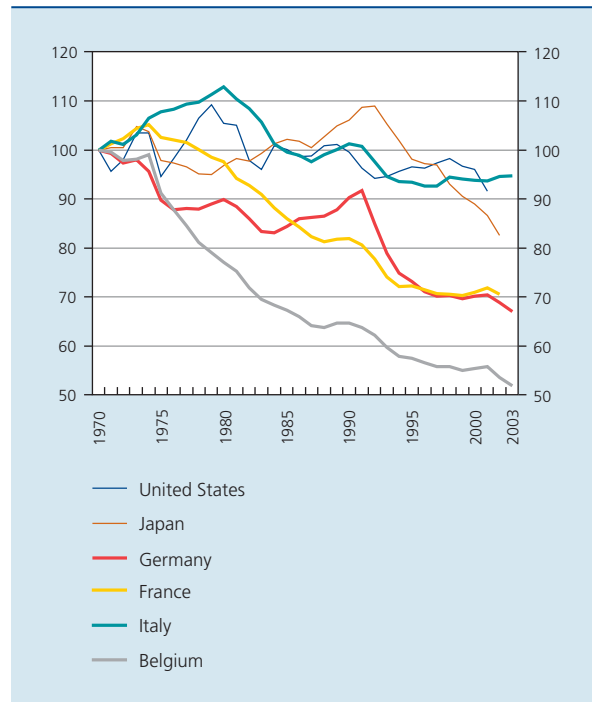
Sources: NAI, OECD.

whereas the subsequent stages and resulting value added are taken care of by the final producer. The ratio of value added to production, which in recent years has been close to 25 p.c., was 3 to 8 percentage points below the level achieved by the other countries. This weakness across the whole of industry can only to a very small extent be explained by an unfavourable structure, because it also manifests itself at individual branch level. Moreover, it is still apparent if all the relations between the domestic branches involved in the production of industrial goods are considered, and this is due to leakage effects outside the national economy – through imports – that are more pronounced than elsewhere. The greater dependence on energy than in the other European countries also serves to increase intermediate consumption and limit the share of value added in production. In this respect, the industrial structure does have an effect, as two of Belgium's three major branches – chemicals and metallurgy – are among the largest users of energy. Lastly, compared with other small economies for which data are available, industry in Belgium seems to make slightly greater use of market services, a sign of a higher level of outsourcing of activities that are deemed peripheral to the core business, which fuels its intermediate consumption.

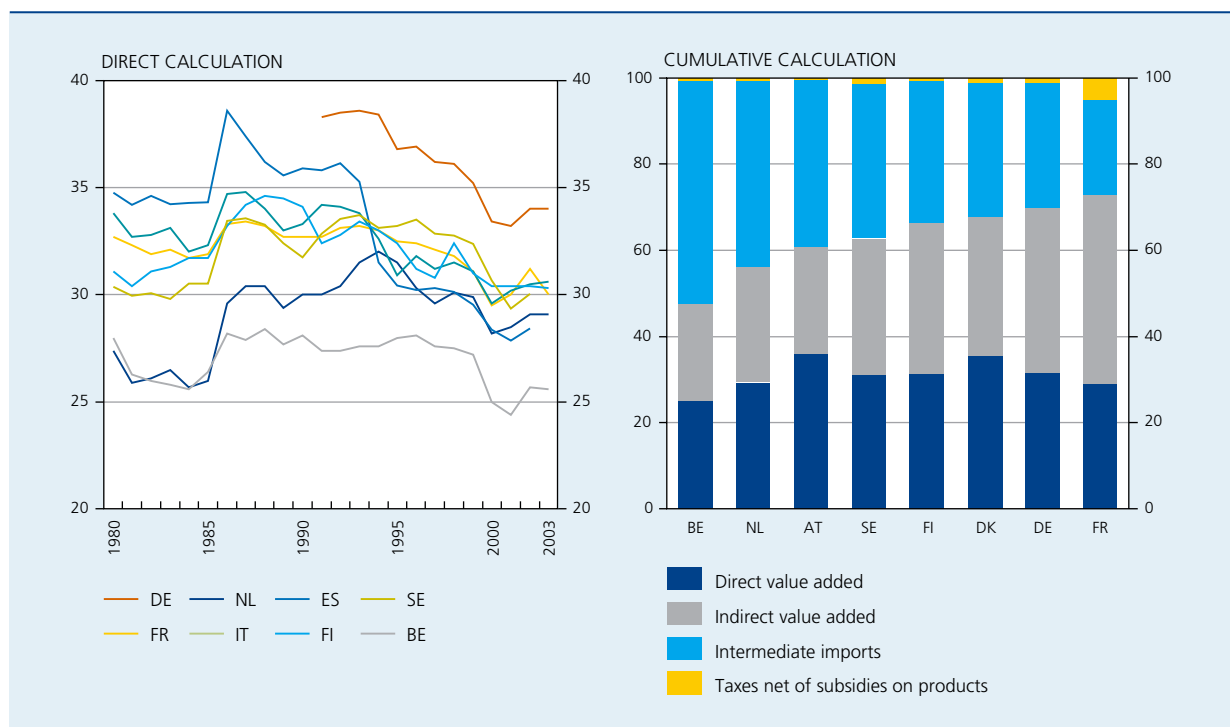**CHART 8**   LABOUR PRODUCTIVITY AND CAPITAL INTENSITY IN INDUSTRY

(Indices Belgium = 100, purchasing power parities based on GDP against the US dollar)

PRODUCTIVITY BY EMPLOYMENT
(2002)

GROSS FIXED CAPITAL FORMATION BY EMPLOYMENT
(1997-2001 average)
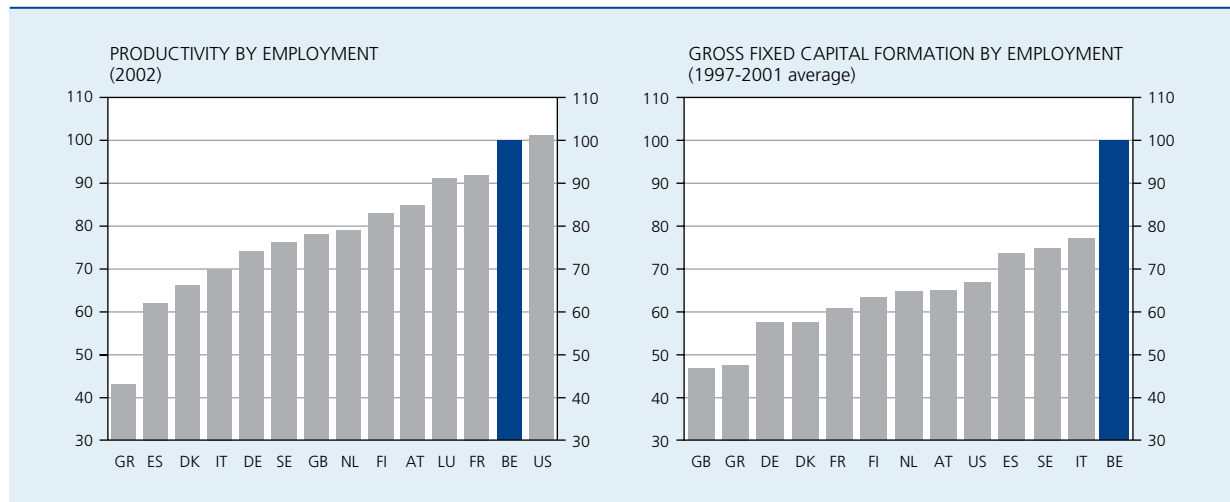
Sources : NAI, OECD.

CHART 9   VALUE-ADDED CONTENT OF INDUSTRIAL OUTPUT [1]

(Percentages of output)

DIRECT CALCULATION

CUMULATIVE CALCULATION

- DE
- NL
- ES
- SE
- FR
- IT
- FI
- BE

- Direct value added
- Indirect value added
- Intermediate imports
- Taxes net of subsidies on products

Sources : EC, NAI, OECD, NBB calculations.

(1) The direct calculation relates industrial value added to industrial output, as observed in the annual national accounts. By going up the production chain, the cumulative calculation takes account of both the value added generated directly by industry and the value added generated indirectly by all branches of the economy as a result of their output for intermediate consumption by industry. As specified in the introduction, in the cumulative calculation based on the input-output tables the delimitation of the branches of industry differs somewhat from that generally used in this article.

1.3 Specific features of the current situation

1.3.1 Globalisation gathers pace

The enlargement of the EU to include ten new Member States (NMS) on 1 May 2004 and the rapidly increasing power of large emerging economies such as China and India have further highlighted the effects of globalisation, which are now encroaching on activities that were long thought to be sheltered from this trend. In a context of weak economy with an appreciating currency, fears are rife in Europe that the decline of industry might gather pace, or worse, that this latter could disappear altogether, and the debate about the threat of relocations has resurfaced, even extending beyond the industrial sphere. Considering its reliance on trade and foreign capital, are Belgium's industry and economy particularly vulnerable? Or are they able to play their part in the emerging economic order?

Relocations

It should be pointed out that, for our purposes, relocations should be understood as the cessation of an activity in the national economy with a view to replacing it with production carried out abroad[1]. Relocations may involve foreign direct investments (FDI) in order to develop exactly the same activity abroad, or recourse to sub-contracting or imports. However, production activities may cease for plenty of reasons other than relocation, which must be viewed as just one manifestation of the structural changes that go hand in hand with economic development. As a direct result, relocations give rise to job losses and require adjustments within the economy, be it between regions, branches or job categories. Ultimately, however, they can also ensure the survival of a business, and therefore the safeguarding of existing jobs or the creation of new activities or new jobs.

Generally speaking, the available studies suggest that the impact of relocations has been relatively limited thus far. According to the studies cited by Grignon (2004), they accounted for around 4 p.c. of outgoing French FDI between 1997 and 2001 and caused 2 p.c. of job cuts involving more than 50 people in the United States between 1998 and 2003, whereas investments in the countries of central and eastern Europe brought about the loss of 90,000 German jobs between 1990 and 2001. Based on microeconomic data, Aubert and Sillard (2005)

estimate that, between 1995 and 2001, 0.35 p.c. of French industrial employment was relocated each year, a little less than half that figure to the emerging countries.

Nor, based on recent figures on FDI and foreign trade which only provide an overall, indirect picture of this phenomenon, does Belgium appear to have witnessed any surge in relocations in recent years.

Overall, the Belgian economy is still attracting foreign investment. According to balance of payments data, which record international flows of funds relating to investment transactions[2], the Belgian economy has been a net beneficiary of FDI, with amounts of foreign investment in Belgium exceeding Belgian investments abroad by 0.7 p.c. of GDP per annum on average between 1995 and 2003, compared with 0.1 p.c. of GDP in the United States and net outflows of 0.9 p.c. of GDP for the whole of the EU-15. By way of comparison, the NMS and China recorded much larger net inflows over the same period, amounting to a little more than 4 p.c. of their GDP.

Whilst net inflows of capital from direct investments have fluctuated within a narrow band, gross flows of FDI into Belgium and of FDI from Belgium to other countries have grown very fast since 1995, fuelled by the service sectors. These operations have been stimulated by market liberalisation, especially in the field of telecommunications, and by technological developments. They took the form of a spate of mergers & acquisitions around 2000, at a time when the stock market was rising rapidly.
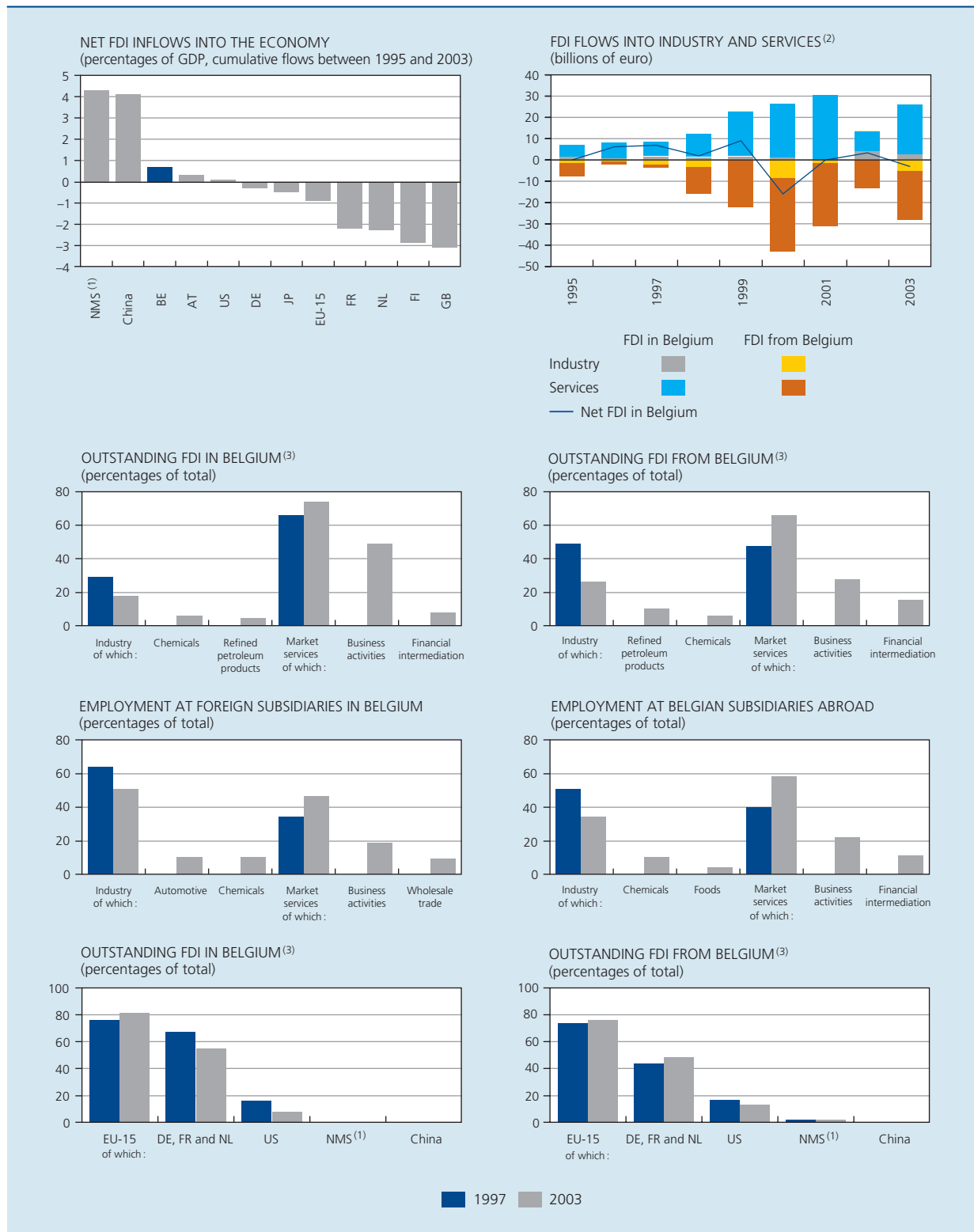
In the space of a few years, the share of market services in the total volume of FDI has increased markedly to the detriment of industry: in 2003, the former totalled 74 p.c. of incoming FDI and 65.8 p.c. of outgoing FDI respectively. Aside from the importance of financial intermediation services, the bulk of these FDI involves the business activities branch, which includes coordination centres. These and, to a lesser extent, the headquarters of multinationals in Belgium, act as hubs, recording very substantial gross incoming flows in the form of capital contributions by foreign parent companies; these funds are then used to grant loans to the various group companies, which constitute outgoing flows.

The recording of FDI on a financial basis sometimes distorts the real size of those investments in terms of activity and employment. However, the statistics recording employment at subsidiaries established abroad (FATS) also reveal the growing importance of services in FDI, albeit less so than in the volume of FDI. Thus foreign subsidiaries established in Belgium still employ more workers in industry than in services, with the chemicals and automotive sectors leading the way. In 2003, business activities

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(1) For a discussion of the different meanings of the term "relocations", see inter alia Drumetz (2004), Grignon (2004) and Henriot (2004).

(2) The balance of payments records FDI in accordance with the specifications set by the IMF, which defines FDI as the acquisition of a lasting interest (conditional on the holding of at least 10 p.c. of the ordinary shares or voting rights) by an entity domiciled in an economy in an enterprise domiciled in another economy. Therefore, these statistics, which are purely financial in nature, do not necessarily tell us much about investments in physical capital.

CHART 10   FOREIGN DIRECT INVESTMENTS (FDI) FOR BELGIUM

NET FDI INFLOWS INTO THE ECONOMY
(percentages of GDP, cumulative flows between 1995 and 2003)

FDI FLOWS INTO INDUSTRY AND SERVICES[2]
(billions of euro)

FDI in Belgium   FDI from Belgium

Industry

Services

— Net FDI in Belgium

OUTSTANDING FDI IN BELGIUM[3]
(percentages of total)

OUTSTANDING FDI FROM BELGIUM[3]
(percentages of total)

EMPLOYMENT AT FOREIGN SUBSIDIARIES IN BELGIUM
(percentages of total)

EMPLOYMENT AT BELGIAN SUBSIDIARIES ABROAD
(percentages of total)

OUTSTANDING FDI IN BELGIUM[3]
(percentages of total)

OUTSTANDING FDI FROM BELGIUM[3]
(percentages of total)

1997   2003

Sources : UNCTAD, NBB.
(1) Ten new EU Member States.
(2) Excluding reinvested profits.
(3) Equity only.

17

accounted for just 19 p.c. of jobs at these subsidiaries, compared with almost half of the volume of FDI in Belgium. Overall, employment at these subsidiaries of foreign firms represents a slowly rising proportion of total employment, rising from 13.2 p.c. in 1997 to 16.3 p.c. in 2003. As regards the sectoral structure of employment at Belgian subsidiaries abroad, this reflects the image presented by financial stocks. Financial services in particular account for a considerable proportion of this.

Looking at the origin and geographical destination of FDI, it is apparent that the vast majority of business links of Belgian firms occurs with neighbouring countries. Consequently, the NMS and China represented just 1.6 and 0.5 p.c. respectively of Belgian FDI abroad in 2002. With regard to FDI in Belgium, however, the share of investment originating from the US fell markedly from 16.1 p.c. in 1997 to 8 p.c. in 2003, as a corollary of a substantial rise in investments from Europe. This lower level of US investments went hand in hand with a reduction in employment at US subsidiaries established in Belgium.
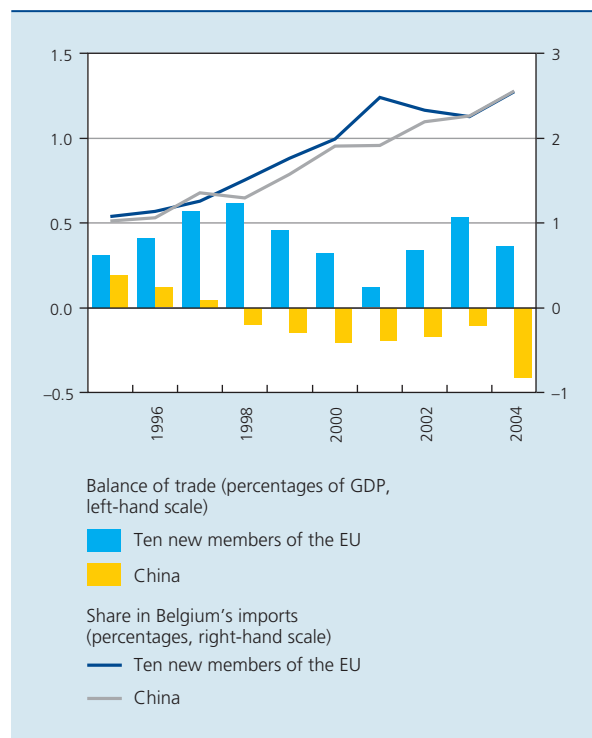
The development of FDI does not simply result from relocations – far from it. Among the various possible causes, "vertical" FDI are designed to achieve efficiency gains, by taking advantage of the differences in production costs between countries, whilst "horizontal" FDI aim to exploit openings on the markets in which they are made. Insofar as the majority of incoming and outgoing FDI involve neighbouring countries with similar characteristics in terms of resources and factor costs, it is likely that they involve either horizontal investments designed to accede to or acquire a strategic position in adjacent markets or vertical investments in connection with the greater segmentation of the production chain. In this respect, Belgium's central location, its transport network, the quality of its infrastructures and its highly skilled workforce are attractive to multinationals seeking to centralise their administrative, financial or distribution activities. As regards Belgian FDI abroad, the level of investment in emerging economies such as the NMS and China might beg the question of whether Belgian business is underrepresented on these rapidly growing markets. FDI made in the NMS, which tend to focus more on service activities, seem to be predominantly horizontal [1].

Foreign trade statistics are a second source that might indicate the occurrence of relocations, insofar as they ought to entail a rise in imports and a decline in exports.

On this basis, no renewed upsurge in relocations is discernable. The balance of trade recorded by industry shows a comfortable surplus, which is a major factor in the surplus achieved by the economy as a whole. It amounted to some 7.5 billion euro in 2004 and is mainly attributable to the chemicals and food industries.

However, the overall trade surplus of the Belgian economy masks some geographical disparities. It consists of a surplus with the EU and a deficit with non-EU countries as a whole. In particular, the erstwhile surplus with China became a deficit in 1998, which widened sharply in 2004 to 1.2 billion euro. Conversely, the balance of trade between Belgium and the NMS remains positive – in the region of 0.4 p.c. of GDP between 1995 and 2003 – and in fact reached one of its highest levels in 2003. Generally speaking, trade with the NMS and China has intensified to a similar extent; between 1995 and 2004, imports of goods from these two groups of countries increased by around 17 p.c. per annum against growth of 6.4 p.c. in all imported goods. Although rising, the share of these countries in total Belgian imports remains small, however, at around 2.5 p.c. for each group in 2004.

CHART 11   BELGIUM'S FOREIGN TRADE WITH THE EMERGING ECONOMIES

Balance of trade (percentages of GDP, left-hand scale)
- Ten new members of the EU
- China

Share in Belgium's imports (percentages, right-hand scale)
- Ten new members of the EU
- China

Source : NAI.

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(1) According to a survey of Belgian companies that have set up establishments in the NMS, carried out in 2002 by the FBC, 92 p.c. of those companies took this decision in order to gain access to a new market, although the benefits in terms of lower wage costs was also a motive for 55 p.c. of them.

Although they do not point to a spate of relocations in Belgium over the last few years, the indicators used are nevertheless partial and flawed in this regard. Moreover, they predict nothing about the future; a number of surveys have found that the issue of relocation has been considered by a large number of chief executives. Thus, according to the 2004 report of the Conference Board, relocation is one of the main preoccupations of 31 p.c. of chief executives in Europe, as opposed to 24 and 21 p.c. respectively of those heading companies in the US and Asia. Moreover, Belgian firms appear to differ from their European counterparts, as revealed by the latest edition of the UPS Europe Business Monitor survey, published in 2005, which found that 28 p.c. of Belgian firms currently sub-contract abroad, the second highest percentage of the seven countries surveyed after the United Kingdom (33 p.c.). The favourite destinations are China and the NMS (both of which account for 37 p.c. of outsourcing abroad), and the activity most commonly sought is the manufacture of products (42 p.c. of cases). The levels recorded here are higher than in the other European countries.

Whatever the true extent of the relocation phenomenon, the ongoing rationalisation of production processes is a feature in its own right, involving the reallocation of activity and employment. Consequently, in a global environment relocation must be regarded as just one of the manifestations of these structural changes. Some traditional branches, such as clothing, textiles, leather and footwear, have already had to contend with relocations in the past, suffering a decline in their activity, job losses and external trade deficits.

Emerging economies

Recently, the ten new Member States (NMS) of the EU and China have become increasingly integrated in the European and world economy, with strong growth in trade, the receipt of substantial flows of direct investment and a change in their economic structure. Apart from the issue of relocations, the growing power of these emerging economies must be put into proper perspective and the challenges and opportunities this presents have to be defined.

These developments are highly significant for the countries of Europe, albeit for differing reasons. The NMS are distinguished by their geographical and, henceforth, institutional proximity. It is important to remember that, although these countries' actual accession to the EU in 2004 was a significant event, it was just one stage in a process of integration that was already well advanced and is still ongoing. As for China, it is the sheer size of its economy that gives it the status of a special player. Apart from the fact that the country has benefited from

an undervalued exchange rate, China's vigorous growth has hitherto been based more on the volume of production factors at play, underpinned by plentiful reserves of labour, an influx of foreign capital and a very high savings ratio, than on the productivity of those factors.

Thus far, these economies have tended to compete with low-tech products. In 2002, the industry branch of the four largest NMS[1] mainly had a trade surplus in this type of goods, largely as a result of the manufacture of furniture in Poland. This is even more true of China which, because of the abundance of production factors at its disposal, has focused on the mass production of low-tech goods requiring a large amount of low-skilled labour. Although, in the wake of earlier relocations and competition from low-wage countries, our industry can hardly be regarded as specialised in this type of goods any longer, the challenge this presents is no less real for the branches concerned – a fact which is borne out by the reaction to the definitive lifting of import quotas for textiles at the beginning of 2005. Playing the role of "Asia's factory", China operates as an assembly country, importing basic components and high-tech products from Japan and other industrialised Asian countries and exporting the finished products to the United States, the EU and Japan. Consequently, it has a trade deficit with these suppliers and a surplus with the economies it exports to, Belgium among others.

However, both China and the NMS are gradually focusing more on the production of higher value-added goods, thereby creating competitive pressure in segments that tended to be thought of as the preserve of the more developed economies. Some NMS, in this instance Hungary, and, to a lesser extent, the Czech Republic, are already moving in this direction, as their industry generates a trade surplus with the EU-15 in high-tech products[2]. Between 1997 and 2002, the steady increase in Hungary's surplus in radio, television and communication equipment was a major factor, first in the gradual decline of the trade deficit with the EU-15 of the four largest NMS taken together, and then in the surplus achieved in 2002. This new industrial focus, built on FDI and accompanied to a certain degree by a reindustrialisation of the economy, yields parallels with the experience of some of the south-east Asian countries which, with a skilled workforce and low labour costs, had specialised in electronic products.

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(1) Poland, Czech Republic, Hungary, Slovakia. However, these countries have differing profiles, as will become apparent later; their grouping is affected by Poland's great weight.

(2) More precisely in radio, television and communication equipment, for Hungary in particular, and in office and computing machinery. Hungary and the Czech Republic have also focused on mid-tech products, i.e. cars and electrical apparatus.

CHART 12   FOREIGN TRADE OF THE EMERGING ECONOMIES
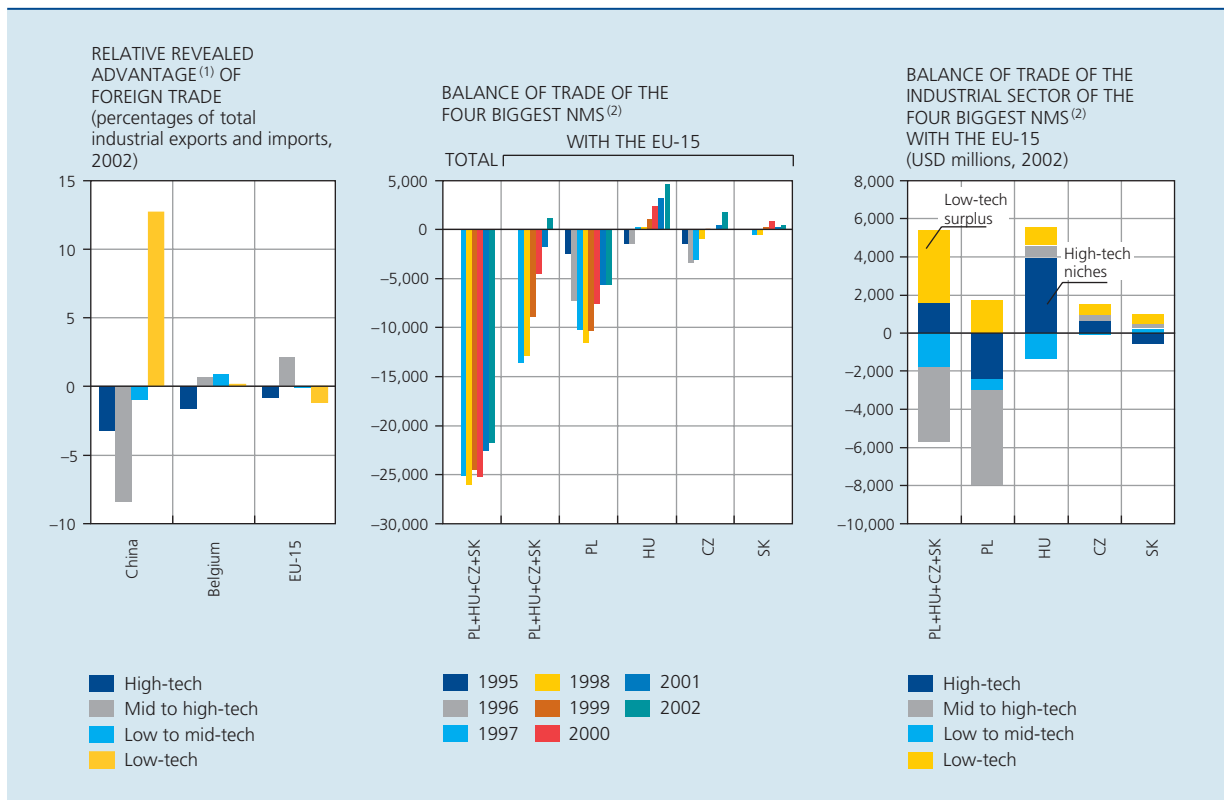
Source : OECD.

(1) Difference between the actual balance of trade of the branches of one type of technology and the balance that would result from the breakdown of the total balance of trade in proportion to the share of these branches in total exports and imports; a positive result indicates that the balance for a given category of products is greater than that category's weight in trade.

(2) Ten new EU Member States.

Generally speaking, it would seem that the NMS are rapidly becoming part of the organisation of the production process on a European scale, as evidenced by the growing proportion of their intra-industry foreign trade. This form of trade already accounts for more than 80 p.c. of all trade in Hungary and the Czech Republic, compared with a little under 90 p.c. in Belgium. Besides the production of increasingly high-tech industrial goods, in future they might also compete in R&D or, in the context of an economy with an expanding service sector, even in the centralised provision of high value-added services for multinationals. This would bring them into direct competition with one of our economy's specialisations.

As for China, it is already moving rapidly towards a more advanced developmental stage, with the emphasis on, among other things, R&D. In 2002, total R&D spending accounted for 1.2 p.c. of GDP, more than in the whole of the NMS or Spain, and was rising sharply. Moreover, in terms of the absolute amount of R&D spending China was ranked 7th in the world, albeit way behind the United

States, the EU and Japan. A relatively unusual aspect about China, compared with other economies that used to specialise in this type of mass production, is its combination of low labour costs and the simultaneous development of research capacities (EC, 2004b). Furthermore, thanks to the substantial flows of direct investment it enjoys, the Chinese economy is rapidly integrating foreign technologies and organisational know-how, while at the same time the State is pursuing a voluntarist industrial policy designed to develop "national champions" that will be able to make their mark in international trade.

However, China's pursuit of rapid economic development will be dependent on numerous factors, including the macroeconomic environment and the stability of the economy and of its banking system, the ironing out of regional disparities, the intensification of the R&D effort, and the creation of effective patent protection laws and of a system for combating counterfeiting.

TABLE 4   GEOGRAPHICAL ORIGIN OF IMPORTS OF THE EMERGING ECONOMIES

(Percentages of total)

Share of imports of…	China			Ten new EU Member States		
From…	1997	2004	Change	1997	2004	Change
EU-15	13.6	12.4	−1.2	68.1	74.3	6.2
Belgium	0.6	0.6	−0.1	1.9	2.9	1.0
Germany	4.4	5.4	1.1	22.8	28.0	5.2
France	2.3	1.4	−0.9	5.1	5.6	0.6
Netherlands	0.8	0.5	−0.2	2.7	4.4	1.7
United States	11.5	7.7	−3.7	4.3	1.4	−2.9
Asia	36.9	40.8	4.0	6.0	7.1	1.2

Source : IMF.

While the growing power of the emerging econo-mies ultimately presents a competitive challenge to our economies, the latter must also be quick to seize the opportunities offered by the opening up of these markets – opportunities that are considerable in China's case – and by the increasing integration of the NMS within a pan-European production process. FDI statistics are of limited use when assessing Belgium's position in these economies, as the geographical origin of the invest-ment flows is clearly heavily centred on the activities of the financial centres (Hong Kong, the Virgin Islands for China) and the centralist practices of the multinationals (the Netherlands for the NMS). Nevertheless, they do confirm the limited involvement of European countries, and Belgium in particular, in China compared with Japan and the United States. As regards the NMS, where, logi-cally, the European effort is greater, Belgian companies have focused more on financial services, primarily in the Czech Republic, with the aim of establishing themselves on these new markets. In industry, Belgian FDI have focused in particular on the mid and high-tech sectors in the Czech Republic and Hungary.

The involvement of foreign countries in these emerging economies is also manifested in imports from the latter. From this point of view, between 1997 and 2004, the strengthening of China's ties with the rest of Asia is clearly apparent, to the detriment of relations with the United States and the EU-15. Belgium is maintaining its position, which is better than the average for the Union, whilst Germany is making headway. Germany is also in the fore-front as regards the increase of the NMS imports from the EU-15, in which Belgium is playing its part too.

1.3.2 The environment that typifies certain industrial branches

Besides the common trends we have discussed thus far, each branch of industry develops in its own environ-ment that may be the source of additional challenges. In Belgium's case, by way of example, the specific context of a number of branches can be highlighted.

The past and current development of the *textile sector* exemplifies the gradual globalisation of a market under the influence of international agreements, as this low-skilled labour-intensive branch has long had to contend with competition from low-wage countries. Major ration-alisation drives ensued, as is apparent from the rise in productivity – one of the largest achieved in industry between 1980 and 2003. At the same time, employment was reduced by 72,000 units, the second biggest fall in relative terms among the industrial branches; overall, growth in activity was one percentage point lower than the industrial average. However, Europe's textile industry is now faced with a fresh onslaught of globalisation : the last import quotas were lifted on 1 January 2005, draw-ing a line under a gradual process of dismantling that began back in 1994. China's admission to the WTO in 2002 profoundly changed the environment, giving rise to fears of a huge influx of competition-busting products from 2005 onwards. While the EC sees a way forward by concentrating on high-end goods, such markets will how-ever not be opened up to European exports overnight.

Steel and glass are two branches that illustrate the processing nature of Belgian industry and which, as a result of mergers & acquisitions, have gradually seen their market taken over by just a few big global players.

Against this backdrop, Belgian companies operating in these areas have been forced to constantly adapt and specialise, by seeking to develop niches.

Meanwhile, *the chemical industry*, which is dominant in Belgium, is one of the most affected by the introduction of various international and European environmental regulations and by the energy issue. The EC has published a white paper on chemical substances, containing the REACH system project. The goal of this project is to create a single framework for assessing the degree to which chemical substances are hazardous and enabling the dissemination of information on the subject, through a central database of companies that manufacture or import more than one tonne a year of a given chemical substance. It relies on the active participation of industry, which would be responsible for performing the assessments and disseminating the information.

The chemical sector will also be called upon to play a major role in achieving the target Belgium has set itself under the Kyoto Protocol: between 1990 and 2001, it accounted for 9 p.c. of greenhouse gas emissions by all economic agents, with industry's total amounting to 34 p.c. of those emissions. Although the chemical sector has made significant efforts by reducing other types of air pollution, at the same time it has markedly increased its emissions of greenhouse gases (by 31 p.c. between 1990 and 2001), which are the only gases targeted by the Kyoto Protocol. In this area, these efforts have only brought about an improvement in terms of eco-efficiency, i.e. pollutant emissions have increased by less than activity. For the whole of Belgium, the Protocol target is a 7.5 p.c. reduction in greenhouse gas emissions by 2008-2012, yet these emissions increased by nearly 10 p.c. between 1990 and 2001. This gives an idea of just how much work still needs to be done, be it in terms of changes to the production process or the costs of buying licences to pollute. The paper and publishing branches, which together account for 7.7 p.c. of industrial activity in Belgium, are another example of an activity that is subject to severe environmental constraints and which will have to show initiative in developing and using clean production processes.

Lastly, although the debate surrounding the future of energy supply and costs affects the whole of industry, it is potentially more pressing for the chemicals branch, which (excluding refined petroleum products) is the largest user of energy. Energy – both raw and processed – made up 9.4 p.c. of the production costs of final demand for chemicals in 2000 (and much more than that for some sub-branches), compared with an average of 4.3 p.c. for the whole of industry excluding refined petroleum products.

2. Guiding the changes to the economy

The processes of deindustrialisation and globalisation requires the constant adjustment of economic structures. Although industry is most exposed, this extends now also to the service branches. More generally, the role and functioning of all economic agents – companies, households and government – are likely to be challenged.

Rather than passively submitting to these changes, which are the result of increasingly intense competition, these agents must take the necessary adjustments in hand in a well-considered and organised way so that they are able to limit the negative effects and derive maximum benefit. By doing so, they will ensure that economic prosperity is preserved and developed, while still being able to organise society according to their shared aspirations. More specifically, in future the government and other economic agents must act to:
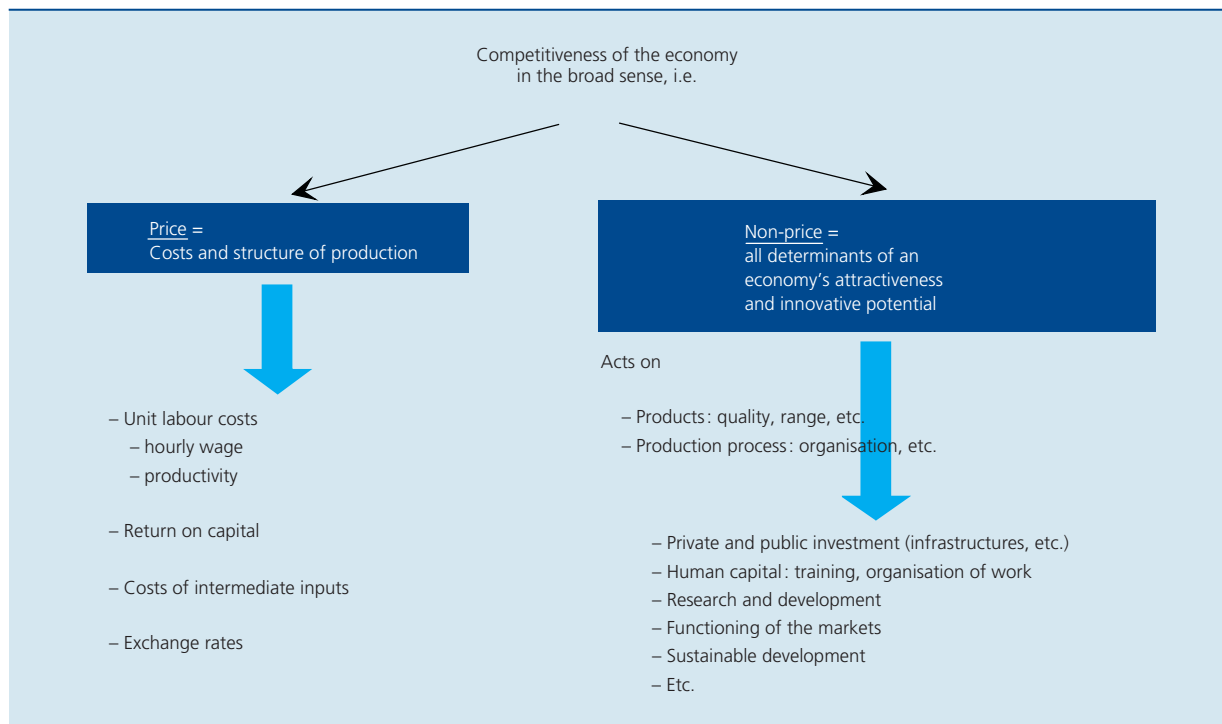– maintain a similar production environment to that of economies of a comparable developmental level (level playing field), so as not to compound the situation with comparative handicaps in terms of production costs, tax, social and environmental regulations, infrastructures and networks;
– promote adaptability, insofar as underlying changes are inexorable. If this is to be achieved without compromising the efficiency of the goods and services markets, action is needed with regard to production factors and how they are implemented in order to enhance the economy's potential: R&D and innovation (physical capital, new methods of production and organisation, innovative products, etc.), human capital (initial and continuing training, entrepreneurial spirit, the functioning of the labour market, organisation of working hours, etc.);
– take this action while being mindful of all the social and environmental goals, aiming in particular to manage public finances soundly, maintain social welfare, take account of new needs and guarantee sustainable development.

Specifically, what is required is a concerted effort to mobilise all the available tools and policies at European, Belgian and regional level, so as to ensure the competitiveness of the economy.

2.1 Conditions for a competitive economy

While the competitiveness of an industry branch is seen as its capacity to defend or gain market shares, the competitiveness of the economy as a whole lies in the ability to ensure the development of overall productivity and, by

CHART 13   PRICE AND NON-PRICE COMPETITIVENESS

Competitiveness of the economy
in the broad sense, i.e.

Price =
Costs and structure of production

Non-price =
all determinants of an
economy's attractiveness
and innovative potential

Acts on

– Unit labour costs
  – hourly wage
  – productivity

– Return on capital

– Costs of intermediate inputs

– Exchange rates

– Products : quality, range, etc.
– Production process : organisation, etc.

– Private and public investment (infrastructures, etc.)
– Human capital : training, organisation of work
– Research and development
– Functioning of the markets
– Sustainable development
– Etc.

extension, of future income ; according to the definition used in the EC's competitiveness reports, its aim is to ensure a sustained rise in a nation's standard of living and as low as possible a level of involuntary unemployment.

In fact, what we must do is look beyond the traditional notion of competitiveness as the ability to produce and offer goods and services on the market at a competitive price, and take a broader view. Price competitiveness, which is bound up with production costs, could then be the way for the Belgian economy to retain a role in an increasingly international production system within which it is mainly in direct competition or partnership with its neighbouring countries. Price competitiveness is determined by per capita labour costs and labour productivity, which together dictate the unit labour costs of production, and return on capital, on top of which there are the costs of intermediate inputs and the impact of exchange rates. Meanwhile, the other, more intangible factors – which can be called qualitative or non-price competitiveness – together determine the attractiveness of an economy and its innovative and adaptive potential, through the quality and variety of products available and the organisation of production processes. Put simply, price competitiveness is playing a more defensive role, preserving the attainments, whereas non-price factors have more to do with an offensive strategy motivated by the need to adapt to a global and fast-changing environment. These factors include the volume and quality of capital

stock, including infrastructures, the volume and training of human capital, the organisation of labour, R&D efforts, the appropriate functioning of the product and factor markets. Ultimately, of course, non-price competitiveness has a bearing on price competitiveness, by augmenting the productivity of labour or lowering the cost of transport or capital. It seems to have become indispensable, especially insofar as it relates to knowledge – the foundation of the Lisbon strategy. In fact, in the globalised environment in which we now live, knowledge has become "the rare factor of the production function, as capital and technology are completely mobile" (Delanghe et al., 2004).

In section 2.2, the main conditions of innovation and adaptive capacity will be reviewed. First, the two aspects of competitiveness will be looked at in general terms, by highlighting Belgium's position and that of industry in particular.

2.1.1 Price competitiveness : constituents of production cost

Belgian industry is characterised by high labour costs, although in recent times the cost trend has been neutral, if not to say slightly favourable. An international comparison of wage levels requires a certain restraint towards statistical information as regards the degree of harmonisation of data and because of the influence of the sectoral structure and the composition of employment in each country. Clearly, however, Belgian industry's hourly

labour costs are among the highest in the EU-15, due mainly to additional charges[1]. These account for 91 p.c. of gross direct compensation, one of the three highest rates of the EU-15 along with Italy and France. The Scandinavian countries' labour costs are close to or higher than Belgium's, albeit because they have higher gross compensation. As for the four main NMS, their labour costs are significantly lower – almost 30 p.c. lower than Portugal's, the EU-15 country with the lowest labour costs.

Regardless of the high level of wages, their development in Belgian industry has been fairly restrained over the last five to seven years. Between 1997 and 2002, the average annual growth of 3 p.c. in industrial wages was less pronounced in Belgium than in the majority of the EU-15 countries, and France and the Netherlands in particular where industrial wages grew by 0.6 and 1.3 percentage point faster each year. It was, however, somewhat higher than in Austria and Germany, by 0.4 and 0.6 percentage point respectively. That said, productivity gains more than offset the rise in wages such that, between 1997 and 2004, unit labour costs rose by just 0.1 p.c. a year, way below the pace in the Netherlands (1.8 p.c.) but faster than in Germany, where they contracted by 0.3 p.c. a year, and in several countries, France and
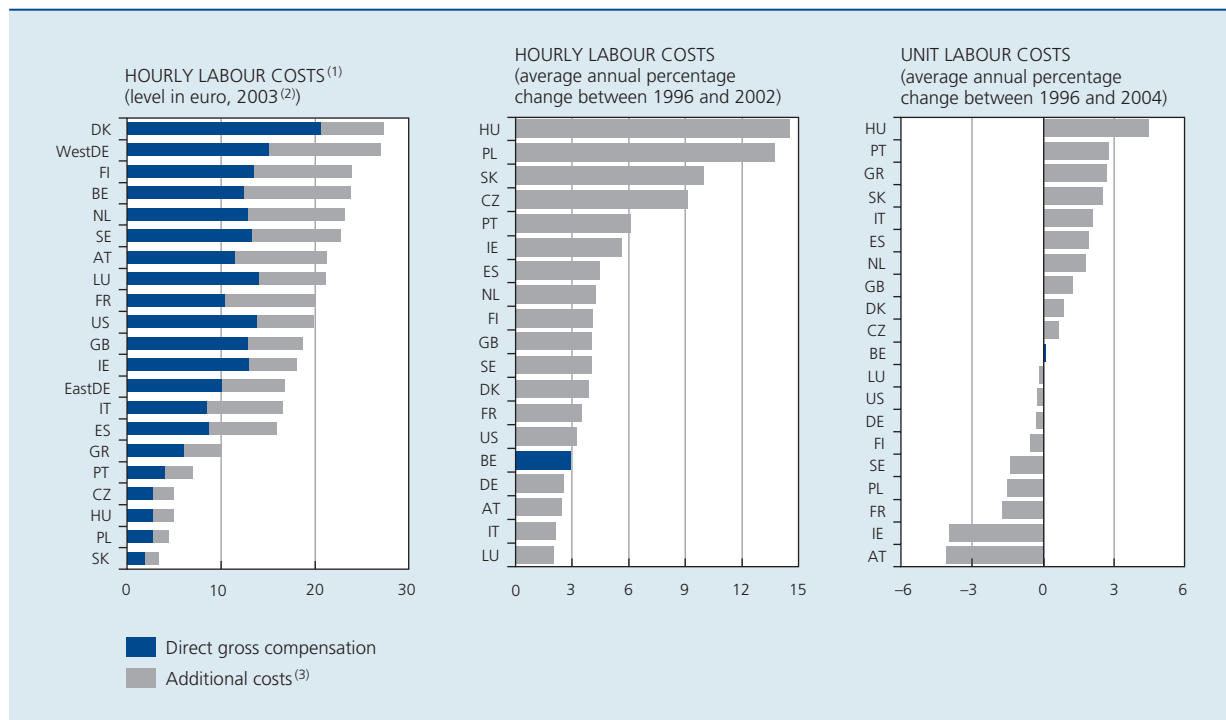
Austria included, where they substantially fell. Moreover, in the four largest NMS, the development of unit labour costs has been patchy, under the combined influence of substantial rises in hourly labour costs and productivity[2]. While unit production costs in industry would have shrunk in Poland and moderately risen in the Czech Republic, they would have increased markedly in Slovakia and, at 4.5 p.c. per annum, even more so in Hungary. All of which serves as a reminder that the convergence process upon which these economies have embarked is helping to gradually bring their wage and productivity levels into line with those of the EU-15 countries, perhaps further eroding their competitive advantage in terms of production costs.

In Belgium, since 1996, despite hourly wages having grown faster in industry than in the service branches, unit labour costs of production have risen far more slowly in industry. Yet production costs in services partly determine

(1) Social security contributions, incentive bonuses, holiday pay.
(2) These substantial changes in wages and productivity call for a circumspect view of the conclusions regarding unit labour costs, insofar as differences in measure or source in their two constituents can easily tip the balance in favour of an improvement or deterioration. Moreover, the development of the exchange rate must also be considered, which is not the case in chart 14, which is based on figures in local currency.

CHART 14   LABOUR COSTS IN INDUSTRY

HOURLY LABOUR COSTS[1]
(level in euro, 2003[2])

HOURLY LABOUR COSTS
(average annual percentage change between 1996 and 2002)

UNIT LABOUR COSTS
(average annual percentage change between 1996 and 2004)

■ Direct gross compensation
▉ Additional costs[3]

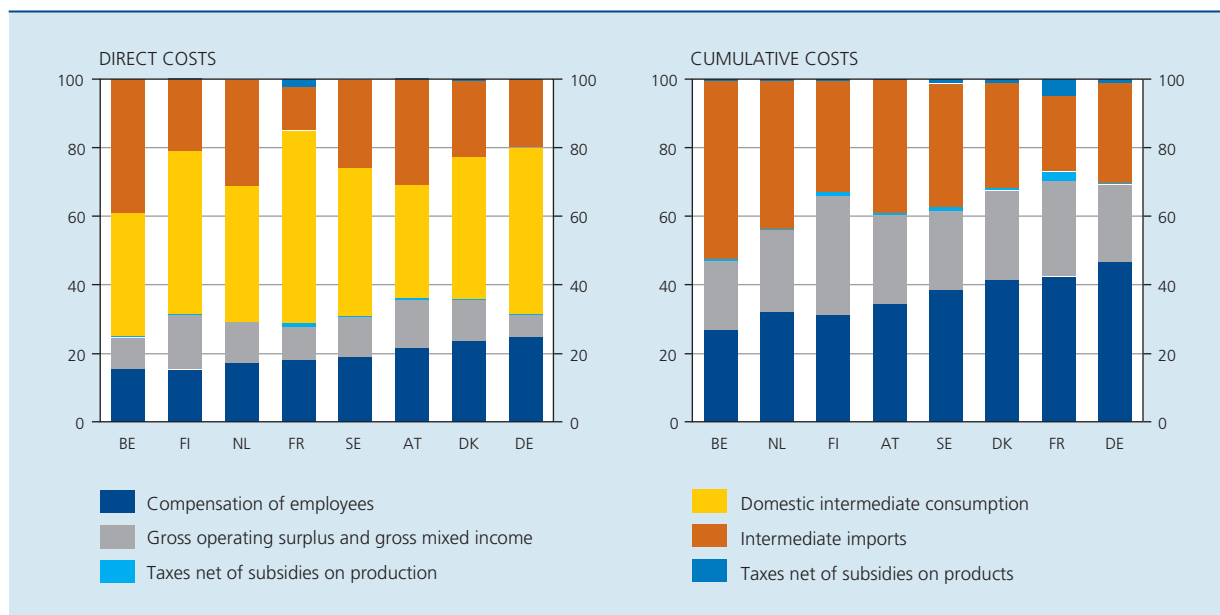Sources: EC, Institut der deutschen Wirtschaft Köln, OECD.
(1) Calculations based on national data, which are not always fully harmonised.
(2) Figures from 2002 for the four new Member States.
(3) Social security contributions, incentive bonuses, holiday pay.

CHART 15   STRUCTURE OF THE PRODUCTION COST IN INDUSTRY [1]

(Percentages of total, 2000)

DIRECT COSTS

CUMULATIVE COSTS

- Compensation of employees
- Gross operating surplus and gross mixed income
- Taxes net of subsidies on production
- Domestic intermediate consumption
- Intermediate imports
- Taxes net of subsidies on products

Sources : EC, NAI, NBB calculations.

(1) Figures based on the input-output tables. Here, industry is defined according to the concept used for the analysis of these tables. Countries are ranked in ascending order of the share of wages.

production costs in industry, insofar as the latter is an intermediate consumer of services. Generally speaking, there are still two stumbling blocks in terms of the development of labour costs : pay rises outside the framework of collective wage agreements, which propel the wage drift, must be constantly monitored and productivity gains must become much more widespread in the service branches in order to rein in unit labour costs.

Industrial companies' production costs are affected by factors other than the cost of labour, i.e. gross operating surplus and gross mixed income, which are representative of corporate profit and the income of the self-employed (which are relatively numerous in Belgium) and the costs of intermediate consumption, particularly imported, which is an especially large component in Belgium. In comparison with other European countries, it appears that in Belgium wages constitute the smallest share of the total cost of production in industry, based on either a direct comparison of labour costs with industrial output (15 p.c.) or the sum of industrial wages and wages in the other upstream branches, i.e. after incorporating the structure of domestic intermediate consumption costs (27 p.c.) [1].

(1) Generally speaking, the switch from direct costs to cumulative costs causes non-wage compensation to rise more sharply than wages, as it involves incorporating the value added of service branches, in which the income of the self-employed makes up a bigger share.

The lower share of labour costs in the cost of production in Belgian industry means that intermediate imports seem to have much more of a decisive influence than elsewhere ; yet they are a cost constituent over which Belgian companies have little control, notwithstanding the protection that is now afforded by monetary union in terms of fluctuations in exchange rates against the euro area partners. By way of comparison, in large, less open economies such as France and Germany, wages make up 42 and 47 p.c. respectively of cumulative production costs, against 27 p.c. in Belgium.

Energy is a particularly large component of intermediate production costs and is very sensitive to major price changes in the world's oil markets. Its share in the cumulative production cost of industry appears to be fairly high in Belgium : in 2000, intermediate consumption of products included in the energy branches (crude and refined petroleum products, production and distribution, etc.) accounted for 4.4 p.c. of the cost of industrial production in Belgium, compared with 3 to 3.5 p.c. for Germany, Austria and Finland and less than 3 p.c. in Denmark and France. However, it was even greater in the Netherlands, where it reached 5.3 p.c. Moreover, at almost two thirds the imported share of the energy cost was highest in the Netherlands and Belgium. In the majority of European countries, the importance of energy in the production process increased between 1995 and 2000 due to rising oil prices. Only Finnish and

CHART 16

**CHART 16   SHARE OF ENERGY IN THE PRODUCTION COST
IN INDUSTRY [1]**

(Percentages of total, 2000)
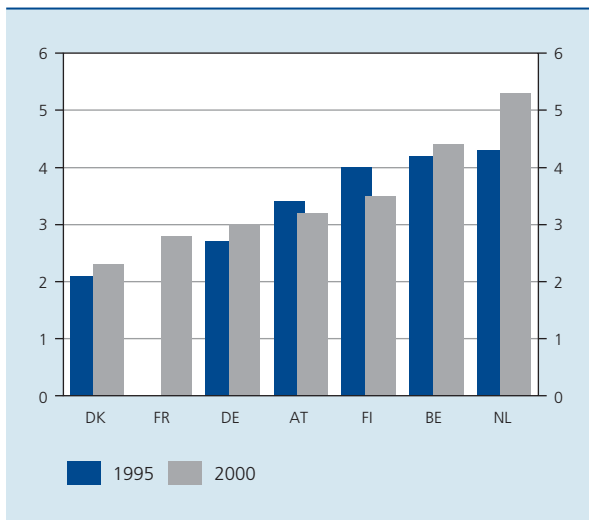
Sources : EC, NAI, NBB calculations.
(1) Figures taken from the calculation of cumulative costs based on the input-output tables. Here, industry and energy are defined according to the concept used for the analysis of these tables.

Austrian industry managed to reduce the relative size of their energy bill over this period.

2.1.2 Other competitiveness factors and synthetic view

By its very nature, non-price competitiveness has many facets, the main ones of which will be examined in the following section. However, thanks to international rankings prepared by some institutions, the overall competitive position of the Belgian economy, or a subset of it, can be assessed synthetically. Hence, the IMD [1] rankings combine quantitative elements, including price competitiveness, with qualitative elements, compiled using the results of an annual opinion poll of managers of multinational companies. In 2005, Belgium was ranked 24th out of the 60 countries and regions analysed, with an index score of 67.5 (United States = 100) and tenth among the EU-15 countries. It has therefore dropped six places compared to the 2003 ranking, due mainly to the progress made by other countries. In terms of qualitative elements, Belgium was given a positive assessment for its infrastructure and international openness, and a negative assessment in terms of taxation (especially of natural persons), its institutional and legal framework as well as its labour market.
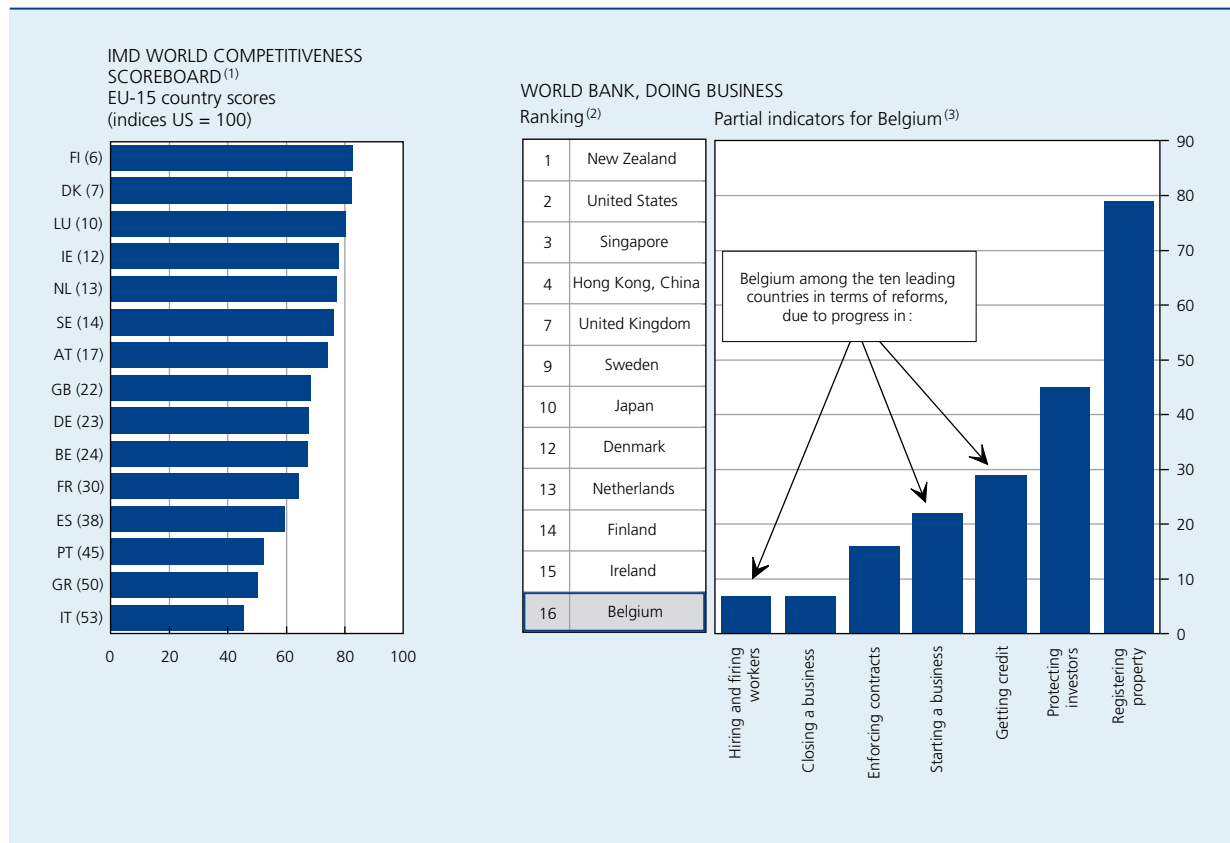
The indicator calculated by the World Bank, which is based solely on non-price elements, gives a more positive image of the regulatory environment in Belgium. Since 2003, this institution has published an annual report entitled "Doing business" based on an in-depth study of the legal and regulatory framework, as well as the actual reality in which firms operate. In contrast to the IMD, which surveys the managers of multinational companies, the World Bank study focuses on the environment facing SMEs, which represent a vital part in the economic fabric in Belgium. In the most recent edition of the report (World Bank, 2004), Belgium is ranked 16th out of the 145 countries making up the study as well as figuring among the 10 countries to have introduced most reforms in 2003, notably in the areas of starting a business (one-stop shop), hiring and firing workers (service vouchers) and getting credit (positive central credit office). Generally speaking, the World Bank notes that the main reforms in 2003 took place within the EU, either in the NMS or in the old Member States, through the impetus given by the NMS.

The non-price competitiveness of an economy can also be generally expressed in the capacity shown by its products to be present on buoyant international markets. The structure of Belgium's foreign trade can thus be compared with the degree of dynamism exhibited by export markets. During the period 1995-2002, it would seem that Belgium's export structure was favourable for 44 p.c. of total exports and unfavourable for 56 p.c. This latter percentage includes regressive products – i.e. products for which the rise in foreign demand is low – in which Belgium specialises (primary plastics products, iron and steel, etc.) and progressive products in which it does not specialise (technological products such as electrical machinery and apparatus, office, automatic data processing and telecommunication equipment and apparatus, etc.). Taking account of the weighting of products in Belgium's trade, the foreign trade structure by product impacted slightly negatively on the growth of Belgium's export markets between 1995 and 2002, in contrast to the three neighbouring countries where this structural effect had a positive effect.

(1) Institute for Management Development.

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CHART 17   SYNTHETIC INDICATORS OF COMPETITIVENESS

IMD WORLD COMPETITIVENESS
SCOREBOARD[1]
EU-15 country scores
(indices US = 100)

Country	
FI (6)	
DK (7)	
LU (10)	
IE (12)	
NL (13)	
SE (14)	
AT (17)	
GB (22)	
DE (23)	
BE (24)	
FR (30)	
ES (38)	
PT (45)	
GR (50)	
IT (53)	

0   20   40   60   80   100

WORLD BANK, DOING BUSINESS

Ranking[2]

1	New Zealand
2	United States
3	Singapore
4	Hong Kong, China
7	United Kingdom
9	Sweden
10	Japan
12	Denmark
13	Netherlands
14	Finland
15	Ireland
16	Belgium

Partial indicators for Belgium[3]

Belgium among the ten leading
countries in terms of reforms,
due to progress in:

Hiring and firing workers — Closing a business — Enforcing contracts — Starting a business — Getting credit — Protecting investors — Registering property

Sources: IMD (2005), World Bank (2004) and own calculations.
(1) The number in brackets refers to the position in the global ranking, based on 60 countries and regions analysed.
(2) EU-15 countries ranked higher than Belgium and selection of other countries. Those EU-15 countries not included in the table are ranked lower than Belgium.
(3) The chart shows, for each category, the average rankings achieved by Belgium in 2003 for all of the category indicators. In theory, the average is between 1 and 115, a lower number conveying a better ranking.

TABLE 5   EFFECT OF THE FOREIGN TRADE STRUCTURE

(Development of markets compared to trade of the EU-15, 1995-2002, indices 1995 = 100)

	Markets weighted geographically and by products	Markets weighted geographically	Effect of the structure by product[1]
Belgium	131.7	132.3	99.5
Netherlands	131.7	127.9	102.9
France	140.4	131.6	106.7
Germany	137.0	134.0	102.3
p.m. Three main neighbouring countries[2]	*136.8*	*131.5*	*104.1*
Italy	127.2	129.9	97.9

Sources: EC, NAI, NBB.
(1) Ratio between the 1st and 2nd columns. A result greater than 100 indicates that the structure by product is favourable.
(2) Weighted average by extent of trade.

2.2 Elements of the economic development potential

To a large extent, the elements determining the non-price competitiveness of the economy, namely its capacity to develop and adapt, are the same as the factors influencing its growth potential. Consequently, they can be linked either to capital stock, labour or total factor productivity, i.e. the effectiveness with which the factors are combined in the production process.

2.2.1 Capital stock

Capital stock, which is the economy's total production capacity, is constantly changing and it is essential that the rate of private and public investment is such that the capital stock can be replenished both in qualitative terms, by integrating new technologies, and quantitative terms, beyond the routine replacement of depreciated capital.

One feature of the Belgian economy is its relatively high level of private non-residential investment compared to many European countries. This can be compared with the assertion already made regarding the extent of capital intensity

and, as a result, strong apparent labour productivity. Moreover, although Belgium does not specialise in ICT production, it has one of the highest rates of ICT investment in the EU-15, due to office automation and information technology equipment. Using these technologies does admittedly help increase labour productivity as production factors, i.e. capital and labour, are combined more effectively.

In contrast to the situation in place for private investment, the Belgian economy is characterised by the weakness of public investment which is clearly below the European average, both in gross and net terms. Hence, between 1990 and 2003, net public investment was zero on average, which means that gross investment merely offset the depreciation of the existing capital. During the same period, annual net public investment amounted to 0.9 p.c. of GDP in the EU-15. With the rate of net investment remaining at zero, recent evidence, since 2000, leads to the same conclusion.

This represents a major obstacle to the future development of the economy insofar as the private sector is unable to undertake certain investments on the one hand while on the other, combined public and private

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CHART 18   INVESTMENT

(Percentages of GDP)

PRIVATE NON-RESIDENTIAL INVESTMENT (constant prices)

GROSS PUBLIC INVESTMENT

■ 1990-2004 average
■ 2000-2004 average

ICT INVESTMENT[1]

NET PUBLIC INVESTMENT

■ 1990-2004 average
■ 2000-2004 average

■ 1990-2003 average
■ 2000-2003 average
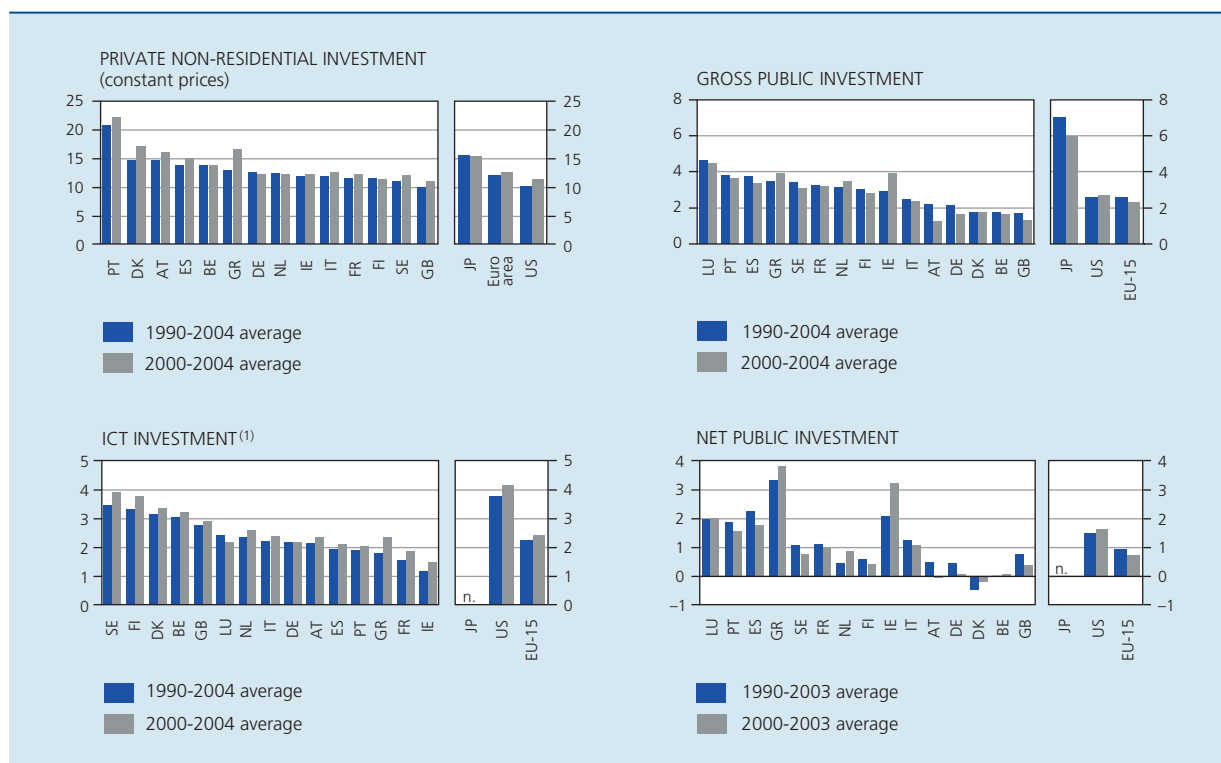
Sources : EC, GGDC, OECD.

(1) Includes office automation and information technology equipment, communication equipment and software.

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efforts may give rise to ripple effects and a virtuous circle. Insufficient public investment can therefore jeopardise the economic infrastructure, especially the transport and communication network which is one of the factors which makes our economy attractive, and which appears to be a condition for the performance of the most dynamic regions (cf. infra).

2.2.2 Human capital

The dynamism of an economy, especially where the wish is for it to be knowledge-based, also lies in the skills and potential of its labour force. Human capital proves to be a key factor for potential growth in several respects : in quantitative terms via the supply of labour, in qualitative terms via initial and continuing training, and through the effective organisation of labour.

As far as quantitative factors are concerned, the low participation rate, particularly of the oldest workers, and the continued high level of unemployment are well-known shortcomings of the Belgian labour market. They are a burden on the economy's employment rate, one of the lowest in the EU-15. In addition to the number of persons employed, the working time also influences the supply of labour. In this regard, the average number of hours worked per week in Belgian industry is noticeably less than that for the EU-15 (36.8 hours compared to 38.5 in 2003). This is largely explained by a shorter full-time working week [1] ; in fact, although recourse to part-time work is more common in Belgium than elsewhere, it takes

the form of a longer working week in Belgium [2], in such a way that, overall, when compared with the EU-15, the weekly time spent in part-time work is only 24 minutes longer. In Belgium, as in most of the other countries, the average working time is greater in industry than in the economy as a whole as recourse to part-time working is not as great, the full-time hours worked, incidentally, being less.

The poor matching of labour supply and demand is another structural problem of the labour market in Belgium. In an attempt to remedy this, the High Employment Council recommended the implementation of the necessary conditions for greater geographical, sectoral and professional mobility among workers and improved access to both initial and continuing training.

As far as this qualitative aspect of human capital is concerned, Belgium is very well positioned in terms of initial training, with a high rate of people holding a higher secondary certificate (82.1 p.c. of young people aged 15 to 24 in 2004), close to that of the European countries performing best in this respect. Yet the rate of people holding higher education certificates in science and engineering subjects, from which the leading R&D employees are recruited, appears to be too low. In 2001, this group

(1) The measure used here, namely hours actually worked, is subject to the influence of temporary unemployment. With regard to the Belgian economy as a whole, the average working time is also less than that of the EU-15 but the difference is smaller than for industry due to the narrower gap in the average full working time (40.2 hours in Belgium compared to 40.6 in the EU-15).

(2) In 2003, Belgian industry ranked 2nd and 3rd respectively for these two criteria.

TABLE 6   VOLUME OF LABOUR

	Belgium	EU-15	Top 3 of the EU-15
Employment rate of the economy (harmonised data, 2nd quarter of 2004, in percentages of the population of working age (15-64 years), unless otherwise stated)			
Participation rate	65.3	70.3	78.2 (DK-SE-NL)
Unemployment rate [1]	7.4	8.4	4.6 (IE-GB-NL) [2]
Employment rate	60.5	64.5	73.8 (DK-NL-SE)
Idem, 55-64 years	30.1	42.3	62.3 (SE-DK-GB)
Working time in industry (hours actually worked per week, unless otherwise stated ; 2003)			
Full time	38.2	39.9	41.7 (GR-IT-GB)
Part time	23.5	19.8	23.7 (IT-FR-BE)
Proportion of part time [3]	9.1	7.0	9.2 (DE-BE-SE)
Total average time	36.8	38.5	40.5 (GR-IT-LU)

Source : EC (labour force surveys).
(1) As a percentage of the labour force.
(2) Three countries in the EU-15 with the lowest unemployment rate.
(3) As a percentage of the number of jobs.

TABLE 7   INITIAL AND CONTINUING TRAINING

	Belgium	EU-15	Top 3 of the EU-15
Initial training			
Proportion of 20-24 year olds with a higher secondary certificate (percentages, 2004)	82.1	73.5	85.6 (SE-AT-IE)
Proportion of 20-29 year olds with a scientific or technical certificate (percentages, 2001)	1.01	1.19	2.05 (IE-FR-GB)
Continuing training of the population (percentages, 2003)			
Proportion of 25-64 year olds been having been in education or having undergone a training course during the four weeks prior to the survey	8.5	9.7	24.8 (SE-GB-DK)
Continuing training in industry (1999)			
Proportion of training enterprises[1], formal and informal training[2] (percentages)	68	56	92 (DK-IE/NL/SE)
Participation rate in formal training within training enterprises (as a percentage of the number of workers)	53	42	56 (SE-BE-FI)
Number of hours of formal training per participant	29	32	47 (GR-LU-ES)
Total cost of formal training (as a percentage of total wages)	1.5	1.9	2.9 (GB-DK/IE/SE)

Source : EC.
(1) Firms having organised at least one training course during the year preceding the survey.
(2) Formal training covers courses and work placements outside of the workplace, informal training covers all other training practices.

accounted for 1.01 p.c. of the population between the ages of 20 and 29 in Belgium compared to 1.19 p.c. in the EU-15 and over 2 p.c. in the top three European countries. One alternative would be to attract qualified personnel from abroad but at present the brain drain tends to be from Europe to the United States.

Continuing training is just as crucial as initial training, especially with regard to keeping older workers in employment. The most recent results available from the labour force survey show that, based on 2003, the continuing training effort in Belgium is slightly below the European average, whilst falling a long way short of the most dynamic countries, namely the Scandinavian countries, the United Kingdom or the Netherlands. The CVTS (Continuing Vocational Training Surveys), which are conducted less frequently[1] than the labour force surveys, enable an in-depth analysis to be carried out of continuing training in the branches of activity. Despite indicating a considerable increase in the training practices within Belgian industry between 1993 and 1999, such practices appear to be unequally distributed among firms. The participation rate is thus relatively high among firms effectively offering formal training, namely in the shape of courses or placements outside of the workplace but the overall supply of formal training is average compared to other countries and it covers quite a small number of hours. However, this must be qualified by the fact

that continuing training is also organised on an informal basis, especially within industry, consisting of an on-the-job training. These practices, which are more difficult to measure, are likely to be more common in SMEs, of which there is an abundance in Belgian industry[2].

In Belgium, the social balance sheets indicate that formal training is more present in branches subject to rapid technological change, resulting in marked variations between branches of industry. Furthermore, in those branches where there is a lower proportion of low-skilled manual workers, it is noticeable that sectoral funds, in principle targeted at risk groups, are assigned to all workers. This might indicate a lack of general resources within firms. Finally, the formal training effort increases with the size of the firm. Hence, refined petroleum products and metallurgy figure among the three branches which, in 2002, had already reached targets in terms of budget (included in the interprofessional agreement of 1998) and participation in training, a target set by the Employment Conference of September 2003. In accordance with these targets, in 2004 the private sector as a whole should have earmarked 1.9 p.c. of personnel costs for training, and it

(1) The last dated survey is based on 1999.
(2) The study of Sels et al. (2002), based on a survey among Flemish SMEs, shows on the contrary that the SMEs which theoretically offer a large potential of on-the-job training on account of their organisation and the nature of their tasks, are also the enterprises which invest the most in formal training, especially in industry.

TABLE 8   ORGANISATION OF WORK AND WORKING ENVIRONMENT

(Percentages of the total number of jobs, 2003, unless otherwise stated)

	Belgium	EU-15 [1]	Top 3 of the EU-15
Temporary contracts :			
industry	5.7	8.4	13.8 (ES-PT-FI)
all firms	7.3	10.8	19.0 (ES-PT-FI)
Temporary unemployment [2] :			
industry	2.5	n.	n.
all firms	1.2	n.	n.
Unsocial hours (all firms), people who normally work :			
evenings	13.5	17.6	26.9 (GB-GR-FI)
nights	4.2	7.3	10.1 (GB-FI-AT)
Shift work (all firms)	9.6	15.8	22.7 (FI-SE-IT)
Work accidents [3] in industry (2000)	4	4	7 (ES-PT-NL)
Workers who are victims of intimidation (economy as a whole, 2000)	11	9	14.3 (FI-NL-GB)

Sources : EC (labour force surveys), NAI, NEMO.
(1) Weighted average for temporary contracts; non-weighted average, for 11 and 13 countries respectively, for unsocial hours and shift work.
(2) Number of people receiving temporary unemployment benefit as a percentage of the number of salaried employees.
(3) Having resulted in at least four days' absence.

ought to attain a participation rate of 50 p.c. by 2010. Insofar as these are overall targets, a parallel can be drawn in this respect with the target of 3 p.c. of GDP for R&D spending (cf. infra). While this latter factor does not guarantee the spread of knowledge and innovation, training targets, even if adhered to by the private sector as a whole, do not ensure that training efforts will be allocated in a harmonised manner. One considers, in particular, the many SMEs operating in our economy, whose size appears to represent an obstacle in gaining access to formal training.

Irrespective of the volume of work and the labour skills deployed, the potential of human capital also depends on work being organised in an effective manner. Beyond the high level of apparent labour productivity in Belgian industry, this organisation can be looked at with the aid of some partial indicators.

Generally speaking, in all of the EU-15 countries, temporary work is less common in industry than in firms as a whole and this difference is even greater in Belgium : 5.7 p.c. of industrial jobs in Belgium are temporary contract positions compared to an average of 8.4 p.c. in the EU-15 and 7.3 p.c. in firms as a whole in Belgium (10.8 p.c. in the EU-15). Here, a lesser importance of seasonal work is in evidence, as is the need for industry to have staff trained in the specific production techniques of each

branch. This preference for a stable workforce is underlined by the temporary unemployment figures – only available for Belgium – inasmuch as industry is affected by the latter to a greater extent than the broad mass of branches[1]. It would therefore appear that industrial firms prefer to use this practice rather than parting with trained staff or resorting to temporary labour. Within the industrial sector, temporary unemployment affects the diamond and clothing branches in particular, which reveals a certain degree of vulnerability to economic conditions.

In terms of unsocial hours, so-called in line with the terminology of the EC's labour force surveys, it is evening or night work, as opposed to weekend work, which appears to affect industry in Belgium more than it does the other branches. At European level, where only figures for firms as a whole are available, it is noticeable that unsocial hours, whatever form they take, are less common in Belgian firms than their counterparts in most of the other EU-15 countries. The same is true of shift or teamwork : in Belgium, this is more common in industry than in firms as a whole, in the same way as variable working time or flexitime are less common. However, shift work in firms as a whole is less common in Belgium than in most other countries of the EU-15.

(1) However, much less than the construction sector.

A safe and untroubled working environment also helps to ensure that the production process runs smoothly, especially in industry where the risks involved may be greater. In this respect, and as far as one can judge, Belgian industry generally ranks at the European average in terms of work-related accidents or risks perceived by workers. Both in Belgium and in the EU-15, the construction, agriculture and transport branches appear to be more at risk. However, the dispersion within industry is considerable. Yet some branches where there are significant objective risks, such as the refined petroleum products branch, the nuclear industry and chemicals, are less dangerous, whether it be in terms of hard and fast statistics or according to workers' perception. This is obviously a result of the security measures taken.

Pressure in the workplace certainly exists since, in the EU-15, 36 p.c. of those employed in industry are permanently or almost always subject to strict deadline constraints, as against 29 p.c. for branches as a whole. Finally, although complaints of harassment are less common in the area of industry (6 p.c. of workers in 2000 compared to an average of 9 p.c. in the economy as a whole) in the EU-15, they are, as far as the economy as a whole is concerned, more widespread in Belgium than in the EU-15. This does not necessarily mean that harassment is more prevalent, but perhaps that there is a greater awareness of the phenomenon, resulting in a greater number of complaints.

2.2.3 Research and development

Research and development (R&D) plays a crucial role in maintaining and increasing competitiveness, allowing new products and production processes which are more efficient, less costly and more respectful of societal constraints to be developed. In so doing, it ensures that the economy is dynamic and attractive by adopting a long-term approach. It gives rise to the development of new machines and technologies which perform better than those of the previous generation. Investing in these is important so as to maintain the competitiveness of the economy.

From implementing R&D to a concrete product or process application involves a large number of stages, for which a harmonised and consistent policy is required. Since the Lisbon and Barcelona European Councils in 2000 and 2002 respectively, R&D and innovation have been at the heart of the strategy aimed at making the EU the most competitive, knowledge-based economy.

However, Europe is not only struggling to catch up with the United States in this area but actually fell further behind in the second half of the 1990s. The overall shortage of funds earmarked for R&D stems

from a lesser involvement of the private sector, plus a lack of researchers and inadequate exploitation of results. Against this background, Belgium stands midfield among European countries, although it does exhibit some special features. The data currently show that total R&D expenditure (for which the European target is 3 p.c. of GDP by 2010) amounted to 2.2 p.c. in 2001, above the European average of 2 p.c., yet way short of the best performers, Sweden and Finland (4.3 and 3.4 p.c. of GDP respectively), as well as the United States (2.8 p.c.) and Germany (2.5 p.c.). Belgium has been catching up, however, this ratio recording a sharp increase in recent times: between 1998 and 2001, R&D expenditure expressed as a percentage of GDP grew at an average rate of 4.5 p.c., one of the highest in the EU-15. Even over a longer period (1993-2001), Belgian growth was considerably greater than that of the EU-15. Nevertheless, the target of 3 p.c. remains a long way off, whereas it has already been exceeded in the most advanced countries, namely Sweden and Finland. According to the FPB (Biatour et al., 2005), starting from the level of 2001, the annual growth rate in R&D expenditure required to meet the 2010 target is slightly greater than that recorded over the period between 1993 and 2001 (7.2 p.c.) but less than the rate (8 p.c.) recorded since 1995. Taking past performance

CHART 19   R&D EXPENDITURE BY SOURCE OF FUNDS
(Percentages of GDP, 2003[1])
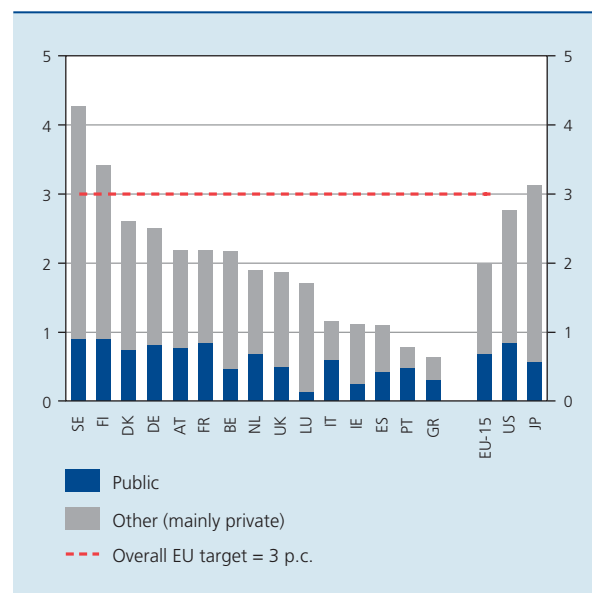
Source: EC.
(1) 2002 for Italy, Japan and the United Kingdom, 2001 for Belgium[1], Greece, the Netherlands and Sweden and 2000 for Luxembourg.

(1) According to unofficial figures from the Federal Science Policy Service, R&D expenditure is reported to have fallen in 2002 and 2003.

CHART 20   ROLE OF INDUSTRY IN R&D

(Percentages of industry in business R&D expenditure, 1997-2001 average[1])
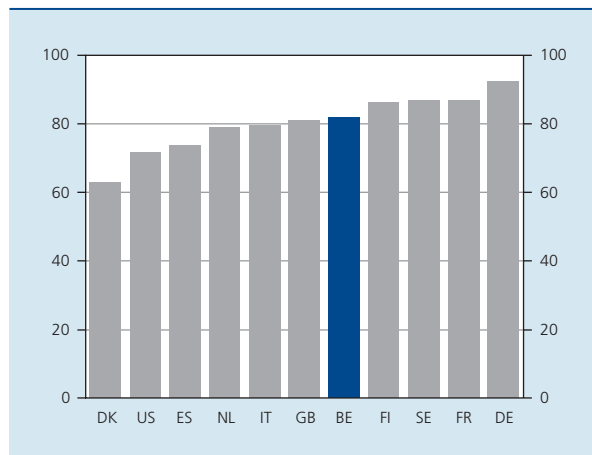
Source : OECD.
(1) 1997-1999 average for Denmark and 1997-2000 average for the United States, France and the Netherlands.

as a basis, the same study also estimates that the onus for achieving this target looks set to fall on the Flemish and Walloon regions, which will have to make up for the stagnation seen in Brussels.

In fact, based on the expenditure accounted for by firms, which amounted to almost three quarters of the total in 2001[1], the increase in R&D intensity between 1995 and 2001 was more marked in Flanders than in Wallonia, while no increase was recorded in Brussels. In relation to regional value added, the R&D expenditure of firms in 2001 totalled 2.2 p.c. in Flanders, 1.7 p.c. in Wallonia – a ratio close to the national average of 1.8 p.c. – and 0.7 p.c. in Brussels.

Under the terms of the Barcelona European Council, two thirds of R&D funding should come from the private sector. This is already more or less the case in Belgium, especially if foreign funding, the majority of which is private, is taken into account. However, a major effort is still required from the private sector if it is to achieve its implicit target of 2 p.c. Furthermore, whereas the EU is suffering generally from a shortage of private funding compared to the United States, in Belgium there is a lack of both execution and funding at government level; in 2001, the State's share in funding was the second lowest in the EU-15. The public funding of R&D expenditure is also influenced by the institutional development of Belgium where the regions are gradually supplanting

(1) To which must be added expenditure in other sectors, in particular higher education.

federal government. On the other hand, Belgian R&D benefits from a high level of foreign involvement which, in relation to GDP, ensures one of the highest contributions in the EU-15.

The nature of its activity means that industry is the main pillar for R&D. This applies even more so in Belgium because of the relative weakness of public involvement. Nevertheless, compared to other countries, the intensity of the R&D effort can appear insufficient : in relation to industrial value added, it amounted on average to 6.5 p.c. between 1997 and 2001, a level above that of the Netherlands, Denmark and the United Kingdom, yet below that of France and Germany. This overall view is misleading, however, since an analysis by industrial branch reveals that, in all of the branches except transport, the R&D effort is greater than in these last two countries. The difference observed at aggregate level can therefore be explained in terms of the transport equipment branch alone. In fact, this branch tends to be very active in R&D in the major countries, due clearly to its aeronautical, rail and automotive design activities, whereas Belgium is more oriented towards assembly.

Among industrial branches, the predominance of chemicals, and more particularly pharmaceuticals, is once more felt. During the last ten years, R&D expenditure by the pharmaceutical industry has grown twice as quickly as expenditure by firms on the whole, bringing its share of

CHART 21   SCIENTIFIC PATENTS

(Number of patents[1] per million inhabitants, 2002)

EPO
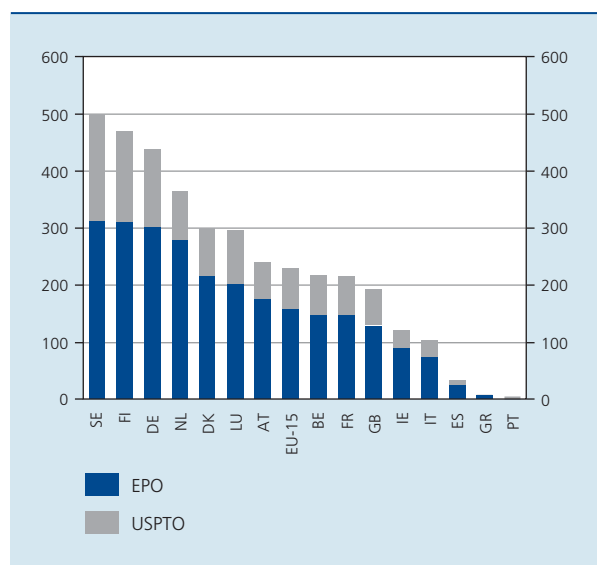
USPTO

Source : EC.
(1) Patent applications to the European Patent Office (EPO) and patents granted by the US Patent and Trademark Office (USPTO).

the total above 20 p.c. in 2001. This focus on one sector (which, furthermore, is highly dependent on foreign countries owing to the number of multinationals operating in Belgium) may in future prove to be a danger. In particular, it will be instrumental in meeting the Barcelona target. However, the branch with the most intensive R&D effort in relation to its value added is electrical and optical equipment: in 2001, this amounted to 24.7 p.c. compared to 17.8 p.c. for chemicals and 7.7 p.c. for industry as a whole.

R&D expenditure alone is not enough; what matters is that it can be translated into results and concrete applications, assessable in several stages. At the scientific level, the number of publications in Belgium is slightly above the European average. However, despite increasing rapidly in recent times, there is a shortage of patent applications in our economy. On the other hand, the Belgian economy is well positioned in terms of innovation, especially in industry. According to the EC innovation survey, half of the companies with 10 or more employees are reported to have innovated a product and/or process during the period 1998-2000. This performance is second only to Germany. Even though the high level of scientific research appears to be struggling to produce patented applications, innovation is nevertheless present.

In the final report to its work, "Belgium's High Level Group 3 %" (2005), set up in 2004 by the federal minister responsible for scientific policy, strongly qualified the usefulness of the 3 p.c. target for a small, open economy such as Belgium, R&D having "become a movable production factor over time". It also called into question the distribution target between the private and public sectors, modelled too much on the American situation, assessing that, in reality, the lion's share of efforts should be the responsibility of the private sector while also underlining the insufficient amount of public research. According to the High Level Group, the main problems of R&D in Belgium go beyond the figure of overall expenditure. As far as the deployed resources are concerned, besides the shortage of public funds already highlighted, the concentration of private expenditure in the hands of a limited number of multinational companies means that they are susceptible to one-off events, such as one company's decision to relocate. Moreover, although there is a highly-skilled workforce to support R&D in Belgium, the cost of such a workforce is too high and a career as a researcher is not attractive enough. In terms of opportunities, research results are not translated into innovations in a sufficient enough manner and the dissemination of these results is inadequate owing to a framework which is generally too rigid. The gap between the high-tech focus of R&D and the specialisation of Belgian industry in the

low and medium-tech segments is particularly illuminating in this respect. Finally, as regards innovation policies, the High Level Group highlights the risk of dual fragmentation: between different policies (a risk which also exists in other countries) but also in institutional terms where regional initiatives lack a common vision monitored at federal level.
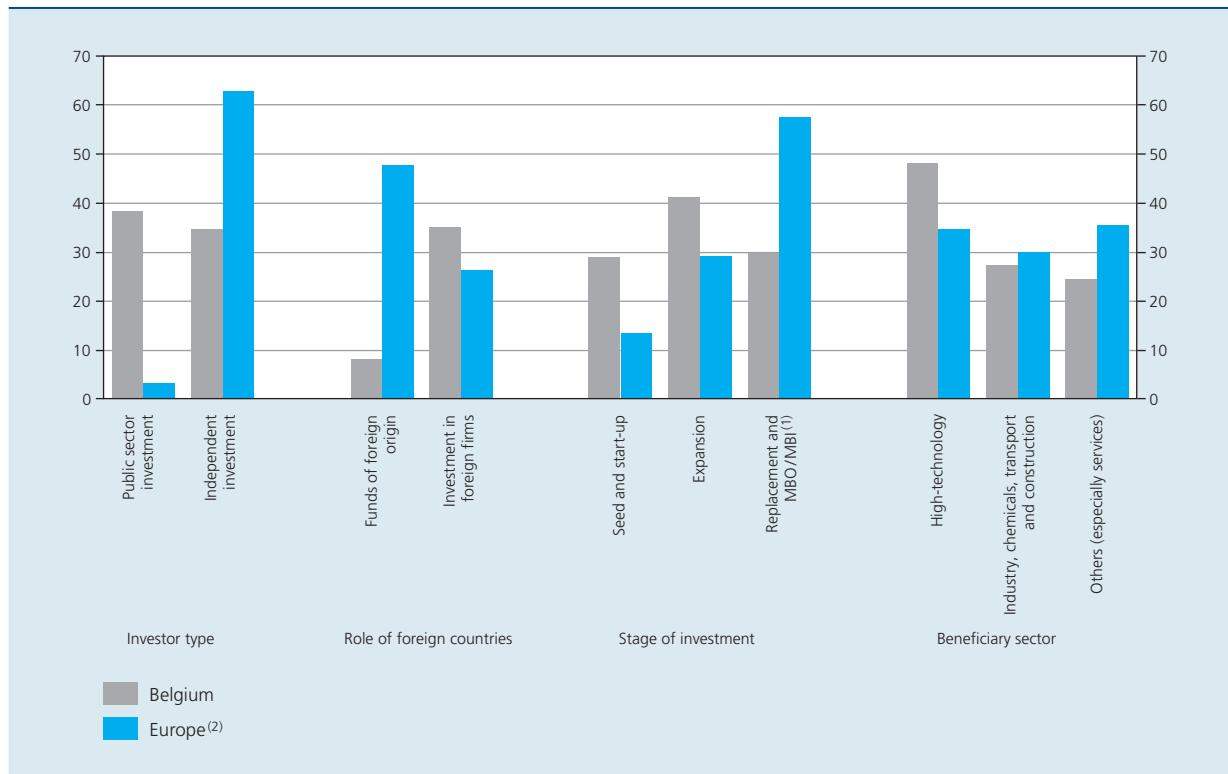
2.2.4 Financing of firms

In addition to the real factors mentioned above, the performance of both our industrial and non-industrial firms also implies that a certain number of financial conditions are fulfilled. Indeed, it is essential that their financial soundness is ensured and that they generate a sufficient amount of own resources, while at the same time having access to external funding which is varied and tailored to their situation. In this respect, there are a number of distinctive characteristics to Belgium's industrial fabric, and Europe's too, which should be taken into account. The recent past shows that Belgian firms are generally in good financial health and that their debt levels are reasonable. In 2001, equity accounted for roughly 40 % of the liabilities side of the balance sheet of Belgian industrial companies, thus placing Belgium midfield in relation to the other EU-15 countries. As is the case in the euro area as a whole, the financial accounts indicate that shares, the overwhelming majority of which are unlisted, provide the basis for a good 50 % of funding. An increasing proportion of shares are now held abroad. Moreover, the financing conditions do not appear to be unfavourable either and are not liable to slow down the development of companies activity. In the recent past the relative level of lending conditions to SMEs has tended to increase. However, this was very likely the result of a catching-up exercise whereby Belgian banks moved into line with the prevailing conditions in other EU countries, a fact which is underlined by the ECB's harmonised rate survey.

In the context of increasingly close integration of European financial markets, a policy ensuring that Belgian firms and, in particular, the numerous SMEs and fledgling companies are adequately funded, must support the aim of an innovative and buoyant economy. There are few multinationals in the Belgian economy with access to the international financial markets. However, it is home to many foreign companies (with loans between affiliated companies representing a major form of funding) and its SMEs draw a large part of their funds from unlisted shares, while at the same time remaining dependent on loans from local banks.

CHART 22   VENTURE CAPITAL IN BELGIUM

(Percentages of the total, average funds invested 1999-2003)

Investor type   Role of foreign countries   Stage of investment   Beneficiary sector

Belgium
Europe[2]

Source : European Venture Capital Association.
(1) Management buy-out / management buy-in.
(2) EU-15 + CZ, HU, PL, SK + CH, IS and NO.

SMEs in particular should be in a position to access a whole range of funding methods; the necessary conditions to do this include the preservation of access to bank loans, the development of the venture capital market and the emergence of financial markets designed for smaller companies and with the task of providing a link from venture capital once a company has reached a certain stage of development. In this respect, the Belgian venture capital market exhibits several distinctive, potentially weakening, features in a European context. Firstly, even though it compares quite favourably with the European average, it remains modest in size, both in terms of funds collected or invested. Secondly, it is largely dependent on public funding, due, among other things, to the lesser importance of institutional investors who are subject to more rigorous investment constraints. Finally, while it focuses heavily, and indeed more so than elsewhere, on high technology, it has in the past concentrated on the initial stages of company development. This in itself is a positive factor yet it increases the risk of a subsequent vacuum. An orderly and targeted raising of the restrictions on institutional investors could help in meeting this

requirement, as could the putting in place of an organised market, a role which could be filled by the newly-created Euronext Brussels free market.

2.2.5 Environmental policy

Several international agreements aimed at reducing pollutant emissions reflect the growing awareness over the past few years of the need to contain the environmental cost of economic activity. The requirement for sustainable development, which also forms an integral part of the Lisbon strategy, has significant implications for the production methods of companies, especially those in the industrial sector. At first sight, it may therefore be seen as restricting and a source of additional costs. However, apart from representing the corporate world's fair contribution in response to the needs of society, it may also prove to be an opportunity. Insofar as this growing awareness tends to be shared at international level, an industry may find an innovative way forward in the development of more environmentally-friendly production techniques. Such techniques, which are then an innovative product

in themselves, can, if appropriate, be marketed abroad or used to improve or manufacture existing industrial products more efficiently, thereby providing innovative companies in this field with a new competitive edge. Moreover, the recent "Kok report" (2004) places a sustainable environment and the attainment of a leading position in eco-industry in particular, among the five policy areas requiring urgent action as part of the Lisbon process[1].

The environmental objectives naturally affect all economic players. Households therefore have an essential role to play in terms of waste policy, which accounts for two thirds of current environmental protection spending. Although the biggest forms of pollution are waste and water-related, the only accurate and recent figures available are for air pollution.

It is this last form of pollution which is of primary concern to industry. Its share in the total of the five types of pollutant emissions recorded[2], which ranges from 27 to 66 p.c. over the period from 1990 to 2001, is in fact greater than its share in value added (20 p.c.). Certain industries, such as the refined petroleum products branch, chemicals, non-metallic mineral products and basic metals, are particularly polluting. A cumulative approach, based on the input-output table, and which also takes account of pollution caused by intermediate consumption, shows that the most polluting products to manufacture are basic chemicals and iron and steel.

Some efforts have already been made: from 1990 to 2001, most types of emission were cut, sometimes substantially, albeit to a lesser extent in the industrial sector than for firms as a whole. Although these efforts are moving in the right direction, there is still a considerable way to go to achieve the European Gothenburg 2010 targets in terms of acidification and photochemicals. Furthermore, greenhouse gas emissions have increased since 1990 – less so in industry than for firms as a whole – distancing Belgium from its reduction target of 7.5 p.c. agreed upon in the Kyoto protocol.

Even though the targets of international agreements relate to emission volumes, the efforts made by industry may also be judged based on how its eco-efficiency changes. Eco-efficiency compares industrial activity with the pollutant emissions that this activity causes. From this

CHART 23   INDUSTRIAL AIR POLLUTION
(Percentages, 1990-2001)

Source: FPB.
(1) 1990-2001 average.
(2) Change between 1990 and 2001.
(3) Defined as output per unit of pollutant emissions.

viewpoint, the development is favourable: between 1990 and 2001, eco-efficiency for firms as a whole improved, from 17 to 107 p.c. depending on the type of pollution, including for greenhouse gases. This indicates that pollutant emissions have risen less sharply than activity, and have fallen in some cases. Eco-efficiency gains proved to be lower in industry. However, the performance of the most polluting industrial branches has been patchy, from excellent for chemicals, neutral to positive for basic metals and negative overall for refined petroleum products and non-metallic mineral products. In the refined petroleum products branche especially, although emissions have fallen, the reduction in activity has been even greater, resulting in an important loss of eco-efficiency.

The environmental spending of the economy as a whole is on the rise. The enterprises, for their part, have financed 59 p.c. of the national expenditure on environmental protection in 2002, against 53 p.c. in 1997. This growth only affected current expenditure whereas the share of environmental investments in their total investment remained stable. As for the most polluting branches, the share of environmental investments in overall investments is much greater than the average (between 4.4 and 6.1 p.c. compared with 1.8 p.c. for firms as a whole).

(1) One can also mention, by way of example, the automotive industry, which is the subject of an in-depth analysis in the EC's last competitiveness report (EC, 2004a). The widespread demand for less polluting vehicles should guide R&D and enable the EU to gain a comparative advantage in this respect by adopting a pioneering role, which will be essential in conquering the potentially enormous Chinese market for motor vehicles. Although R&D capacities in this area barely affect Belgium, it will be able to turn it to its advantage through its role as an assembler.

(2) Greenhouse gases, acidification, photochemicals, carbon monoxide, lead.

2.3 Industrial and innovation policies

Faced with rapid changes in the global economy, and the implications of such changes for industry and other sectors of activity in Belgium, there are a whole range of factors that can enhance the economy's adaptability, its competitiveness and its prosperity. In this context, government and the social partners are called upon to employ a wide array of instruments, while reconciling the action they take with all of the societal objectives. In particular, what is generally referred to as industrial policy must henceforth be regarded in terms of an integrated and consistent approach, encompassing for example, the formation of revenue, education, research and innovation, the orientation of public expenditure or the environment.

2.3.1 Concepts and development of industrial policy

In its traditional sense, industrial policy can be defined as using a series of instruments to support and promote corporate activity, indeed to steer the sectoral specialisation of the economy. Over time, the focus of industrial policy has changed and its sphere of activity has widened, both in Belgium and in the other countries of the EU, these developments being guided, to a considerable extent, by European bodies.

Protecting sectors in difficulty or furthering the development of sectors considered as promising was the aim of the sectoral policies of the 1970s and 1980s. However, because of the negative judgement passed on these policies, from 1990, a horizontal policy, centred around the framework of economic activity, R&D and adaptation to structural changes, was implemented at European level in order to put in place the necessary conditions in terms of EU competitiveness. Since the Lisbon summit in 2000, the importance of such factors as innovation, acquisition and dissemination of knowledge, including informal knowledge and knowledge integrated into human capital, as conditions for maintaining and increasing competitiveness, has been emphasised. This includes increasing research efforts, as part of a national or regional innovation system within which synergies are created between all of the players involved in the acquisition of knowledge and in the development and implementation of innovations, namely firms, workers and government. At present, priority continues to be given to the horizontal approach, in spite of a certain turnaround in 2002 as a result of which some Member States provided a reminder of the need to take account of specific branch features when defining policies.

In this framework, industrial policy must be seen in the broad sense, as the result of the interaction between different types of policy each with its own aim, involving a broad range of instruments. The shaping of the innovation policy is itself constantly being adapted. From now on, the focal point of this must be the setting-up of innovation systems where interaction creates, spreads and deploys new knowledge, therefore going beyond a linear process according to which R&D conducted in isolation leads to the development of innovative products and a competitive economy. It is beginning to emerge that innovation is not restricted to the fields of scientific or technological research, but that it can be placed at the core of all of the policies, including in environmental and social areas.

2.3.2 Lessons to be learnt from the experience of innovative economies

In the absence of a universally acknowledged miracle cure, analysing the experiences of what are deemed to be the most dynamic European economies can provide a wealth of lessons as part of a benchmarking process, even if it is unlikely that they can be transferred exactly as they are.

Among the countries of the EU, Finland is the most commonly-cited example of an innovative and buoyant economy, supported in particular by its telecommunications sector. However, one cannot speak of offensive sectoral policy insofar as, following a major economic crisis at the start of the 1990s, the Finnish economy aimed above all to implement a framework conducive to economic restructuring. This policy showed a clear willingness to attach vital importance to R&D and innovation, as well as to education, and was implemented by setting-up a national innovation system, providing a structured framework consistent with the innovation policy and possessing the following main features : establishing contact links between a large number of players, cooperation between the academic, research and entrepreneurial circles, the participation of SMEs, public bodies which centralise responsibility for defining, funding and continued assessing both applied and pure research programmes. This framework helped create a national consensus, with all of the players agreeing on the objectives to be pursued.

In addition to this national example, there are a number of European regions which are also particularly dynamic. Several studies have attempted to identify the best performers among the regions – i.e. those undergoing rapid development (disregarding any catch-up effect) compared to the average growth of the EU – and to isolate the causes of their success [1].

(1) Cf. EC (2003b) for example.

	Per capita GDP (purchasing power parities, 2002, indices EU-15 = 100)	Annual GDP growth (1999-2002, current prices)	R&D expenditure (percentages of GDP, 2001)	High-technology patents (per million employed persons, 2002)	Employment in industry (percentages of total, 2003)	of which high-technology
Oberbayern	144.4	3.8	4.65	456	22.9	2.3
Darmstadt	140.2	2.6	2.99	90	21.8	2.2
Baden-Württemberg	114.1	3.0	3.89	142	32.3	3.5
p.m. Germany	*99.4*	*2.1*	*2.51*	*95*	*23.0*	*1.9*
Île-de-France	160.9	4.0	3.36	157	11.2	1.5
p.m. France	*103.3*	*4.1*	*2.23*	*72*	*17.0*	*1.2*
Niederösterreich	89.0	3.1	0.66[1]	44	19.8	1.6
p.m. Austria	*110.4*	*3.4*	*2.07*	*49*	*19.3*	*1.7*
Finland	104.0	5.3	3.41	232	18.9	1.8
p.m. Belgium	*106.7*	*3.5*	*2.17*	*66*	*17.8*	*0.7*

Source: EC.
The regions of Darmstadt, Oberbayern, Niederösterreich and Île-de-France were highlighted by an EC study (EC, 2003b) as having shown recent exceptional growth, account being taken of their initial level of development.
(1) 1998.

The regions highlighted in this type of study each display specific characteristics, such as with regard to the type of production (mainly high-tech industry in Oberbayern, the preservation of a more traditional industrial presence in Baden-Württemberg, services in Île-de-France and London) or the importance of R&D activities (underdeveloped in Niederösterreich, the region around Vienna, unlike in Oberbayern). Nevertheless, certain common features are also evident:

– these regions include a major city, at the centre of a sophisticated communication and transport network;
– they promote entrepreneurial spirit and collaboration between universities and firms;
– they can generally boast of the presence of high-technology clusters;
– spillover effects have arisen, made possible by existing networks and the sharing of a common vision by all of the partners involved.

It also seems that the public authority has always played an active role, not just through putting framework conditions (transport, communication, low cost energy supply) in place, but also in assisting regional development and facilitating contact between different players so as to improve the synergies between them as part of an integrated approach. To this end, governments have often set up and piloted centres aimed at bringing together players from different backgrounds so as to ensure coordination of the regional strategy. The State's role as the (primary) user of innovations must not be forgotten either; neither is this role limited to traditional domains such as the defence industry, which, in France, has contributed to the dynamism of the Île-de-France region, where it is concentrated.

Any industrial and innovation policy needs to be constantly rethought and adapted. This is why the Finnish government is now considering how to prevent its economy from resting on its laurels and to prepare it to face up to the challenges in store. Included among its objectives to remedy present shortcomings are the need to diversify an economy which is too specialised, the switch from a policy deemed too technological and scientific to one which is centred more on innovation (marketing, etc.), especially in the social sphere (healthcare, welfare), measures to galvanise the entrepreneurial spirit, considered particularly low at the time being, and measures to make Finland more attractive to foreign investment and labour.

2.3.3 Main features of the industrial and innovation policy in Belgium

Although essentially the responsibility of the regions, industrial policy in Belgium is still largely based on a common vision, due to the past, the responsibilities assumed by the federal State and the European framework. In this respect, industrial policy in Belgium has generally evolved in a similar fashion to the rest of the EU, and its three main neighbouring countries in particular.

First of all, it seems to be an acknowledged fact that resorting to defensive-type sectoral policies must remain an exception and must be governed by strict rules. Therefore, providing provisional assistance to an activity in decline in an attempt to facilitate conversion to a new activity, whilst complying with community regulations, especially relating to competitiveness (state aid, etc.), is permissible. Furthermore, horizontal policies, such as the training policy, are suitable for enabling inevitable changes to be faced since they promote labour adaptability. Over the years, defensive sectoral policies have become much less important; what remains in terms of such policies is basically the responsibility of the regions.

The appropriateness of offensive sectoral policies, the aim of which is to promote the development of a sector or a business line considered to be promising, is a more keenly debated issue. Opinions on the issue are divided, depending on who is believed to be better placed to identify the sectors of the future – the markets or the government. Such a policy remains a reality all the same, both in France on the grounds of its interventionist tradition, brought back into fashion by the Beffa report (2005) which advocates the launch of "mobilising programmes for industrial innovation" and in Germany where the volume of sectoral aid (including defensive aid) has remained relatively high. In Belgium, offensive sectoral policies continue to pervade the policies initiated in the different regions of the country. Thus, the different regional policy declarations made in summer 2004 all stated the intention to support those sectors regarded as promising.

For more than a decade, most industrial policies have however been horizontal in nature. They either aim to set up a favourable framework for economic activity (infrastructure, organisation of product and factor markets, entrepreneurial spirit, innovation, etc.) or they influence the entrepreneur's decision-making parameters (taxation, investment aid, etc.) more directly. The reality in Belgium is that these policies are determined both by European regulations and the sharing of responsibilities among the different levels of power within a country, in such a way that each level contributes to the implementation of these policies.

The EU has an important role to play in the matter, especially in terms of driving structural policies. This goes for the Lisbon strategy, which covers innovation and knowledge, the labour market and social cohesion, as well as the environment. The EU is also playing a more active role by initiating and supervising major transnational infrastructure projects such as the trans-European network programmes (rail, electrical, broadband networks), setting standards (adopting the GSM standard for example),

entering into multilateral accords within the framework of commercial policy, and contributing to the funding of structural policies.

It is important for Belgium to play an active part in these European initiatives and, in particular, to feature in the major transnational programmes. Moreover, the overall effort of the Belgian government may be judged partly in terms of the level of public investment; however, as has already been mentioned, this is particularly low.

In terms of responsibilities, each of the entities, both federal and federate, has a role to play:
– the federal State influences the economy's price competitiveness through its income and taxation policies. Non-price competitiveness, for its part, can contribute to achieving compliance with a competition policy by developing competition authorities, improving the way in which the financial markets work and increasing public investment in its areas of responsibility, notably air and rail transport;
– the communities have a major role to play in the development of human capital and pure research, key factors for endogenous economic growth;
– the regions have a number of responsibilities which impact on the economic framework, notably the environment, town and country planning, mobility (public works, especially roads), applied research, training, supporting local government, the use of European Structural Funds and the development of certain areas, whether rural, neglected or urban centres. They can also encourage economic activity directly through aid, especially for investment and research purposes.

The government therefore has a whole range of instruments to create an environment conducive to economic activity, but which does not necessarily require the mobilisation of considerable financial resources. Public action must be ongoing in order to best adapt regulations and the decisions resulting therefrom to a changing context and to the characteristics of the regional, national and European economy. However, the role of government must extend beyond the general framework. Hence, some of the best performers among European regions have benefited from active government support, in particular through the setting-up and piloting of meeting points between the players affected by the development of innovation poles (universities, research centres and firms). Achieving a national consensus based on a common vision of the goals and the resources to be used to get there guarantees maximum efficiency, especially in terms of the spillover effects from one innovative activity towards others or to the economy as a whole.

Of the three neighbouring countries, it is in the Netherlands that corporate policy is integrated to best effect, a number of responsibilities being brought together under the Ministry of Economic Affairs. In 2003, a detailed analysis was also carried out in order to assess the current state of the national innovation system, and on this basis several guidelines for the future have been worked out. In the two other countries, the systemic approach has been further developed at regional level. In France, a major networking policy has been developed by setting up clusters, known as "Systèmes productifs locaux", followed by competitiveness poles, the list of which was made public in July of this year. The aim of such poles is to network firms, research centres and higher education establishments in order to promote the development and concentration of synergies within the same geographical zone and same dominant sector. Based on this approach, the hope is to achieve a critical size which allows a comparative advantage to be gained around an innovative and targeted project. These poles will benefit from public funds in the form of tax and social relief, and, in particular, loans granted by new agencies for innovation and research. As far as Germany is concerned, even though it has some of Europe's most dynamic regions, regional performance in economic and technological terms varies greatly.

In Belgium, the regions undertake to varying degrees the search for synergies and coordinated policies through regional innovation systems, or the promotion of clusters. In some respects, Flanders appears to have acted earlier, on a larger scale and in integrated fashion, but accurately assessing the results obtained is far from easy. Cooperation between firms therefore remains the exception rather than the rule. In Wallonia, clustering policies have been developed later than in Flanders; an initial assessment of these policies resulted in the improvement of the tool and the launch of competitiveness poles based on the French model. Finally, the Brussels Capital Region seems less advanced in this field, perhaps as a result of specific town and country planning constraints.

Generally speaking, a certain synergy between the three regions' innovation policies would be beneficial, as pointed out by the "High Level Group 3 %" (2005). More in particular, the different entities might consider bolstering the potential of Brussels as a centre of activity. The experience of the successful European regions shows that they have benefited from the presence of a major city playing this catalyst role.

Conclusion

Faced with repeated questions regarding the future of industry in Belgium, this article has assessed the past developments and the current situation in an attempt to outline the steps to be taken if industry is to meet the challenges to come.

Over the course of the last few decades, industry and the economy as a whole have been subject to two inescapable underlying forces, namely sectoral changes, basically in the shape of the transfer of activities and jobs from industry to services, and the increasing globalisation of numerous areas of the economy. In all of the countries with so-called old industry, but even more so in Belgium due to its degree of openness and its specialisation in semi-finished products, industry has responded to these changes by achieving considerable productivity gains, thanks in particular to an increase in capitalisation, and by refocusing on its core business. This has enabled the volume of industrial activity in Belgium to grow at a rate that is in line with that of the economy as a whole, leaving the share of industry in economic activity, measured at constant prices, virtually unchanged. However, this positive response has also brought some painful adjustments as regards employment. Although these latter have taken the form of a dramatic reduction in the number of industrial jobs – more than offset by job creation in the service sector, partly linked to the outsourcing of tasks by industry –, they have been particularly felt at the level of certain branches or regions.

Recently, globalisation, being a source of challenges and opportunities and being synonymous with an increased division of the production process, has again accelerated as nearby emerging economies such as the ten new EU Member States, or large emerging economies, such as China, have appeared. The ensuing fears that production activities will be relocated to these countries on a massive scale, are not presently borne out by the indicators available for Belgium. However, these indicators, which are of a mainly financial nature, are partial and flawed for measuring this trend, which in turn is likely to change quickly. Hence, some surveys indicate that relocation is occupying the thoughts of many chief executives, and leading to effective decisions to reallocate activity. Furthermore, some of these emerging economies, including China, are rapidly progressing towards stages of development more focused on higher-technology products and innovation. It is therefore important to take an in-depth look at the nature of the developments still to come and the responses needed in order to position Belgian firms in geographical markets and in growth activities.

In this respect, what is at stake more than ever is the safe-guarding and improvement of the economy's competitiveness. Competitiveness, in the broad sense of the term, is characterised as much by factors directly determining the cost of production (compensation and productivity of production factors, intermediate inputs) as by factors determining the attractiveness and the innovative potential of an economy, by influencing product quality and differentiation, the effective organisation of the production process, etc.

In an increasingly competitive international environment, production costs remain a key factor in the overall competitiveness of an economy and as such, they must be closely monitored in order to ensure that they develop in a reasonable manner. Competitiveness, however, should not have to be wholly reliant on production costs. First of all, as far as hourly wage costs are concerned, emerging economies have an obvious advantage which simply cannot be rivalled, even if such an advantage must be regarded in terms of continued lower productivity. A comparison of production costs is more meaningful with respect to the countries of the EU-15, especially neighbouring countries, which constitute the main markets for our products and are our direct competitors in the allocation of the design, production and distribution process phases defined at European and global level. In this connection, it should be noted that Belgian industry has limited control over its production cost, which is more dependent on intermediate imports than is the case elsewhere, even though the single currency is making a major contribution by eliminating exchange rate fluctuations between euro area partners. However, this does not mean that the development of cost constituents determined in Belgium, both in industry or the branches to which it resorts (wages, the level of which remains high, return on capital or the cost of energy) requires less monitoring.

However, it would increasingly appear that economic dynamism can be measured in terms of its innovative capacity, whether it is in the products which the economy offers or in the production methods which it employs. This capacity is the result of the combination of a number of factors, the extent of which, and even more so the influence on the competitiveness of the economy, are tricky to gauge. The article has reviewed the most important of these factors, thus providing an outline summary of the main axes which are able to guide the response of economic agents in future.

A clear aim must be to preserve and increase the strengths of the Belgian economy, in particular its infrastructure (high rate of investment, including in ICT, transport and communication network, etc.) and the degree of training

of its workforce, which together help to explain the high level of apparent labour productivity. Even in these areas, shortcomings will need to be overcome as a matter of priority, by increasing public investment, by steering students more towards scientific and technical subjects, or by extending the practices of continuing training.

Moreover, in one way or another, innovation, and more particularly a consistent and integrated approach to innovation, seems to be a central feature in the experience of the most dynamic European economies. Innovation amounts to more than just devoting 3 p.c. of GDP to R&D expenditure; it must cut across all areas and involve all elements of society, centred as it is on the acquisition, dissemination and sharing of knowledge. Within the framework of a small, open economy such as Belgium, this includes, to an even greater extent, the process of learning and the appropriation of knowledge developed abroad.

Although all of the players are involved, one particular and multiple role falls to government. Firstly, Belgium is characterised by the structural weakness of its public investment and public funding of R&D. Additional efforts have thus to be made, within the framework of a healthy management of public finances. The State can also take action by creating conditions which are conducive to economic activity and the common good. In this respect, despite the fact that administrative procedures are regularly cited as a handicap, improvements have already been made, as the World Bank indicator shows. Finally, all government levels have a vital role to play in defining and implementing an innovation strategy. Some of the measures taken to achieve this include establishing contact between different players, the search for consensus with regard to the aims to be pursued together and the follow-up and assessment of what is achieved. Provided with such a coherent framework, firms, universities and workers would then benefit from clear and stable prospects for setting up an effective system for collaboration and the sharing of knowledge, conducive to the creation and spread of innovations.

The face of industry will continue to change in the coming years. Industrial firms nevertheless have a major role to play in the renewal of the economic fabric of Belgium. By figuring in the overall adaptation approach, supported by all agents, they will continue to make a key contribution to the growth of the economy's productivity and the prosperity of its inhabitants.

Bibliography

Aubert P. and P. Sillard (2005), *Délocalisations et réductions d'effectifs dans l'industrie française*, INSEE, Working paper G 2005/03.

Avonds L. (2005), *Een vergelijkende analyse van de Input-Output tabellen van 1995 en 2000*, Federal Planning Bureau, Working paper 4-05.

Avonds L. (2003), *Een poging tot vergelijking van de Input-Output-tabellen van 1990 en 1995,* Federal Planning Bureau, Working paper 19-03.

Avonds L., V. Deguel and A. Gilot (2003), *Quelques applications à l'aide du tableau entrées-sorties 1995*, Federal Planning Bureau, Working paper 18-03.

Beffa J.-L. (2005), *Pour une nouvelle politique industrielle*, Report to the President of the French Republic (www.rapport-jeanlouisbeffa.com).

Bhagwati J., A. Panagariya and T.N. Srinivasan (2004), "The muddles over outsourcing", *Journal of Economic Perspectives*, 18 (4), 93-114.

Biatour B. et al. (2005), *European R&D strategy: impact and feasability study for Belgium*, Federal Planning Bureau, Working paper 3-05.

Biatour B. (2004), *La R&D et l'innovation en Belgique: un diagnostic sectorie*l, Federal Planning Bureau, Working paper 15-04.

Bogaert H., A. Gilot and C. Kegels (2004), *L'industrie a-t-elle un avenir en Belgique?*, Federal Planning Bureau, Working paper 10-04.

Bogaert H. and A. Gilot (2000), "L'évolution du tissu économique", *Reflets et perspectives*, XXXIX (1), 17-31.

CEPII (2004), *European industry's place in the international division of labour: situation and prospects*, Report prepared for the Directorate-General for Trade of the EC (http://trade-info.cec.eu.int/doclib/html/118034.htm).

Cette G. and P. Artus (2004), *Productivité et croissance*, Report to the Economic analysis council of the French Prime minister (www.cae.gouv.fr).

Conseil Central de l'Économie (2003), "Politique industrielle: quelques pistes d'action", Lettre mensuelle socio-économique, no. 82, 3-13.

Cornille D. and B. Robert (2005), "Sectoral interdependences and cost structure in the Belgian economy: an application for input-output tables", *Economic Review of the National Bank of Belgium*, Second quarter 2005.

DATAR (2004), *La France, puissance industrielle: Une nouvelle politique industrielle par les territoires* (www.datar.gouv.fr).

De Backer K. and L. Sleuwaegen (2003), *Rapport over het concurrentievermogen van de Vlaamse economie* (www.ondernemerschap.be).

De Grauwe P. (2003), "De toekomst van de industrie in België", *Leuvense Economische Standpunten*, 2003 (102).

Delanghe H., V. Duchêne and U. Muldur (2004), "À l'aube d'une nouvelle vague de croissance?", *Futuribles*, no. 300, 19-44.

Drancourt M. (2004), "Industrialisation: la destruction créatrice", *Futuribles*, no. 297, 13-29.

Drumetz F. (2004), "La délocalisation", *Bulletin de la Banque de France*, no. 132, December, 27-42.

Duesterberg T.J. (ed.) and E.H. Preeg (ed.) (2003), *U.S. manufacturing, The engine for growth in a global economy, A project of the manufacturers alliance/MAPI*, Westport, Connecticut, Praeger publishers.

EC (2004a), *European competitiveness report 2004*, SEC (2004) 1397.

EC (2004b), *Fostering structural change: an industrial policy for an enlarged Europe*, COM (2004) 274.

EC (2003a), "The EU Economy 2003 Review", *European Economy*, 6.

EC (2003b), *European competitiveness report 2003*, SEC (2003) 1299.

EC (2003c), *Some key issues in Europe's competitiveness – towards an integrated approach*, COM (2003) 704.

EC (2002), *Industrial policy in an enlarged Europe*, COM (2002) 714 final.

ECB (2004), *Sectoral specialisation in the EU: a macro-economic perspective*, 5th Structural Issues Report, Monetary Policy Committee (www.ecb.int).

FBC (2004), *Stratégie 2010: pour un nouvel élan et un avenir pour nos enfants* (www.vbo-feb.be).

Federal Planning Bureau (2004), *Perspectives économiques 2004-2009*.

Finnish Prime minister's office (2004), *Finland's competence, openness and renewability. The final report on the "Finland in the global economy"* project, Prime minister's office publications 26 (www.vnk.fi).

Fontagné L. and J.-H. Lorenzi (2005), *Désindustrialisation, délocalisations*, Report to the Economic analysis council of the French Prime minister (www.cae.gouv.fr).

Gonzalez L. (2002), "L'incidence du recours à l'intérim sur la mesure de la productivité du travail des branches industrielles", *Économie et statistique*, no. 357-358, 103-137.

Grignon F. (2004), *Délocalisations: pour un néocolbertisme européen*, Information report to the French Senate (www.senat.fr).

Gusbin D. and B. Hoornaert (2004), *Perspectives énergétiques pour la Belgique à l'horizon 2030*, Federal Planning Bureau, Planning paper 95.

Hansen J.P. (2004), *Quel avenir pour l'industrie en Europe?*, Communication à l'Assemblée de l'Union Wallonne des Entreprises, Genval, 20 January 2004.

Henriot A. (2004), "La France est-elle en voie de désindustrialisation?", in *Les entreprises françaises en 2004, le défi extérieur*, sous la direction de C. de Boissieu et C. Deneuve, 97-112, Paris, France, Economica.

High Level Group 3 % (2005), *Recherche, technologie et innovation en Belgique: les chaînons manquants*, Final report (www.belspo.be).

Institute for Management Development (2005), *World competitiveness yearbook* (www.imd.ch).

Kok W. et al. (2004), *Facing the challenge: the Lisbon strategy for growth and employment*, Report from the High level group chaired by Wim Kok, EC (http://europa.eu.int/growthandjobs).

Melyn W. (2004), "Characteristics and development of Belgium's foreign trade", *Economic Review of the National Bank of Belgium*, Third quarter 2004.

O'Mahony M. and B. Van Ark (2003), *EU productivity and competitiveness: an industry perspective*, Enterprise publications, EC.

Rowthorn R. and R. Ramaswamy (1997), *Deindustrialization – its Causes and Implications*, IMF Economic Issues.

Sels L. et al. (2002), *Opleiding en ontwikkeling in KMO's*, Cahier 4 van het VIONA-project "Personeelsbeleid in KMO's: een onderzoek naar de kenmerken van een effectief KMO-personeelsbeleid", Hoger instituut voor de arbeid, KUL (www.hiva.be).

Sleuwaegen L. and K. De Backer (2001), "Desindustrialisatie in België", *Tijdschrift voor Economie en Management*, XLVI (3).

Van Ark B. and E. Bartelsman (2004), *Fostering excellence: challenges for productivity growth in Europe*, Background document for the Informal Competitiveness Council Maastricht.

Vandille G. and B. Van Zeebroeck (2003), *Les comptes environnementaux en Belgique*, Federal Planning Bureau, Planning paper 93.

Van Ierland W. (2004), *Guide des instruments économiques à mettre en œuvre dans le cadre des politiques climatiques domestique et internationale*, Federal Planning Bureau, Working paper 3-04.

World Bank (2004), *Doing business in 2005: removing obstacles to growth*, (http://rru.worldbank.org/doingbusiness).

The potential growth of the Belgian economy and its determinants

C. Rigo*

Introduction

The potential growth path of the economy is at the centre of various fundamental economic questions. It arises, in particular, in connection with the conduct of monetary policy and the management of public finances. The growth potential combined with the trend in the population also determines the development of the level of prosperity in the economy. In recent years, renewed interest in this question has been kindled in the European economies by the dramatic advances in the new information and communication technologies (ICT) and their impact on productivity. The European debate on the Lisbon strategy also aims to strengthen growth potential, particularly in a context of population ageing.

Potential output is not recorded directly and therefore has to be estimated by indirect means. There are various assessment methods available for this purpose. The present analysis is based on the production function approach. This method, which is used in analyses of the same type conducted by institutions such as the EC, links the growth potential to three determinants, namely the labour and capital available in the economy and the efficiency with which those production factors are used; that efficiency depends partly on technological progress.

The study will focus primarily on the case of Belgium. However, an international dimension is essential in order to provide reference points. The first chapter discusses the potential growth of the Belgian economy and its determinants, assessed over the past two decades (1982-2004). That growth will be compared with the assessments for the various EU-15 countries, produced by the EC.

The growth path obtained by the production function approach can also be judged on the basis of the trends observed in the past in terms of the volume of labour and apparent labour productivity. The second chapter presents a comparison between the developments recorded in Belgium, and more generally in the EU-15 as a whole, and those seen in the United States. Knowledge of the determinants of productivity is still imperfect. Various studies suggest factors which could influence its development, but it is still difficult to assess their real influence. Among these factors, the development of ICT is often mentioned. Other elements, particularly concerning the quality of the production factors and certain more structural aspects of the economy, are liable to influence productivity. The second chapter considers Belgium's situation in regard to these factors.

1. Potential growth in Belgium and its determinants

Potential output can be defined as the level of output which is sustainable over time, i.e. without generating imbalances on the market in goods and services and on the labour market. It represents the supply capacity of an economy, taking account of the normal use of the available production factors, i.e. use which is compatible with stable inflation and a balanced trend in wages. Actual output may be higher than potential output, but can equally be lower, with fluctuations around the potential level being due to short-term divergences between supply and demand. These fluctuations give rise to what is known as the output gap. This gap is positive if the

production factors are overused in order to cater for strong demand, a situation which is liable to lead to pressure on wages and prices; when the gap is negative, that indicates that the production factors are underused owing to a demand deficit. In a market economy, an output gap cannot persist in the long term, as the wage and price adjustment process restores equilibrium between supply and demand.

Since an economy's potential GDP cannot be measured directly, nor can it be quantified by compiling basic information as in the case of actual GDP, for example, it has to be estimated indirectly.

Various methods of estimating potential GDP have been developed[1]; they can be divided roughly into the following categories:
– *"statistical" methods*, which – in the case of the univariate methods – aim to extract the trend component of the actual GDP series (e.g. by calculating a linear trend or by applying a Hodrick-Prescott filter); in the case of a multivariate approach, they consider a number of series simultaneously (GDP, inflation, interest rates, real wages, etc.) but without establishing explicit links between the production factors and the level of output (e.g. SVAR models, models with non-observable components);

– *"structural" methods*, based on a production function in which the level of output is determined explicitly by the production factors used.

The range of methods developed over time reflects the difficulty of finding one which appears irrefutable, reliable and appropriate for all types of use. Many empirical studies propose the simultaneous use of different methods in order to determine an order of magnitude – rather than focusing on an exact estimate of potential output – and to permit an assessment of the robustness of the results. However, the use of multiple assessment methods entails the risk of arriving at an ambiguous result.

The analysis proposed in this article is based on the use of a production function in the context of what is called growth accounting. This method, which is widely used by international institutions, makes it possible to highlight the role of the various growth determinants, namely the supply of the production factors – labour and capital – and total factor productivity (TFP), i.e. the efficiency with which these factors are combined. By means of a somewhat simplified representation of the economy (cf. box and annex), this method permits an easy interpretation of past developments and offers the possibility of assessing the long term growth.

(1) For an overview of the various methods, see ECB (2000), De Masi (1997) and Guarda (2002).

Growth accounting

The most frequently used method of growth accounting is based on a production function in which the level of output (Y) is a function of three determinants: the quantity of labour (L), the capital stock (K) and total factor productivity (TFP).

$$Y = f (L, K, TFP)$$

The production function generally used for growth analysis is a Cobb-Douglas function. This type of function offers a simplified but relatively accurate representation of the supply relationships of industrialised economies and produces results which are easy to interpret. It conforms to all the assumptions made in the neo-classical approach to growth: decreasing marginal returns of the production factors L and K and constant economies of scale for these factors. It takes the following form:

$Y = TFP . L^{\alpha} . K^{(1-\alpha)}$ where α reflects the share – assumed to be constant – of the factor labour in the production process (approximated by the share of wages in total factor remuneration).

▶

TFP provides an overall measure of the efficiency of the production process, taking account of the combined use of the production factors. Two countries using the same quantity of labour and the same stock of capital could achieve different levels of output depending on whether their organisation is more or less efficient. In short, TFP is sometimes treated as a measure of technical progress.

In terms of rates of change (indicated by an ° above the variables), the previous equation can be restated as follows:

$$\overset{\circ}{Y} = \overset{\circ}{TFP} + \alpha \, . \, \overset{\circ}{L} + (1 - \alpha) \, . \, \overset{\circ}{K}$$

In the empirical applications, the growth rate of TFP is calculated as a residual figure, being the difference between the output growth rate and the weighted growth rates of the quantities of production factors used:

$$\overset{\circ}{TFP} = \overset{\circ}{Y} - \alpha \, . \, \overset{\circ}{L} - (1 - \alpha) \, . \, \overset{\circ}{K}$$

Consequently, the estimate of the TFP growth rate is influenced by the way in which L and K are measured, and more specifically by the content attributed to these two determinants. The more accurately L and K are measured in terms of their potential contribution to output, the smaller the bias which may affect the measurement of TFP. Thus, the labour used is not taken simply as the number of persons working. The hours worked or the skills of the labour force can also be taken into account[1]. The same quantity of capital can also vary in its contribution to output according to the age of the machinery and its nature (traditional working tool or one geared more to the new technologies)[2]. TFP therefore reflects the influence on output of all the factors which are not captured by the respective measurements of L and K. Consequently, to permit international comparisons of TFP, it is necessary to ensure that the data used are as homogeneous as possible.

The method adopted by the Bank to estimate potential output is derived directly from the one used by the EC [3] and is based on the fundamental principles of growth accounting. The variables (L, K and TFP) which occur in the production function are constructed from actual observations. They then undergo smoothing to eliminate cyclical movements and short-term erratic fluctuations, and thus approximate as closely as possible to structural trends. The smoothing procedures using a Hodrick-Prescott (HP) filter are implemented with due regard for the medium-term forecasts produced for the Eurosystem projections, in order to attenuate the end-of-period bias inherent in this smoothing method.

In the approach adopted, potential output therefore depends on the "potential" levels of the determinants, identified in growth theory:

$$Y^* = TFP^* \, . \, L^{*\alpha} \, . \, K^{*(1-\alpha)} \qquad \text{where * refers to the potential levels.}$$

The method used is presented in more detail in the annex.

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(1) Labour quality reflects the effectiveness of the hours worked per category of personnel. Here, the factor labour has to be allocated to various classes of workers (generally taking account on the standard of education), weighted according to their remuneration, which is assumed to reflect the efficiency of the labour.

(2) A sophisticated measurement of capital's contribution to output is based on the concept of capital services. However, this measure, which aims to take account of the productive capacity of the various assets making up the capital stock, is demanding from a statistical point of view and is not very widespread as yet. For more details, readers may refer to the work of the OECD [notably Shreyer et al. (2003)].

(3) Denis et al. (2002).

1.1 Potential growth in Belgium

Considering that public sector activity and employment cannot exert any fundamental influence on the potential growth of the economy, the assessment method which has just been outlined was used to estimate the potential output of the private sector in Belgium. The development of public services is indeed dictated by determinants other than those which lead to long-term market equilibrium. However, the government has a key role to play in establishing a framework conducive to increased productivity throughout the whole economy.

Over the period 1982 to 2004, the potential output of the private sector grew at an annual average rate of 2.2 p.c. in Belgium. The largest contributions came from the development of TFP and the growth of the capital stock, each of these elements accounting for 1 percentage point. The contribution of the factor labour averaged just 0.2 percentage point over the period as a whole. Taking account of the value added of the public sector, potential GDP growth for the Belgian economy as a whole is estimated at 2.1 p.c.

		Sub-periods	
	1982-2004	1982-1995	1996-2004
Potential growth of the private sector [1]	2.2	2.3	2.1
Labour [2]	0.2	0.1	0.4
Capital [2]	1.0	1.0	0.9
Total factor productivity [2]	1.0	1.1	0.8
p.m. Potential growth of the economy as a whole [1]	*2.1*	*2.1*	*2.1*

Source: NBB.
(1) Percentage change.
(2) Contributions to the potential GDP growth of the private sector.

The potential growth of the private sector increased at a fairly steady pace during this period, generally fluctuating within the range of 2 to 2.5 p.c. However, between 1989 and 1991 it grew by almost 3 p.c. as a result of exceptional expansion of the capital stock.

CHART 1   POTENTIAL GROWTH OF THE PRIVATE SECTOR IN BELGIUM AND ITS DETERMINANTS

(Contributions to the growth of the potential value added of the private sector, unless otherwise stated)
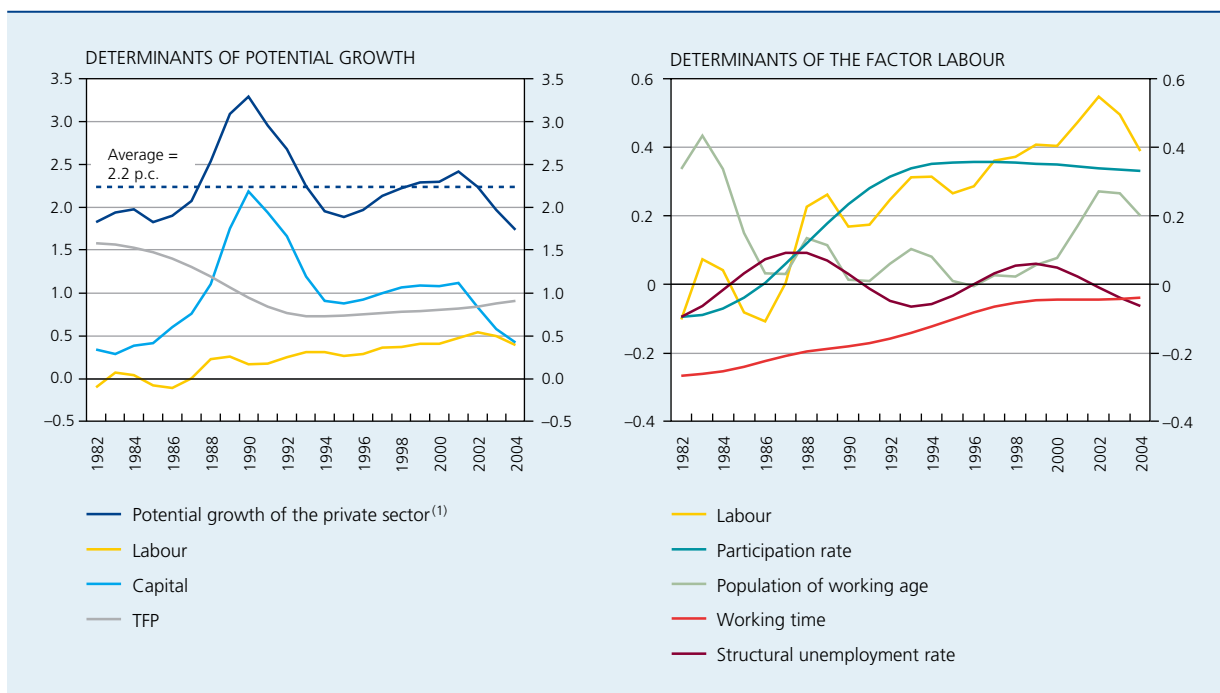
Source: NBB.
(1) Percentage change.

| TABLE 2 | COMPARISON OF ESTIMATES OF POTENTIAL GROWTH FOR BELGIUM |
| | (Percentage change, economy as a whole) |

| | 1985-2004 | Sub-periods | |
		1985-1995	1996-2004
EC	2.1	2.1	2.1
IMF	2.2	2.2	2.2
OECD	2.1	2.2	2.0
p.m. NBB	*2.2*	*2.3*	*2.1*

Yet the relatively stable growth rate of potential output masks substantial movements in the various determinants. The biggest changes were seen in the capital stock. Except for the boom which occurred around 1990, the capital stock experienced a period of weak growth in the first half of the 1980s and a marked slowdown after 2000. In all probability, these movements in the capital stock are partly cyclical. The contribution of TFP, the main engine of growth in the early 1980s, was halved, as TFP growth fell from 1.5 p.c. to around 0.7 p.c. in the mid 1990s. Subsequently, a slight upward trend was seen, with the growth rate rising towards 1 p.c. Finally, the contribution to private sector growth made by the volume of labour has tended to increase over the years, since it was practically zero at the start of the analysis period and has totalled around 0.5 percentage point in recent years.

The estimate of the potential volume of labour can in turn be broken down into various components. Thus, it seems that the pick-up in labour's contribution to growth can be attributed partly to an upward trend in the activity rate and partly to a deceleration in the trend towards shorter working hours. Apart from these two medium-term developments, labour's contribution to growth is also influenced by changes in the size of the population of working age. This component has been favourable in recent years, influenced not only by purely demographic factors but also by campaigns to regularise residents "without papers". Finally, the movement in the structural unemployment rate had a negligible impact on growth.

Despite differences between the assessment specifications and methods, the potential growth figure obtained here is of the same order of magnitude as that estimated for Belgium by other bodies, such as the EC, the IMF and the OECD. The divergences come to no more than 0.2 percentage point.

1.2 Comparison with the other EU-15 countries

On the basis of the EC estimates, obtained by using a harmonised method, the EU-15 countries may be divided into three groups according to their average potential growth since the mid 1990s. Belgium is among the group of countries where growth was close to the EU-15 average. The same is true of the Netherlands, Sweden, Portugal, Austria, Denmark and France, which recorded growth of potential GDP in the order of 2 p.c. While potential growth did not change substantially between 1985-1995 and 1996-2004 in Belgium, the Netherlands and France, it did slow down in Portugal and Austria, and gained momentum in Sweden and Denmark.

Another group of countries was notable for higher potential growth during the period 1996-2004. In Finland, Spain, Greece and the United Kingdom, the figure reached around 3 p.c., a growth rate comparable to that recorded in the United States. It was significantly higher in Luxembourg, and especially in Ireland where it exceeded 7 p.c. In this last country, potential growth was probably boosted by a "catching up" effect, owing to a strong rise in productivity in a context of market integration, substantial foreign investment and European subsidies, and the incentive for greater participation in the labour market.

| CHART 2 | POTENTIAL GROWTH IN THE EU-15 COUNTRIES |
| | (Percentage change) |

■ 1985-1995
■ 1996-2004
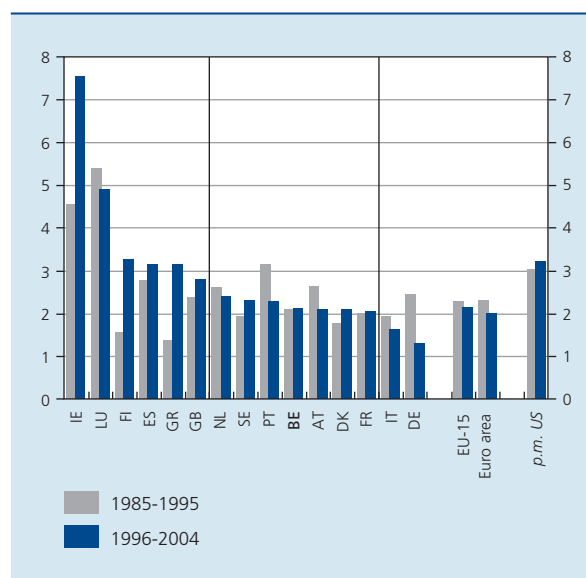
Sources: EC, OECD.

Finally, Italy and Germany feature relatively weak potential growth, averaging around 1.5 p.c. since 1996. In the case of the German economy, this figure represents a decline of more than 1 percentage point compared to the ten preceding years.

The wide dispersion of potential growth rates in the EU-15 countries during the period 1996-2004 reflects very divergent situations in terms of the contributions of the various factors. Thus, it seems that labour made a major contribution in Ireland and Spain. The substantial mobilisation of the factor labour in both these countries evidently led to excess growth totalling 1.9 and 1.2 percentage points respectively, in comparison with the EU-15 average. A number of elements contributed to this outcome. In Ireland, the expansion of the population of working age came to around 2 p.c. per annum, the activity rate increased by almost 6 percentage points between 1995 and 2004, while the structural unemployment rate declined by around 8 percentage points. In Spain, it was mainly the steep rise in the activity rate, totalling 9 percentage points, that accounted for the large growth contribution made by the factor labour, together with a fairly significant fall in the structural unemployment rate. Some surplus growth, albeit on a smaller scale, is also attributable to labour in Luxembourg and the Netherlands. Conversely, the contribution of the use of labour is relatively close to the average in Belgium, while in Germany, Denmark and Sweden, potential growth was impeded by a labour shortage. The population of working age remained static in the first two countries, and the participation rate – though high in relation to the other European countries – declined in Denmark and Sweden.

The strong expansion of the capital stock in Ireland and Luxembourg produced a contribution to potential growth totalling around 1.7-1.8 percentage points in these two countries, about 1 point above the EU-15 average. Spain, Portugal and Greece also performed well from this point of view. Conversely, in Finland the capital stock appeared to make a rather low contribution to potential growth. In Belgium, the figure was about average.

Finally, in Ireland and Luxembourg the contribution of TFP was also well above the average, adding excess growth of 2.4 and 1.1 percentage points respectively. The dramatic rise in GDP in these two countries over the past ten years was therefore generated in varying degrees by the three determinants : labour, capital and TFP. Finland and Sweden were also among the countries with the biggest rise in TFP. In Belgium, EC estimates put the figure at 1 p.c., which is slightly above the average of 0.8 p.c. recorded in the EU-15. Conversely, it was low or zero in Italy, Portugal and Spain.

2. Growth strengths and weaknesses : Belgium's position in the EU-15 and in comparison with the United States

The first part of the analysis has shown the relative importance of labour, the capital stock and TFP in the movement in the economy's potential growth. Next, it is useful to identify the strengths or weaknesses on the basis of the results observed, as the lessons to be derived from that analysis could indicate possible areas for providing structural support for the economy's development.

In that connection, the main focus will be on the volume of labour and apparent labour productivity ; these are directly measurable variables, so that it is easier to draw up a list of strengths and weaknesses for the Belgian economy. The box on the opposite page shows that the breakdown of growth between the volume of labour and apparent labour productivity is derived directly from the growth accounting approach, as apparent labour productivity is itself a function of TFP and the capital to labour ratio.

CHART 3 DETERMINANTS OF POTENTIAL GROWTH IN THE EU-15 COUNTRIES OVER THE PERIOD 1996-2004

(Contributions to potential growth, percentage points)

Labour —
Capital — EU-15 average
TFP —

Source : EC.

50

As mentioned in the first chapter, the US economy has relatively high potential growth. This chapter therefore proposes to assess the developments seen in Belgium not only in the light of those recorded on average in the EU-15 but also by comparison with the United States.

Over the past twenty years, the average annual growth rate of GDP in the United States has outpaced that of the EU-15 by around one percentage point, with figures of 3 p.c. and 2 p.c. respectively. The gap has actually widened somewhat over the years, as growth edged

upwards in the United States while slowing down slightly in Europe. In Belgium, the GDP growth rate was close to that of the EU-15.

However, the reasons for this growth differential between the two continents have not remained the same since the mid 1980s: at first, growth in the United States was bolstered by a stronger rise in the volume of employment than in Europe, but later it was due to higher growth of labour productivity.

Analytical breakdown of growth

In an analytical approach, Y output can be broken down between the volume of labour used (L) and what is known as apparent labour productivity $(\frac{Y}{L})$.

$$Y = L \cdot \frac{Y}{L}$$

On the basis of the classic formula for the production function $Y = TFP \cdot L^{\alpha} \cdot K^{(1-\alpha)}$ and dividing both elements of this equation by L, it is evident that apparent labour productivity can be written:

$$\frac{Y}{L} = TFP \cdot \left(\frac{K}{L}\right)^{(1-\alpha)}$$

In terms of the rate of change:

$$\overset{\circ}{\frac{Y}{L}} = \overset{\circ}{TFP} + (1-\alpha) \cdot \overset{\circ}{\frac{K}{L}}$$

Apparent labour productivity is therefore determined by:
– TFP, as defined in the previous box, and
– the capital to labour ratio, also known as capital intensity (or capital deepening). An increase in the capital employed per unit of labour contributes to an increase in apparent labour productivity.

2.1 Volume of labour

For a long time, growth in the United States was underpinned by a strong rise in the volume of labour, which grew by an annual average of 1.7 p.c. until 1997. During this period, the number of hours worked showed only a modest increase in the EU-15, at 0.3 p.c. per annum, while the picture was even less favourable in Belgium where the volume of labour remained static. At the end of the 1990s, some convergence nevertheless occurred, as the rise in the volume of labour slowed down significantly in the United States while it accelerated slightly in Belgium, as it did in the EU-15 as a whole.

First, the faster average rise in the volume of labour in the United States was due to strong expansion of the population of working age. This increased by more than 1 p.c. per annum, whereas it stagnated in Belgium and grew by just 0.3 p.c. per annum on average in the fifteen EU countries. It was also reinforced by the movement in working time per person employed. In the United States, working time remained constant overall, but declined steadily in Belgium and in the EU as a whole, by around 0.5 p.c. per annum on average. The employment rate in Europe – i.e. the number of persons in work as a percentage of the population of working age – remained well below the United States figure, which peaked at around 80 p.c. in 2000, whereas it was only about 60 p.c. in Belgium, 4 percentage points below the EU-15 average.

CHART 4

**VOLUME OF LABOUR : COMPARISON
WITH THE EU-15 AND THE UNITED STATES**

VOLUME OF LABOUR (1)
(annual percentage change)

Belgium ——— EU-15 ——— United States ▇

BREAKDOWN :

POPULATION OF WORKING AGE (2)
(indices 1985 = 100)

EMPLOYMENT RATE (2)
(percentages)

AVERAGE ANNUAL WORKING TIME PER WORKER
(hours)

Belgium ——— EU-15 ——— United States ———
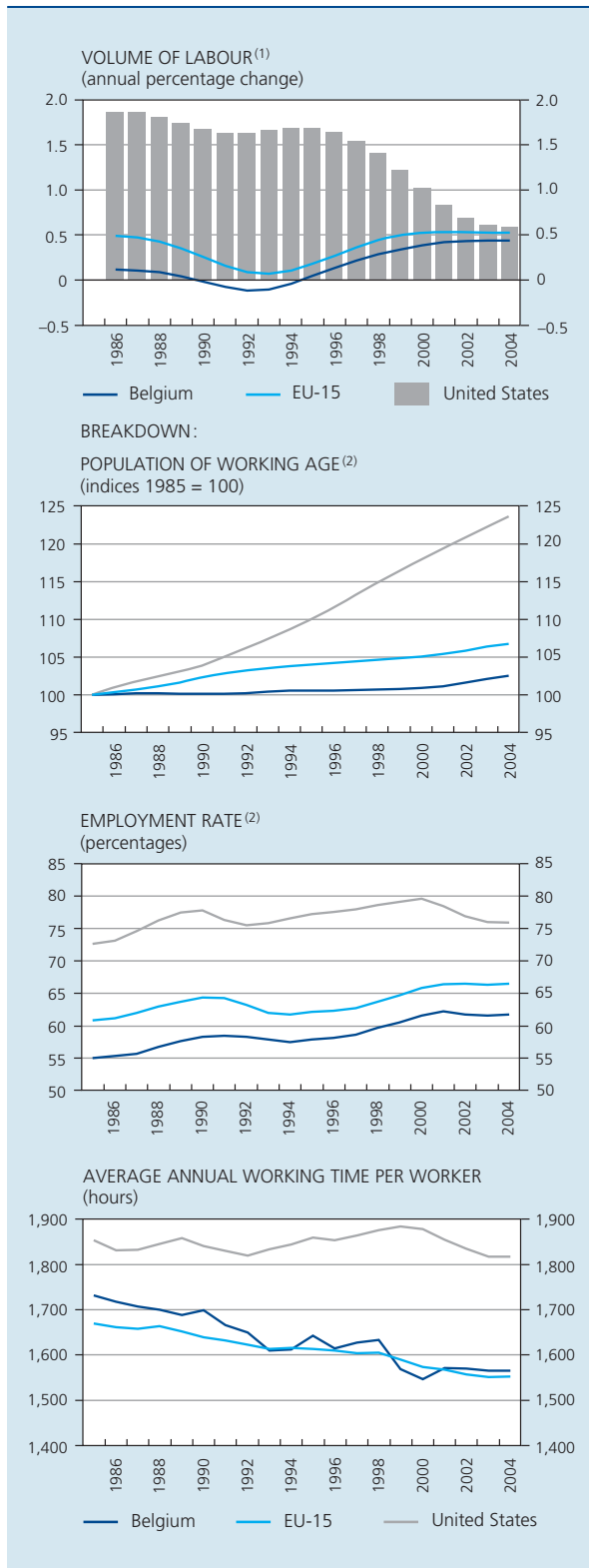
Sources : EC, GGDC, NBB calculations.
(1) Defined as the number of hours worked, series smoothed by means
of a Hodrick-Prescott filter.
(2) Defined as the number of persons in work as a percentage of the population of
working age.
(3) Population aged from 15 to 64 years.

The low participation rate is a well-known characteristic of the Belgian economy. A low level of participation in the labour market by certain age groups, particularly the older ones, relatively high labour costs which encourage the substitution of capital for labour, and a lack of both functional and geographical mobility are all factors which depress the volume of labour. Eliminating these barriers could stimulate future growth in the volume of labour, in a context where the population of working age is expected to expand more slowly, or even decline, over the coming decades.

While the employment rate in Europe and in Belgium was constantly below the US figure, it mirrored the upward trend in the United States between the mid 1980s and the year 2000. It subsequently remained steady in the first two cases, while a decline of almost 4 percentage points was seen in the United States, reflecting the "recovery without employment" which has typified the recent economic cycle in that country. The contraction of the employment rate on the American continent, combined with a decline in working time, which contrasts with the stable position recorded in the EU-15 and in Belgium in recent years, explains the comparable results recorded recently in terms of the volume of labour on the two continents.

2.2 Apparent labour productivity

The convergence of performance in terms of the volume of labour in the United States, the EU-15 and Belgium was accompanied by a reversal of the relative figures for apparent labour productivity which enable the US economy to maintain its advantage in terms of economic growth.

Up to the mid 1990s, the European countries were ahead of the United States : apparent labour productivity, i.e. the volume of output per hour of work, was rising faster in the former countries. Belgium did even better with a rise in labour productivity which was above the European average. However, a persistent slowdown was seen in Europe, whereas American labour productivity speeded up considerably from the mid 1990s. In the past few years, this productivity has grown by around 2.3 p.c. in the United States, while in the EU-15 the increase came to only 1.5 p.c., the same as the rate of increase in Belgium.

This reversal of relative performance in terms of productivity is due to a more favourable picture in terms of both capital intensity and TFP in the United States. The increase in the capital available per worker had supported European growth up to the mid 1990s, but then slowed progressively while a fairly marked revival was seen on the

CHART 5   APPARENT LABOUR PRODUCTIVITY :
COMPARISON WITH THE EU-15 AND THE
UNITED STATES

APPARENT LABOUR PRODUCTIVITY [1] [2]
(annual percentage change)

CAPITAL INTENSITY [2] [3]
(annual percentage change)

TOTAL FACTOR PRODUCTIVITY [1]
(annual percentage change)

— Belgium   — EU-15   ▨ United States
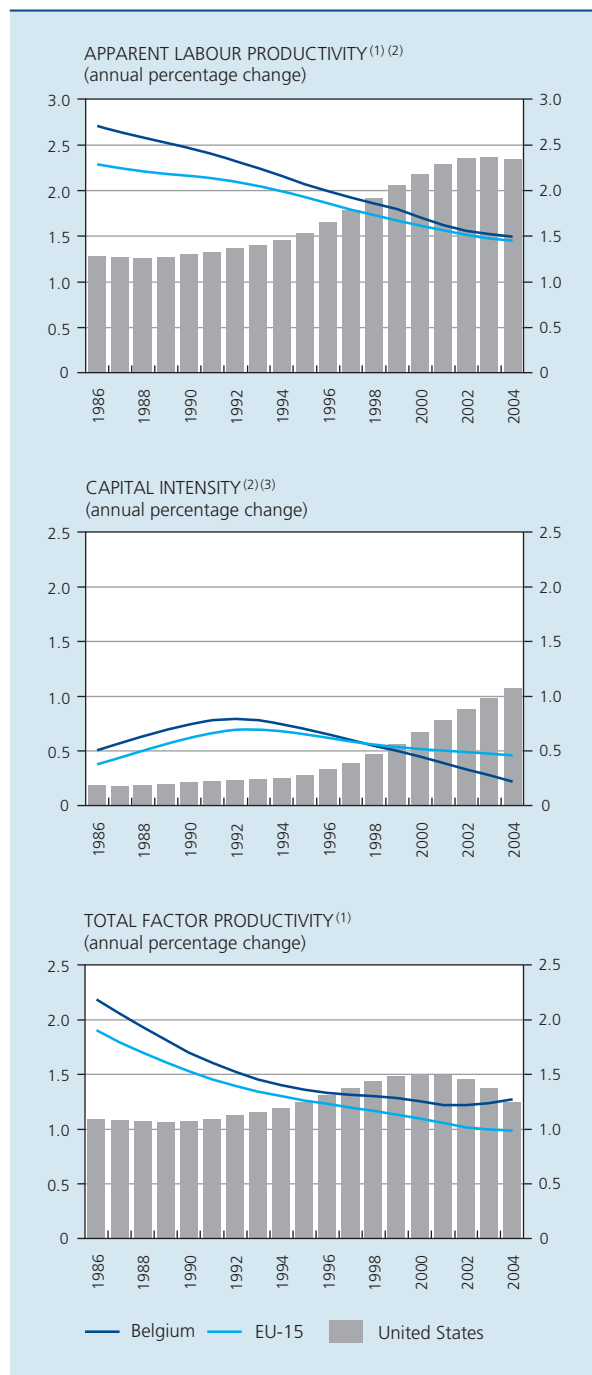
Sources : EC, GGDC, NBB calculations.
(1) Defined as GDP per hour worked.
(2) Series smoothed by means of a Hodrick-Prescott filter.
(3) Also known as capital deepening ; defined as the ratio between the net capital
stock and the number of hours worked.

American continent. The employment and wage modera-
tion policies pursued in Europe had the effect of increas-
ing the relative cost of capital, and making the factor
labour relatively less expensive. These policies, which aim
to augment the employment content of growth, cause a
fall in apparent labour productivity as a result of substitu-
tion between the two factors of production.

Relative developments in TFP are, by their nature, more
fundamental. A very marked tendency towards decelera-
tion of TFP is evident in Europe, and in Belgium, although
the growth rate here has remained slightly above the
EU-15 average and even tended to stabilise in recent
years. Thus, the rise in TFP in Europe has dropped from
2 p.c. in the mid 1980s to around 1 p.c. at present.
Conversely, in the United States the growth of TFP
increased by half a percentage point, mainly as a result of
an acceleration during the second half of the 1990s.

2.3 Factors which may influence labour productivity

The disappointing trend in apparent labour productivity
in Europe, and above all in TFP, led to questions about
the factors which might support the latter. There is plenty
of literature on this subject, covering a broad spectrum of
areas for action. Readers may refer to the study by Denis
et al. (2004), which offers an interesting summary and
attempts to quantify all the factors which may influence
labour productivity.

2.3.1 Influence of ICT

Numerous studies have highlighted the fact that the
strong acceleration in apparent labour productivity in the
United States from the mid 1990s was largely attributable
to the role played by the new technologies, generally
known as ICT (information and communication technol-
ogy). ICT is often regarded as a veritable industrial revolu-
tion, leading to a rise in long-term growth potential which
can improve the standard of living.

The development of ICT appears to have generated sub-
stantial productivity gains via the production channel.
The branches producing ICT are in fact noted for rapid
technological progress, so that their TFP tends to increase
sharply, boosting productivity at the level of the economy
so long as the ICT-producing industry is sufficiently large.
That is the case, in particular, in the United States, and in
Ireland and Finland in Europe.

ICT INVESTMENT IN THE EU-15 COUNTRIES
(Percentages of GDP, current prices)

1980
2004
- - - EU-15 average in 2004
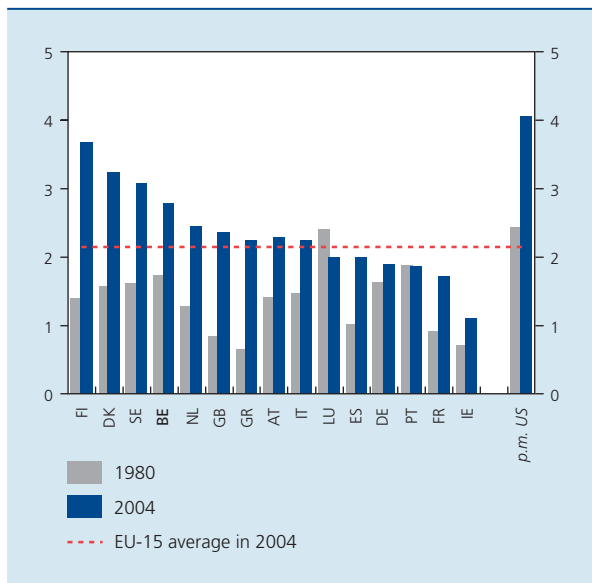
Source: GGDC.

Moreover, the rise of the new technologies was accompanied by a fall in price coinciding with an improvement in the performance of ICT products (computers, microprocessors, etc.). This caused labour to be replaced by capital as the latter became less expensive. As a result, apparent labour productivity was augmented by a higher rate of capital intensity in ICT.

Finally, the spread of ICT throughout the economy has led to a rise in TFP in all ICT-user branches, as these technologies permit greater efficiency in the combined use of labour and capital. This was evident in the United States, where the branches investing most heavily in ICT, such as trade and financial services, have seen faster growth of TFP than other branches of activity. However, in order to be fully effective, the use of ICT has to be combined with additional investment in appropriate staff skills and organisational changes. The regulatory context, the climate of confidence and security, the availability of appropriate skills, the ability to modify the organisation and the capacity to innovate influence the degree to which firms can take advantage of the spread of ICT.

(1) The studies undertaken for several years now by the GGDC ("Groningen Growth & Development Centre") of Groningen University, particularly Professor Van Ark, relate to comparisons of the level of economic performance and growth differentials between countries. These studies are quite well-known, as this research centre has gained substantial experience on the subject and developed a large harmonised database. Both the OECD and the EC make frequent reference to it. Some of these studies, more specifically mentioned here, attempt to quantify the influence of ICT on growth in Europe, in comparison with the United States, on a basis which has been harmonised as far as possible. Data on ICT are not always available in official national sources, so that estimates and extrapolations are sometimes necessary. In Belgium's case, the GGDC based its work mainly on the calculations produced by the Federal Planning Bureau [Kegels et al. (2002)], which used a methodology largely compatible with that generally adopted in Van Ark's studies.

There have been many attempts to measure the influence of ICT on productivity, sometimes arriving at divergent conclusions. According to some studies, the influence of ICT on productivity is confined solely to the branches producing ICT. Other – more numerous – studies state that the influence is wider and is also exercised decisively, through the distribution channel, by the ICT-user branches, and particularly the service branches which are the main recipients of investment in ICT.

According to the data collected by the GGDC [1], it appears that Belgium was in fourth place in the EU-15 on the basis of the scale of ICT investment in 2004, which totalled 2.8 p.c. of GDP. Finland, Denmark and Sweden had higher investment rates than Belgium in this respect, while the United States was in an even more enviable position, with ICT investment exceeding 4 p.c. of GDP. Belgium thus has an ICT investment rate which is 0.6 percentage points above the European average, so that the spread of ICT in the Belgian economy appears to be a factor favourable to the relative growth of productivity.

Countries such as Finland and the United States are in a doubly favourable position, because not only the use of ICT is widespread, but also – in contrast to Belgium – manufacturing industry producing ICT holds

WEIGHT OF THE MANUFACTURING SECTOR PRODUCING ICT IN THE EU-15 COUNTRIES [1]
(Percentages of GDP, current prices)

1980
2002
- - - EU-15 average in 2002
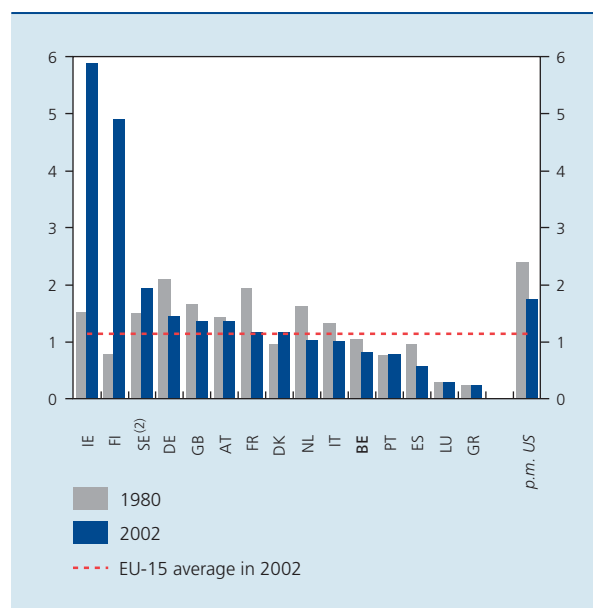
Source: GGDC.
(1) By approximation, share of value added of branches 30 ("Manufacture of office machines and automatic data processing machines"), 32 ("Manufacture of radio, television and communication equipment") and 33 ("Manufacture of medical, precision and optical instruments, watches and clocks") in total value added.
(2) Figure for the year 2000.

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an important place in the economy. Productivity growth is well above the average in ICT-producing industry. Thus, between 1995 and 2000 labour productivity increased by an annual average of around 15 and 25 p.c. respectively in this type of industry in Finland and the United States [1], contributing about one quarter of the total productivity growth of the economy as a whole. Ireland has also benefited from the notable presence of industries producing ICT, which are estimated to account for more than half of the general productivity growth in that country. Conversely, Irish investment in ICT appears to be the lowest in the EU, so that the Irish economy is gaining little from the influence of ICT on the productivity of the other branches of its economy.

In studies published in 2003, Van Ark et al. proposed a breakdown of the growth of hourly labour productivity over the period 1995-2001, in an attempt to quantify the possible influence of ICT on that figure. This breakdown is the most detailed conceivable, and although it does have its limits, it offers some interesting lessons. Thus, of the growth of almost 2 p.c. in hourly productivity in the United States, close on two-thirds (1.2 percentage points) appears to be due to the direct influence of ICT in the economy, namely both the contribution of capital intensity in ICT in all branches, and the contribution of the growth of TFP in the branches of industry producing the new

(1) Van Ark et al. (2002).

technologies; this last contribution depends mainly on the weight of this type of industry in the country. In Europe on the other hand, the direct influence of ICT was more modest, totalling 0.7 percentage point and accounting for half of the hourly productivity growth. Ireland stands out as the direct influence of ICT led to hourly productivity growth in excess of 4 p.c., owing to the large contribution made by the manufacturing sector producing new technologies. Thus, ICT appears to account for almost 80 p.c. of that country's productivity growth. The direct influence of ICT was also substantial in Finland, Sweden and the United Kingdom. It was less marked in Belgium, where it totalled 0.8 percentage point, owing to the virtual absence of a manufacturing sector producing ICT. Capital intensity in ICT led to a rise in hourly productivity in Belgium of the same order of magnitude as that seen in the leading countries in this respect, and well above the average level in Europe.

Capital intensity excluding ICT did not make an atypical contribution to productivity growth in Belgium. In fact, its contribution seems to have been in line with the European average, at around 0.5 to 0.6 percentage point. In contrast, in branches other than manufacturing industry producing ICT, TFP increased strongly in Belgium during the period 1995-2001, and made a large contribution of 1 percentage point to the growth of hourly productivity in the economy. That was even more the case in Finland. This aspect of the productivity breakdown reflects a range

TABLE 3   **BREAKDOWN OF THE GROWTH OF APPARENT LABOUR PRODUCTIVITY**
(Contribution to growth of apparent labour productivity. unless otherwise stated ; period 1995-2001)

	Effects directly linked to ICT				Other effects			p.m. Growth of hourly productivity
	Capital intensity in ICT products	TFP in ICT-producing industrial branches	Total		Capital intensity in non ICT products	TFP in branches other than ICT-producing industry [1]	Total	
			(a + b)	$\left(\frac{a + b}{e}\right)$				
	(a)	(b)	(a + b)		(c)	(d)	(c + d)	(e)
United States	0.7	0.4	1.2	(63 p.c.)	0.3	0.4	0.7	1.9
EU-14	0.4	0.3	0.7	(50 p.c.)	0.5	0.2	0.7	1.4
of which [2] :								
Ireland	0.7	3.6	4.2	(78 p.c.)	1.2	0.0	1.2	5.5
Finland	0.7	0.7	1.4	(45 p.c.)	−0.3	2.0	1.7	3.0
Sweden	0.8	0.6	1.4	(70 p.c.)	0.5	0.1	0.6	1.9
United Kingdom	0.6	0.4	1.0	(60 p.c.)	0.6	0.1	0.7	1.7
Belgium	0.7	0.1	0.8	(33 p.c.)	0.6	1.0	1.6	2.4

Source : Van Ark et al. (2003).
(1) TFP growth in branches other than ICT-producing industry reflects a whole range of factors. including the effect of the spread of ICT in those other branches.
    The ICT-related effects shown in columns (a) and (b) of the table therefore do not measure the total impact of ICT on productivity, but only the direct impact,
    excluding the diffusion effect.
(2) The five countries mentioned are those ranked highest on the basis of the total effects directly linked to ICT.

of explanatory factors which include the ICT diffusion effect, i.e. the possible influence of the integration of ICT on the TFP of the user branches.

2.3.2 Labour force skills

The development of a knowledge-based economy is one of the fundamental aims of the Lisbon strategy, designed to strengthen the competitiveness and dynamism of the European economy. A high standard of skills encourages the integration of innovations, and can attract foreign direct investment and stimulate the development of R&D and ICT. The quality of the labour force, which depends not only on the level of education but also on policies whereby training is continued throughout working life, is thus a factor which can stimulate economic growth.

The labour input measures generally used for the purpose of growth accounting analysis, namely the number of persons employed, or – preferably – the number of hours worked, do not take account of the quality of the labour force, so that the impact of this factor on productivity is reflected in the TFP measurement.

To our knowledge, there is no estimate of the influence of skills on TFP growth in the case of the Belgian economy. Nevertheless, some studies do propose an assessment for other countries, usually the biggest European countries.

Inklaar et al. (2003) thus propose an assessment of the influence of labour quality, approached via the level of education, on apparent productivity in the United States and in four European economies: Germany, France the Netherlands and the United Kingdom. This indicates that the productivity contribution of the improvement in labour quality is fairly similar in the United States and Europe, and that – in both cases – a slowdown in this contribution was recorded in the second half of the 1990s. Taking an average from 1995 to 2000, the improvement in the standard of education in the countries considered is estimated to have generated an annual increase in productivity totalling 0.2 percentage point. However, the results for the four European economies studied are quite divergent, as regards both the level of the contribution and whether it increased or decreased between the two sub-periods.

The estimate produced by the European Forecasting Network in 2004 is fairly similar where the US economy is concerned, and also shows a deceleration in the contribution of labour force skills to the growth of productivity in the second half of the 1990s. During that same period, the three European economies considered (Germany,

TABLE 4 LABOUR PRODUCTIVITY GROWTH ATTRIBUTABLE TO IMPROVEMENTS IN THE QUALITY OF THE LABOUR FORCE[1]

(Annual percentage change)

Estimation Inklaar et al.	1980-1995		1995-2000
United States	0.28		0.22
DE-FR-NL-GB	0.31 [0.08;0.50]		0.22 [0.05;0.41]
Estimate by EFN	1982-1990	1990-1995	1995-2000
United States	0.31	0.34	0.23
DE-FR-GB	n.	[0.14;0.95]	[0.28;0.35]
Estimate by Colecchia et al.	1985-1990	1990-1995	1995-2001
United States	0.46	0.55	0.36
DE-FR-IT-GB	[–0.49;0.95]	[0.21;1.64]	[0.42;0.59]

Sources : Colecchia et al. (2004), European Forecasting Network (2004), Inklaar et al. (2003).

(1) For each of the studies, the figures in brackets show the lowest and highest impact on growth among the European countries studied, for each period. They give some idea of the dispersion of the estimates. It is not necessarily the same country that records the lowest or highest impact on growth from one period to the next, or from one study to another.

France and the United Kingdom) appear to have a very slight advantage over the United States in this respect, although that difference cannot be regarded as significant. Moreover, the dispersion of the individual results appears to have diminished after 1995.

A third estimate produced by Colecchia et al. (2004) takes account not only of the level of education but also of age and sex. It confirms the declining positive influence of labour quality on productivity during the second half of the 1990s. Here, too, there appears to be no significant difference in the results between the United States and the European countries where the most recent period is concerned. Conversely, there was much greater divergence before 1995.

While the estimated effects on productivity of the level of skills vary between countries and over time, so that it is difficult to extrapolate them directly to Belgium, the link between these two variables is undeniably positive.

In that connection, the share of value added represented by branches making intensive use of skilled workers is relatively high in Belgium[1], which could be an advantage for productivity growth. That share, around 59 p.c. in 1999,

(1) According to estimates by O'Mahony and Van Ark (2003), who classify the branches into four categories : high-, higher-intermediate, lower-intermediate or low-skill intensive. This segmentation of the branches of activity according to the level of skill of the workers was effected on the basis of data for the United States and the United Kingdom, but seems transposable to European economies in general.

was higher than the European average (around 50 p.c.)
and even slightly above the United States figure (57 p.c.).
Some analysts argue that the spread of ICT is actually
responsible for the replacement of unskilled labour with
skilled labour, so that the relatively large share of branches
employing highly skilled staff in Belgium could in that
sense be another facet of the fairly widespread use of ICT
in the Belgian economy. Moreover, the relatively high cost
of unskilled labour in Belgium could also have restrained
the development of branches of activity employing mainly
low skilled workers.

One of the strengths of the US economy has been
the availability of a skilled labour force, but also to
have succeeded in creating employment for the least
favoured categories, thus achieving a high employment
rate, together with a sustained productivity growth. In the
EU-15 countries, there seems to be no obvious link
between the employment rate and growth of TFP. Some
countries, such as Finland, Sweden, Denmark and the
United Kingdom, appear to have succeeded, like the
United States, in combining an above-average employment
rate – which implies higher employment of less skilled
workers – with substantial growth of TFP. Conversely,
other economies such as Spain and Italy suffer from both
a low employment rate and a meagre rise in productivity.
Although there is no clear link here, it is possible that, in

CHART 9   TFP GROWTH AND EMPLOYMENT RATE
IN THE EU-15

(Averages, 1996-2004)
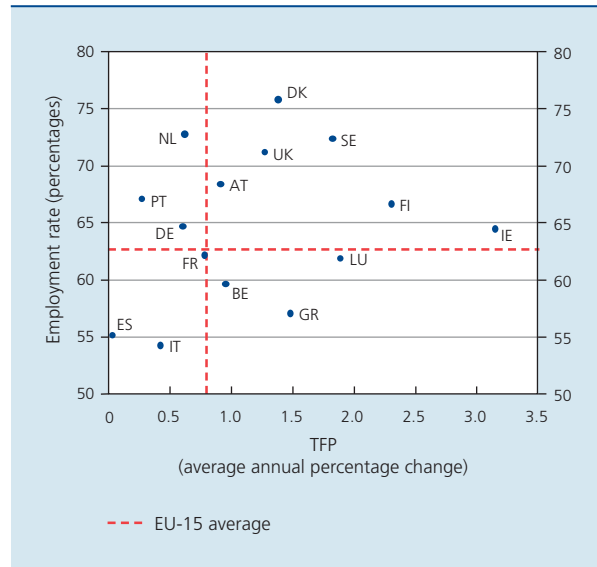
Source : EC.

Belgium, the low employment rate – indicating under-
employment of less skilled workers – is contributing to
above-average growth of TFP.

2.3.3 Research and development

The economy's ability to innovate is also frequently
cited as one of the key conditions for productivity
growth. Recent OECD studies[1], which measure that
ability in terms of the research and development (R&D)
effort, have shown the positive influence which it exerts
both directly – as a result of R&D activities conducted by
firms, the government and universities – and indirectly,
by permitting improved assimilation and exploitation of
innovations and expertise developed in other countries
(spillover effects). Thus, while domestic expenditure on
R&D seems to have a smaller impact on the productivity
of the smaller countries,[2] it nonetheless appears to be
precisely the small countries that gain the greatest benefit
from expenditure on R&D made abroad. Moreover, the
highly R&D-intensive countries seem to be the ones where
productivity gains the most from additional expenditure
on R&D, at home and abroad, since they have a higher
"absorption capacity". According to the study by Denis
et al. (2004), it also appears that the effects on labour
productivity of an increase in R&D expenditure as a

CHART 8   BREAKDOWN OF VALUE ADDED ACCORDING
TO THE DOMINANT SKILL LEVEL OF BRANCHES
OF ACTIVITY IN THE EU-15 COUNTRIES

(Percentages of total value added in 1999)
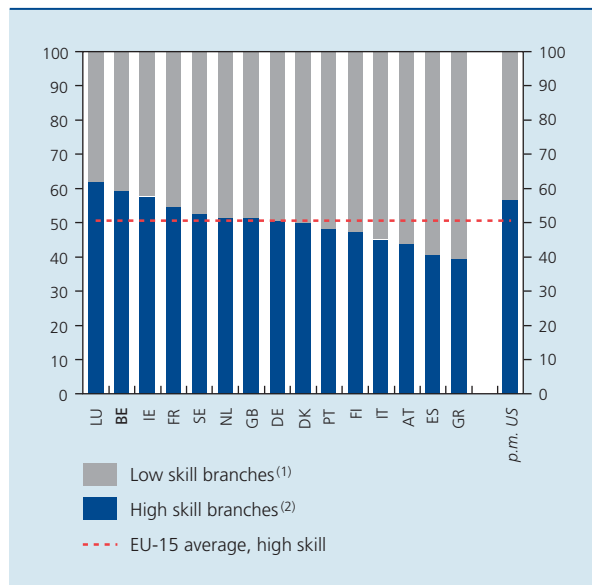
Source : O'Mahony and Van Ark (2003).
(1) Branches of activity classed as low-skill- and low-intermediate skill intensive.
(2) Branches of activity classed as high-skill- and high-intermediate skill intensive.

(1) cf. Guellec D. and B. Van Pottelsberghe de la Potterie (2001).
(2) cf. Coe and Helpman (1995).

CHART 10   TFP GROWTH AND R&D EXPENDITURE [1]
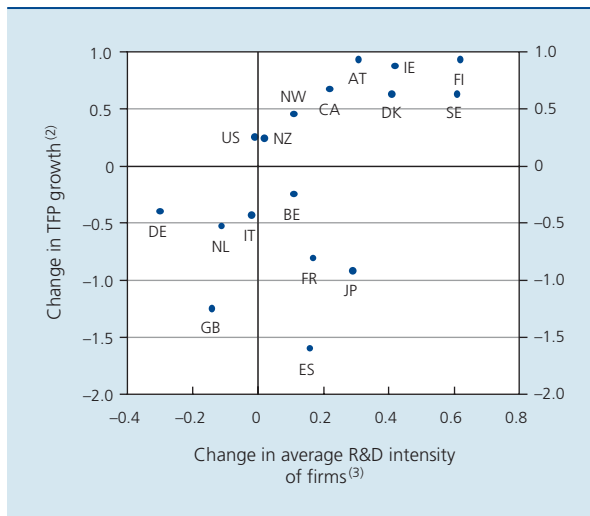
Source : OECD (2001).

(1) The statistical test reveals a significant link between the two variables :
    correlation coefficient of 0.57 and a Student's t of 2.65.
(2) Acceleration or deceleration of average annual TFP growth rate between
    the periods 1980-1990 and 1990-1999.
(3) Change in the average rate of expenditure on R&D by firms, expressed as
    a percentage of GDP between the periods 1980-1990 and 1990-1999.

percentage of GDP are much greater than the effects of an equivalent rise in the ratio of tangible investment expenditure. Thus, R&D expenditure seems to be far more "productive".

A strict causality between increased expenditure on R&D and productivity growth cannot be inferred. Other factors are at work, and it is highly probable that a whole range of conditions must be met before R&D investment can yield its full potential. Nonetheless, it is evident from an OECD study (2001) that the two countries where firms stepped up their R&D intensity the most between the 1980s and the 1990s – Sweden and Finland – are the ones which also saw the largest increase in TFP. Conversely, in Belgium the TFP growth rate dipped slightly, while there was a small increase in the R&D expenditure of firms as a percentage of GDP.

2.3.4 Other possible determinants

In addition to the above-mentioned factors, a set of elements which determine the economy's general working conditions also impact upon productivity, although to an extent which is hard to quantify.

Among these elements, the degree of (de)regulation might play a role in so far as it encourages competition within the national borders and beyond. Deregulation promotes the disappearance of the least profitable firms,

stimulates foreign direct investment and supports investment, particularly in ICT. However, deregulation could have an adverse effect on R&D investment, which would be better served by an environment offering some degree of security, especially as regards legal certainty, providing protection for innovations.

The size of the product market, in terms of both the domestic market and foreign outlets, seems to exhibit a positive correlation with productivity growth, particularly if it offers scope for larger-scale marketing, essential to recoup the cost of R&D.

Finally, it seems that the existence of developed, dynamic stock markets is likely to be more conducive to the financing of innovation and R&D than a financial system based mainly on bank lending. The expansion of investment funding via venture capital also appears to be a favourable factor here.

3. Conclusion

The context of structurally weak economic growth and the adverse demographic outlook facing the European economies have kindled renewed interest in a proper understanding of the factors determining development. Numerous studies have been devoted to this subject in recent years. Their results form the background to the broad economic policy guidelines defined by the EU.

This article has tried to identify the main characteristics of potential GDP growth in Belgium, on the basis of observations over the past twenty years. The analysis was conducted in line with the growth accounting method. It is based on the use of an ajusted version of studies of the same type conducted on a harmonised basis by the EC, in order to make maximum use of the statistical information available regarding Belgium.

The estimate of the potential growth rate, and particularly the contribution of the various factors which determine it, are subject to a degree of statistical uncertainty for which allowance should be made. However, significant lessons can be drawn from the developments seen in Belgium since the beginning of the 1980s, especially as they are confirmed by other comparable studies and corroborated by external indicators.

Over the period from 1982 to 2004, the average annual growth of the potential output of the private sector came to 2.2 p.c.; for the economy as a whole, GDP grew by an annual average in the order of 2.1 p.c. This places Belgium in the middle group of European countries,

in common with France and the Netherlands, for example. In the EU-15, there is wide divergence between the countries with the highest potential growth – from 5 to 7 p.c. in Luxembourg and Ireland – and those where it is particularly low, such as Italy and Germany, where it is now estimated at less than 1.5 p.c.

Among the three factors underlying potential growth, capital and total productivity have each contributed an average of almost 1 percentage point to annual growth in Belgium. The growth contribution of the factor labour has been less than 0.5 percentage point during the recent period. Since the mid 1990s, it has also been slightly lower than in the EU-15, owing to a less favourable movement in the employment rate and the population of working age. However, the volume of labour has shown signs of accelerating. On the other hand, in contrast to Europe, the rate of increase in the volume of labour has been decelerating since the mid 1990s in the United States, and is almost down to the European level.

Contrasting trends have also been seen as regards the growth of apparent labour productivity, with a rise of almost one percentage point in the United States and a downward trend in Europe. Belgium, too, has experienced a deceleration in growth, though in the past ten years that has been due mainly to lower capital intensity. After diminishing between 1985 and 1995, the growth of total factor productivity (TFP) – which in principle measures the overall productive capacity of the economy – stabilised at a level above the average TFP growth in Europe, and close to the United States figure. This relatively favourable result could be due to the fairly widespread use of ICT, as investment expenditure on this item is greater than in the majority of European countries. The high level of skills in the labour force is another factor supporting TFP, although its impact has not been quantified for Belgium.

In the face of the adverse trend in the population of working age forecast for the coming decades, it is necessary to continue and reinforce measures to support the volume of labour available in the economy, notably by encouraging increased participation in the labour market. Other levers could also be used in order to stimulate productivity progress. Despite the statistical uncertainty surrounding this type of estimate, empirical studies appear to indicate that expenditure on research and development and efforts to improve the quality of the labour force are the most productive. They are yet more effective if market forces offer appropriate incentives to the economic agents.

Annex

Details of the method used by the Bank to assess potential growth

The method of estimation adopted by the Bank is based on the use of a Cobb-Douglas production function. Potential output is a function of the "potential" level of the three determinants identified by growth theory, namely labour (L), capital (K) and total factor productivity (TFP):

$$Y^* = TFP^* . L^{*^{\alpha}} . K^{*^{(1-\alpha)}} \qquad \text{where * refers to the potential levels.}$$

Although the empirical method of assessing Belgium's potential growth developed by the Bank is based largely on that used by the EC[1], it has nevertheless been adapted in several respects to take greater account of the specific characteristics of the economy or the availability of statistics:
– the production function is applied only to the private sector, as the public sector cannot exert any fundamental influence on the potential path of the economy via its own value added. The production function therefore takes account of the value added of the private sector only, plus labour in the private sector and the capital stock of firms. Up to now, the EC has used a production function for the economy as a whole;
– the data are processed on a quarterly basis, whereas the EC uses annual series only. Quarterly series present the advantage that the smoothing filters are finer, since they are based on a larger number of data. The aggregates are then annualised to ensure an easier readability of the results;
– in contrast to the approach used by the EC which, owing to the availability of statistics in certain countries, can only consider the number of persons in work, the volume of labour relates to the number of hours worked. This prevents the TFP figure from being distorted by changes in working time – whether they be due to the expansion of part-time working, changes in agreed working hours or short-term cyclical movements.

The determinants of the production function used by the Bank are calculated as follows:
– The <u>factor labour</u> (L) is expressed as a potential volume of hours of work in the private sector. It is obtained by taking the potential employment of the private sector, expressed in persons, and multiplying it by the average (smoothed) working time.
  Employment in terms of persons is calculated by eliminating from the overall population of working age:
  – persons who are inactive, taking account of a smoothed (in) activity rate;
  – the structural component of unemployment, considering that it cannot make any direct contribution to output, which is estimated by applying an HP filter to the observed unemployment rate[2];
  – smoothed public employment.
– The observed <u>capital stock</u> (K) is assumed to correspond to the potential capital stock (K*= K). This is a generally accepted assumption in this type of exercise, even though the use of the actual capital stock figure leads to a cyclical component in potential growth. In our method, we limit capital to the capital of firms only.
– <u>Total factor productivity</u> (TFP) is first deduced as a balance from the production function method, taking account of the actual levels of output in the private sector (GDP excluding public sector wages[3]) and the actual inputs (labour in the private sector and capital of the private sector). The potential level of TFP is then calculated by a smoothing process.

The estimated weighting coefficients of the production factors are as follows: 59 p.c. (= α) of the total remuneration of the factors is attributed to labour and the remaining 41 p.c. (= 1 – α) to capital; these are the average coefficients calculated over the period 1981-2003[4].

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(1) Denis et al. (2002).

(2) The European Commission estimates a NAIRU (non-accelerating inflation rate of unemployment) by using a Kalman filter. The results thus obtained are very similar to those arrived at by using an HP filter. For simplicity, we have adopted the latter.

(3) As an approximation of value added in the public sector.

(4) A downward trend in the share of wages in the total factor remuneration is evident throughout the period, falling from 61-62 p.c. at the beginning of the 1980s to 56-57 p.c. at present. The coefficient α used here is lower than that, about 2/3, generally mentioned in the analyses, because the measure of potential growth adopted here relates to the private sector only, rather than the economy as a whole, and the value added of general government consists almost exclusively of remuneration of labour. The figure for the coefficient α which we obtain for the Belgian economy as a whole (private sector and public sector) is 64 p.c. on average for the period 1981-2003, which is close to the figure generally assessed.

By combining the estimate of potential labour, the capital stock and the estimate of potential TFP, we thus obtain the potential output of the private sector. The potential GDP of the economy as a whole is derived by adding public sector wages.

DIAGRAM OF THE METHOD USED BY THE NBB TO ASSESS THE POTENTIAL GROWTH OF THE BELGIAN ECONOMY
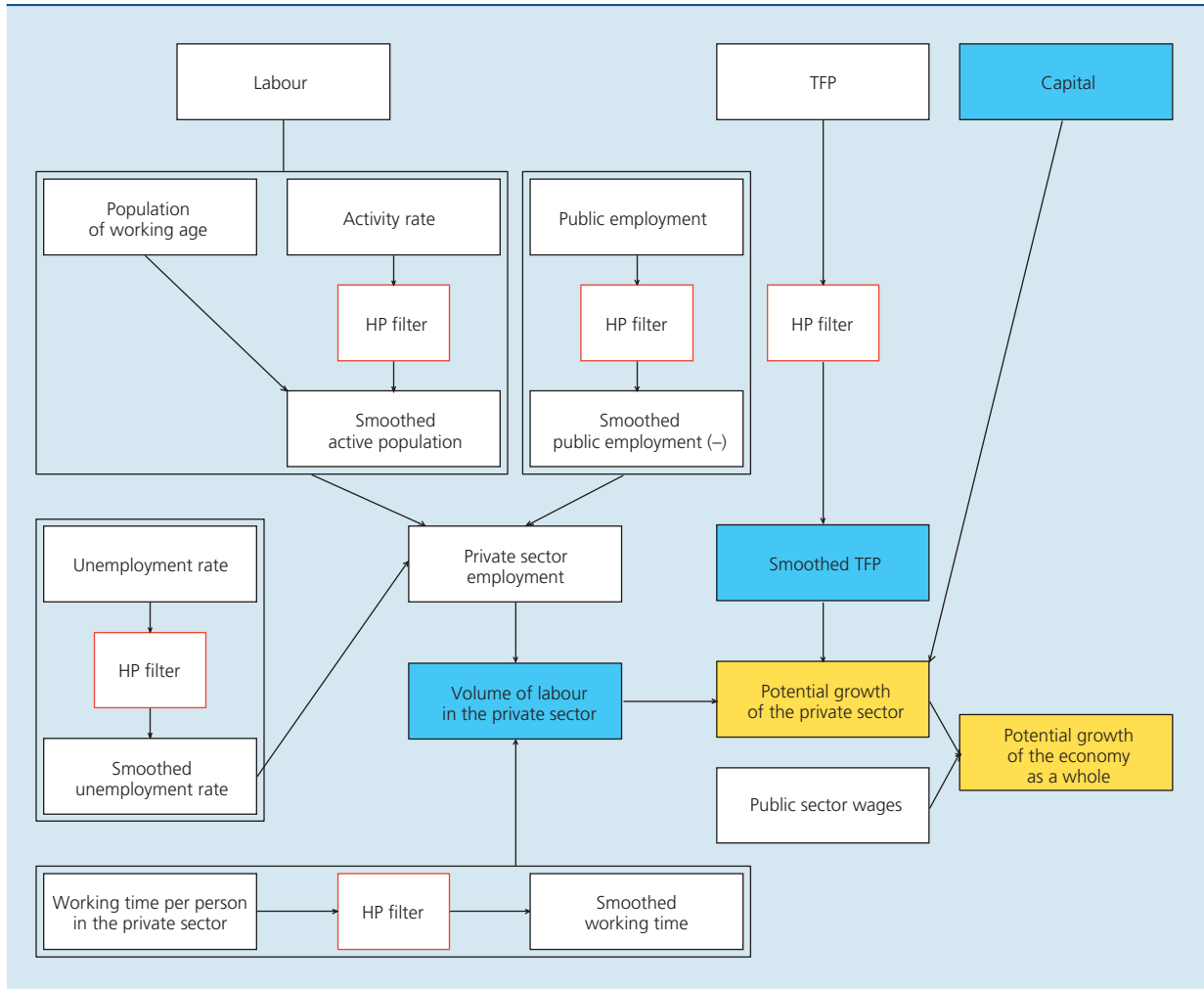
Bibliography

Artus P. and G. Cette (2004), "Productivité et croissance" in *Rapport du Conseil d'Analyse Économique : Productivité et croissance*, 2004 (48).

Cette G., J. Mairesse and Y. Kocoglu (2002), "Diffusion of ICTs and Growth of the French Economy over the Long-term, 1980-2000", *International Productivity Monitor*, spring 2002 (4), 27-37.

Cette G. (2002), "Le choix d'une batterie d'indicateurs de positionnement de l'économie dans le cycle" in Bulletin de la Banque de France 103 (2002), 47-64.

Cette G., J. Mairesse and Y. Kocoglu (2004a), *ICT Diffusion and Potential Output Growth*, Banque de France, Notes d'études et de recherche 112, April 2004.

Cette G., J. Mairesse and Y. Kocoglu (2004b), "L'effet de la diffusion des technologies de l'information et de la communication (TIC) sur la productivité par employé en France" in Bulletin de la Banque de France 121 (2004), 33-46.

Coe D.T. and E. Helpman (1995), "International R&D spillovers", *European Economic Review*, 39 (5), 859-887.

Colecchia A. and P. Schreyer (2002), "La contribution des technologies de l'information et des communications à la croissance économique dans neuf pays de l'OCDE", *Revue économique de l'OCDE*, 2002/1 (34), 165-186.

Colecchia A., J. Melka and L. Nayman (2004), "La qualité du travail, une comparaison internationale", in *Rapport du Conseil d'Analyse Économique : Productivité et croissance*, 2004 (48), 229-244.

De Masi P. R. (1997), *IMF Estimates of Potential Output : Theory and Practice*, International Monetary Fund working paper WP/97/177, December 1997.

Denis C., K. McMorrow and W. Roeger (2002), *Production function approach to calculating potential growth and output gaps – estimates for the EU members states and the US*, European Commission Directorate-General for Economic and Financial Affairs, European Economy, Economic Papers 176, September 2002.

Denis C., K. McMorrow and R. Werner (2004), *An analysis of EU and US productivity developments (a total economy and industry level perspective)*, European Commission Directorate-General for Economic and Financial Affairs, European Economy, Economic Papers 208, July 2004.

Deutsche Bundesbank (1995), "Production potential in Germany and its determinants", *Monthly Report*, August 1995, 39-53.

Deutsche Bundesbank (2003), "The development of production potential in Germany", *Monthly Report*, March 2003, 41-52.

EC (2000), "The contribution of information and communication technologies to growth in Europe and the US : a macroeconomic analysis", *European Economy, Supplement A, Economic trends*, 2000 (12).

ECB (2000), "Potential output growth and output gaps : concepts, uses and estimates", *Monthly Bulletin,* October 2000, 37-48.

ECB (2001), "New technologies and productivity in the euro area", *Monthly Bulletin*, July 2001, 37-48.

European Forecasting Network (2004), "EFN Report – *The euro area and the Lisbon strategy*", autumn 2004.

Federal Planning Bureau (2003), "Estimating potential growth in Belgium", *Quarterly newsletter of the Federal Planning Bureau*, 03 (2), 3-4.

Gelauff G., L. Klomp, Raes S. and T. Roelandt (2004), *Fostering Productivity – Patterns, Determinants and Policy Implications*, Amsterdam, Netherlands, Elsevier.

Groth Ch., M. Gutierrez-Domenech and S. Srinivasan (2004), "Measuring total factor productivity for the United Kingdom", *Bank of England Quarterly Bulletin*, spring 2004, 63-73.

Guarda P. (2002), *Potential output and the output gap in Luxembourg: some alternative methods*, Banque Centrale du Luxembourg, Cahier d'Études 4, June 2002.

Guellec D. and B. van Pottelsberghe de la Potterie (2001), "Recherche-développement et croissance de la productivité: analyse des données d'un panel de 16 pays de l'OCDE", *Revue Économique de l'OCDE*, 2001/II (33), 111-136.

Inklaar R., M. O'Mahony and R-M. Timmer (2003), *ICT and Europe's Productivity Performance Industry-level Growth Account Comparisons with the United States*, Research Memorandum GD-68, University of Groningen, December 2003.

Kegels Ch., M. van Overbeke and W. Van Zandweghe (2002), *ICT contribution to economic performance in Belgium: preliminary evidence – Revision of WP 7-02*, Federal Planning Bureau, working paper 8-02, September 2002.

Nicoletti G. and S. Scarpetta (2003), *Regulation, productivity and growth: OECD evidence*, OECD, Economic Department, working paper 347, January 2003.

OECD (2001), *La nouvelle économie: mythe ou réalité?*, Rapport de l'OCDE sur la croissance, Paris, France.

OECD (2003a), *Les TIC et la croissance économique: panorama des industries, des entreprises et des pays de l'OCDE*, Paris, France.

OECD (2003b), *The sources of economic growth in OECD countries*, Paris, France.

O'Mahony M. and B. van Ark, eds. (2003), *EU productivity and competitiveness: An industry perspective – Can Europe resume the catching-up process?* Office for Official Publications of the European Communities, Luxembourg, 2003.

Oulton N. (2001), *ICT and productivity growth in the United Kingdom*, Bank of England, working paper 140, July 2001.

Schreyer P., P.-E. Bignon and J. Dupont (2003), *OECD capital services estimates: methodology and a first set of results*, OECD statistics working paper 2003/6, December 2003.

Van Ark B., R. Inklaar and R. McGuckin (2002), *Changing Gear: Productivity, ICT and Services: Europe and the United States*, Research Memorandum GD-60, University of Groningen, December 2002.

Van Ark B., M. Timmer and G. Ypma (2003), *IT in the European Union: Driving Productivity Divergence?*, Research Memorandum GD-67, University of Groningen, October 2003.

Van Zandweghe W. (2003), *De macro-economische impact van ICT: economische trendgroei, conjunctuurcyclus en NAIRU*, Federal Planning Bureau, working paper 2-03, February 2003.

Vijselaar F. and R. Albers (2002), *New technologies and productivity growth in the euro area*, European Central Bank, working paper 122, February 2002.

Statistical sources

EC, Ameco database, spring 2005.

EC, Output Gap Working Group (OGWG), Economic Policy Committee.

IMF, World Economic Outlook, April 2005.

GGDC, 60-industry database (February 2005) and Total economy growth accounting database (June 2005);
http://www.ggdc.net/index.html

OECD, Economic Outlook 77, June 2005.

Share prices, house prices and monetary policy

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Introduction

The recent developments in share prices and house prices re-ignited a debate on the place of asset prices in the conduct of monetary policy. Although the central banks do not set any target for these prices, they are not totally indifferent to their fluctuations, since they present risks to financial stability and to the stability of the general price level. The degree to which these movements should be taken into account is still under debate.

The first part of this article sets out the points under discussion, exploring the links between asset prices, macroeconomic developments and monetary policy. In particular, it highlights the possibility of steep increases in asset prices in an environment where the general level of consumer prices is stable, the risk of sudden corrections, and the difficulties facing monetary policymakers in defining an appropriate response.

One of these difficulties lies in identifying an excessive increase in asset prices, or a speculative "bubble". It is illustrated in the second and third parts which assess the recent developments in share prices and property prices respectively. Are these developments likely to worry the monetary authorities, especially in the euro area? Where shares are concerned, the analysis will also consider the United States, in view of the strong correlation between stock market indices on either side of the Atlantic, the fact that euro area residents probably hold a fairly substantial proportion of their assets in the form of American shares, and the advantage that longer series are available for the United States. In the case of property, the analysis will

confine itself to house prices in the euro area and will pay particular attention to a few countries recording pronounced movements, and to Belgium.

In conclusion, the last part will explain how the monetary policy strategy of the Eurosystem takes account of asset price developments.

1. Asset prices, macroeconomic developments and monetary policy

The main goal of the monetary policy of the Eurosystem – and of most central banks at present – is to maintain price stability. That means the stability of the general level of prices of goods and services – measured by the HICP in the euro area – disregarding asset prices. If monetary policy stimulates activity at the expense of price stability, that stimulation is short-lived and is actually counterproductive in the medium term. Nonetheless, monetary policy contributes towards the stabilisation of growth, since it responds to the economic outlook insofar as the business cycle influences the setting of wages and prices. The monetary policymakers therefore respond to the various shocks affecting the economy (arrow A in the diagram) and their decisions influence activity and prices, after long and variable lags, via various channels (arrow B). A widely debated question in recent years has been to what extent a specific reaction to asset price movements is desirable or necessary (arrow C). The answer to this complex question depends on several other questions:
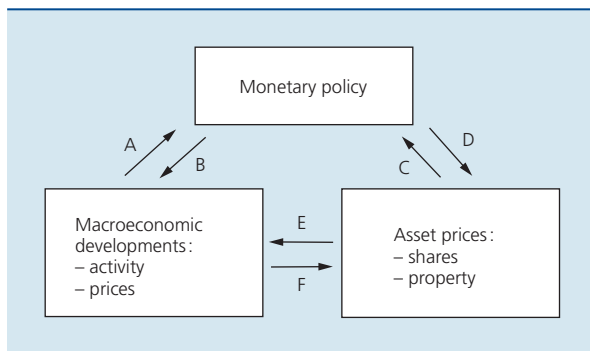
– Do asset prices reflect macroeconomic developments (arrow F), in which case they can at the very least serve as informative variables?
– Is it possible that asset prices are subject to their own dynamics, or even financial "bubbles"?
– To what extent do the monetary authorities have control over movements in asset prices – and therefore carry responsibility for them (arrow D)?
– Finally, what is the effect of asset price fluctuations on macroeconomic developments (arrow E)?

The first three questions concern the determinants of asset price fluctuations, whereas the fourth concerns their implications. After exploring these causes and effects we shall be able to address the question of the appropriate response by monetary policy.

1.1 Causes of asset price fluctuations

Since the specific characteristic of assets is their durability, their prices correspond to the discounted value of income or service flows expected in the future, and therefore depend on the subjective expectations of the economic agents. The subjective element, inseparable from any assessment of future prospects, may be based on an examination of the long-term fundamental determinants, but it may also leave scope for excess optimism or pessimism and overheating, known as "bubbles" because of the way prices are first inflated before "bursting". These excessive movements are sustained by market players whose price expectations are extrapolative, and who hope to make a speedy profit. However, it is extremely difficult, especially in real time, to distinguish between the development of a bubble and a "justified" price rise.

Thus, in the case of **shares**, the factors determining prices are the expected movement in dividends, the return obtained on a risk-free asset, and the assessment of the risk entailed in holding shares, according to the Gordon and Shapiro (1956) formula:

$$P_0 = \sum_{t=1}^{\infty} \frac{D_t^e}{(1 + r + \sigma)^t} \quad (1)$$

where: P_0 is the current share price; D_t^e corresponds to the dividend expected for time t; r equals the nominal return on a risk-free asset, which is assumed to be constant; σ is the risk premium, which is assumed to be constant.

Assuming that the expected dividend growth rate g is constant, this gives us:

$$P_0 = \sum_{t=1}^{\infty} \frac{D_0(1 + g)^t}{(1 + r + \sigma)^t} = \frac{D_0(1 + g)}{r + \sigma - g} \quad (2)$$

in which D_0 represents the last dividend paid.

However, the expected dividend growth rate g and the risk premium σ are subjective elements and cannot be observed directly. The rate of return on "risk-free" assets r can be observed on the government bond market, although excess optimism or pessimism may also occur here, leading to some volatility in r.

Clearly, share prices are influenced by the economic outlook, which they may also help to shape, as we shall see. They therefore contain useful information in that respect, but its reliability is far from certain: the American economist Samuelson once remarked that "Wall Street indices predicted nine out of the last five recessions". Since the level of economic activity, i.e. the degree of pressure on the productive capacities of the economy in the broad sense, influences price movements, stock market indices may also provide useful information for assessing inflation risks. However, they generally have a negative correlation with inflationary expectations. In principle, shares – which are property rights on real assets – should immunise their holders against inflation, which is considered to influence g and r in the same way. However, inflation, especially if it is caused by supply shocks (higher costs), and the disinflation which is expected to follow are generally harmful to corporate profitability.

As in other areas, the influence of monetary policy over share prices depends very much on the credibility of the central bank. Thus, a monetary policy easing in the form of a cut in short-term interest rates will generally tend to bolster share prices: in the first place, it will stimulate economic activity for a while, exerting a positive effect on expected dividend growth; secondly, it may pull long-term

interest rates down as well, reducing the opportunity cost of holding shares and therefore the rate of discounting future dividends; thirdly, it lowers the cost of financing short-term equity investments. Conversely, however, an easing which is interpreted as inflationary will push up long-term interest rates and drive down share prices.

The credibility generally enjoyed by central banks today has prompted observers to reconsider the link between monetary and financial stability. While it is still generally admitted that monetary instability may cause financial instability (since inflation leads to an inefficient alloca-tion of resources, and disinflation – or even deflation – increases the real weight of the debt and may cause a contraction of activity and financial tension), monetary stability still does not preclude marked increases in asset prices followed by sudden falls and financial difficulties. Borio and Lowe (2002) see various reasons for this:
– favourable supply side developments (increased pro-ductivity) may simultaneously exert downward pressure on product prices and upward pressure on asset prices, or even trigger a boom (as in the case of the "new economy");
– the central bank's credibility anchors price expectations and makes them more rigid, moderating at least for a time the inflationary pressure which is normally gener-ated by excessive expansion of demand;
– the very success of monetary policy may create excess optimism;
– by eliminating the need to tighten monetary policy, such conditions allow the imbalances to continue accu-mulating.

In the case of **property**, the factors which operate are similar to those determining share prices. Thus, the price of a house may be viewed as representing the discounted value of future rents. Like share prices, property prices are influenced by the rate of economic growth, owing to its effect on households' disposable income, and by long-term interest rates. However, the housing market differs from the stock market in that it relates to assets which provide services to households, and is less liquid. Apart from households' disposable income and interest rates, many variables determine prices, such as demo-graphic developments, the availability of credit, taxes and subsidies, and supply factors (town and country planning, building costs, etc.)[1].

Monetary policy influences house prices via its impact on economic growth, and hence on households' income, and by its effect on mortgage interest rates, which is more direct if those rates are variable. In contrast to what happens with shares, inflation generally pushes up house prices, since property is seen as a safe haven protecting against monetary erosion. The probability that an easing of monetary policy may cause a price increase is therefore higher than in the case of shares. On the other hand, the stability of the general price level does not prevent the occurrence of steep increases in property prices. Indeed, it is relatively common for such price increases to follow a rise in share prices.

1.2 Influence of asset price fluctuations on macroeconomic developments

An asset price increase may stimulate aggregate demand for goods and services via three main channels: it increases demand for new assets ("Tobin's q"); it exerts wealth effects on consumption; it facilitates credit ("financial accelerator").

First, the increase in the price of existing assets boosts demand for new assets: fixed capital formation by com-panies and housing construction. In the case of shares, Tobin (1969) formulated a theory which states that net corporate investment depends on the market value of the capital compared to its replacement cost[2]:

$$q = \frac{\text{stock market value of the existing capital}}{\text{replacement cost of the existing capital}}$$

The acquisition of an additional unit of capital is profitable so long as its marginal productivity (stock market value, which is equivalent to the discounted value of future dividends) exceeds its marginal cost (replacement cost). Thus, a firm with a q ratio higher than 1 will issue shares to finance its new investments until that ratio is equal to unity. The explanatory power of Tobin's theory remains subject to debate. The theory is perhaps more relevant in economies where it is more common practice to finance companies by issuing quoted shares (United States).

In the case of property, rising prices on the second-hand market generate demand for new housing: an increase in prices in relation to replacement costs (increase in "q") will make it more attractive to build new houses. The increased investment in new housing will exert a positive impact on aggregate demand and stimulate growth.

(1) See ECB (2003) and Baugnet, Cornille and Druant (2003).
(2) In its basic form, Tobin's model contains only one private sector and two assets: the money issued by the government to finance its deficits, and tangible capital. In that context, monetary policy is non-existent as the money supply is equal to the public debt. Finally, in this simplified world, the q ratio could to some extent be interpreted as the ratio between the firm's stock market value and its net accounting value (liabilities minus assets payable).

Secondly, the rise in the value of their assets encourages households to step up their consumption. Current consumption is not only a function of current income but is also influenced by future income [1]. The latter depends on households' overall wealth, which therefore also influences their consumption behaviour [2].

The effect on consumption of an increase in share prices depends partly on the holding of quoted shares by households – a practice which is more widespread in the United States than in Europe – and on whether the increase is seen as permanent.

Households generally hold the major part of their wealth in the form of property. The ultimate effect of a rise in house prices on their consumption will depend on the underlying factor. In contrast to other assets, houses have a use value and provide a service for households. If the price increase is due to an upward valuation of that service – e.g. because of demographic pressure or an increase in rents (and imputed rents) – it will make households richer, but will also increase the cost of consuming the services provided by the housing. Potential buyers and tenants therefore have to save more, hence a decline in their current consumption. For the owners, it is generally considered that the positive wealth effect entailing an increase in consumption, outweighs the negative income effect (of higher imputed rents). However, even if the net wealth effect is zero for the economy as a whole, the redistribution of income resulting from the rise in property prices could influence aggregate demand if the consumption profile of the losers differs from that of the winners. On the other hand, if the rise in house prices is due to a fall in interest rates which persists for some time and is not corresponding to slower growth expectations, a positive net wealth effect becomes more likely. Consumption will actually tend to rise, since the gains made by the owners are not negated by the losses incurred by the potential buyers. It is therefore essential to identify the origin of the economic shock underlying property price fluctuations in order to make an adequate assessment of their impact on aggregate demand.

Finally, the rise in asset prices may exert a positive effect on demand via the credit channel. On the credit market, information is in fact asymmetric. In view of the existence of moral hazard and adverse selection, banks demand guarantees to protect themselves against the risk that the borrower will not repay the loan granted. The rise in asset prices affects those guarantees, attenuates the problem of asymmetric information and therefore makes it easier to arrange credit.

Thus, the value of the guarantees that a company can offer increases as share prices rise, reducing the importance of the adverse selection problem. At the same time, a rise in the company's market value also makes the moral hazard problem less acute – the owners have less incentive to embark on riskier projects since their potential losses, which are confined to the value of the shares which they own in the company, are also higher. The rise in share prices will therefore encourage financial institutions to grant credit more readily and thus finance additional investment.

A rise in house prices has a similar effect. It increases the value of the guarantees that individuals are able to provide for lenders, making access to credit easier. The expansion of credit may in turn fuel further price rises on the housing market or bolster consumption. The scale of the impact on consumption will depend on the ease of obtaining liquidity following the upward valuation of property ("house equity withdrawal"), which in turn depends on the structural characteristics of the mortgage market (transaction costs, loan-to-value ratio, degree of competition). For the banks, a rise in prices on the housing market reduces the risk of default on the part of borrowers. Since they incur lower losses on non-repaid loans, the banks are able to extend more credit without any change in their capital, which may also encourage investment.

The stimulation of aggregate demand by an increase in asset prices may exert inflationary pressure. As already mentioned, however, this can be contained and the danger may lie more in possible deflation once a financial bubble bursts. In particular, a sudden asset depreciation triggers the financial accelerator effect: a decline in asset prices makes the banks far more cautious in their lending. The contraction of credit and activity may be even sharper in the case of a financial crisis characterised by the failure of major institutions.

(1) Modigliani's life cycle theory links consumption to income calculated over a consumer's entire life. Since that income varies during life, households will smooth their consumption by saving while at work and dissaving after retirement. Friedman's permanent income hypothesis considers that income is subject to random and temporary variations. Friedman breaks down consumers' income into two elements: permanent income and transitory income. Consumers expect to maintain the first (a kind of average income) whereas the second is seen as temporary (as a deviation from the average).

(2) See Eugène, Jeanfils and Robert (2003) for an analysis of the Belgian situation.

1.3 How should asset prices be taken into account in the conduct of monetary policy?

Should monetary policy react to sharp fluctuations in asset prices? It seems obvious that the monetary authorities have to take account of the informative value of such fluctuations in the pursuit of their macroeconomic objectives. Thus, at the very least they must respond to a rise in asset prices to the extent that the rise is an advance indicator of the business cycle and of future inflationary pressure – a yardstick which is difficult to define! – and react to a crash in proportion to its impact on activity and prices.

Is it necessary to make a specific response to an increase in asset prices extending beyond its inherent inflation risk? That question is more controversial. In fact, if the risk lies not in inflation but in the accumulation of financial imbalances which could lead to a financial crisis, or even subsequent deflation, then in the short term there could be a conflict between the price stability and growth stabilisation objectives and the aim of financial stability.

In practice, the central banks are alert in varying degrees to the medium- and long-term risks resulting from the accumulation of financial imbalances. In order to weigh up the pros and cons of preventive action in a period of rising asset prices without inflationary pressure, one might start with the optimal conditions for such action and see that, in many cases, a strong dose of judgment is needed on account of the uncertainty.

The first point to check is whether the rise in asset prices is "excessive"; that is no easy task as it is normal for such prices, which incorporate future income prospects, to fluctuate considerably. The nature of the shocks driving up these prices is important: a permanent rise in productivity calls for less response than speculative euphoria (a "bubble"). Supporters of market efficiency reject the idea of a "bubble" and consider that the central bank does not have better information for estimating an "equilibrium value" than the many market operators. The central bank therefore should not concern itself with the setting of these particular prices, but only with the general (consumer) price level. Others, however, take the view that a combination of indicators sometimes permits a fairly certain diagnosis of an excessive increase, and – above all – points to the risk of a financial crisis. If asset prices display a significant and growing deviation from their trend, and there is a simultaneous strong expansion of credit, that would be a fairly reliable indicator here.

When a bubble is forming, it is still necessary to predict how it will develop: will it burst before long, in which case a tightening of monetary policy would be contra-indicated, or is it liable to get larger before bursting?

The costs entailed when the bubble bursts are another reason to act. An abrupt downturn in asset prices is generally followed by a significant slackening of growth (often accompanied by a bank crisis). In this connection, the analysis by Detken and Smets (2004) shows that property market bubbles, which quite often follow stock market bubbles, appear to be the most damaging.

Will action by the central bank be effective? The bubble could be encouraged by a too accommodating monetary policy, causing credit expansion and a rise in asset prices even before inflationary pressure becomes apparent. In that case, a tightening of monetary policy may stop that source of increases. Nonetheless, the impact of a tightening is uncertain and depends on psychological factors. Sometimes, large interest rate hikes would be needed to stop the bubble, in others the tightening may cause a slump in asset prices. The scale of the monetary policy tightening required determines the cost of the action in terms of the short-term restraint on activity or a level of inflation which is below the target.

Finally, one important argument in favour of some response to rising asset prices is that it restores symmetry. The economic agents expect the central bank to compensate for the effects of an asset price fall, therefore attenuating it. This perceived safety net creates a moral hazard problem, which may encourage the formation of bubbles. If the central bank responds symmetrically to excessive variations in asset prices, it limits the risk of having to intervene when the correction takes place and thus of encouraging the creation of new imbalances.

The conduct of monetary policy can therefore be seen as a form of risk management, over a longer or shorter period. Naturally, the ideal conditions for action aimed at preventing the formation or amplification of a financial bubble when hardly any inflationary pressure is present are never fulfilled. It is therefore seldom that decisive action is taken for this purpose alone, given its immediate cost and its uncertain benefits. On the other hand, the monetary authorities generally take account of asset price movements to a limited extent in their deliberations, and may intervene verbally.
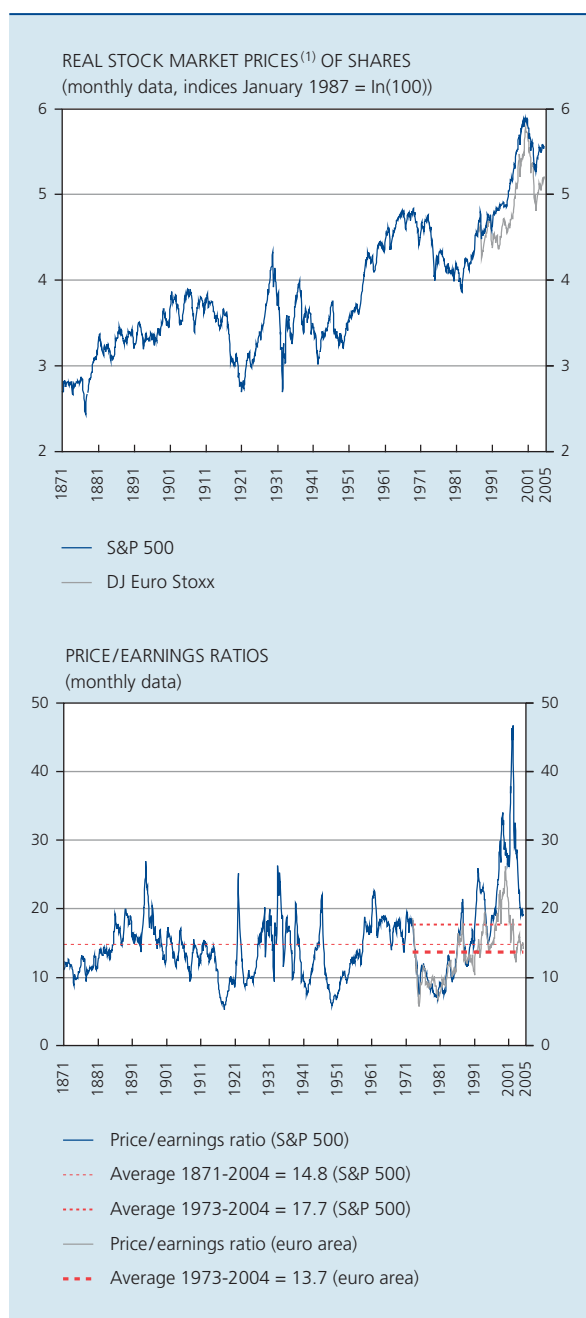
2. Share prices in the United States and in the euro area

In the past twenty years, share prices have fluctuated widely, both in the United States and in the euro area. These movements were fairly similar owing to the increased financial market integration.

Following a sharp fall in late 1987[1], share prices gradually made good their losses so that, by the end of 1989, they had returned to the levels prevailing before the "Black Monday" crash. In the early 1990s, the slowdown in economic activity once again caused share prices to fall; though the fall was less sudden, it was more protracted, especially in the euro area. While share prices subsequently regained momentum, the increases achieved between February 1991 and December 1994 were modest overall, while exhibiting greater volatility on the Old Continent, with annual growth averaging, in real terms, 3.2 p.c. in the United States and 3.9 p.c. in the euro area. From the mid 1990s, there was a fundamental change in the underlying trend and – apart from a weakening caused by the problems with LTCM[2] against the background of the financial crisis in Russia during the second half of 1998 – this marked the start of one of the longest expansion periods ever seen on the stock markets. Between December 1994 and August 2000, the S&P 500 index recorded sustained growth during which share prices almost tripled in real terms, representing an annual increase of almost 20 p.c. over a period of just under six years. In the euro area, prices began their climb from a lower level and slightly later, in March 1995, while they peaked slightly earlier in March 2000, so that the DJ Euro Stoxx index increased by almost 28 p.c. per annum over those five years. The exuberance was gradually dampened by profits warnings, initially originating mainly from companies in the information and communication technology sector, in anticipation of a downturn in economic activity. As so often happens, this was followed by a sudden collapse in prices which some refer to as the bursting of the financial bubble. At the beginning of 2003, share prices on both sides of the Atlantic had reverted in real terms to the levels prevailing at the end of 1996. Nonetheless, after bottoming out in the first quarter of 2003, prices once again began rising rapidly until early 2004, recording growth rates of around 35 p.c. per annum on both sides of the Atlantic.

CHART 1   SHARE PRICES IN THE UNITED STATES AND IN THE EURO AREA

REAL STOCK MARKET PRICES[1] OF SHARES
(monthly data, indices January 1987 = ln(100))

— S&P 500
— DJ Euro Stoxx

PRICE/EARNINGS RATIOS
(monthly data)

— Price/earnings ratio (S&P 500)
····· Average 1871-2004 = 14.8 (S&P 500)
····· Average 1973-2004 = 17.7 (S&P 500)
— Price/earnings ratio (euro area)
- - - Average 1973-2004 = 13.7 (euro area)

Sources: Shiller (2000), Bisciari, Durré and Nyssens (2003), Datastream.
(1) Data deflated by the consumer price index.

However, following this rebound prices stabilised in the United States, whereas between February 2004 and June 2005 they increased at a moderate annual rate of around 7 p.c. in the euro area. The Federal Reserve's progressive withdrawal of the monetary stimulus in the United States and the still wavering economy in the euro area probably contributed to this slowing of the rate of increase in share prices.

Did the steep rise in share prices during the second half of the 1990s represent the formation of a financial bubble? If so, has the bubble collapsed altogether or are shares still overvalued today? There is no unequivocal answer to those questions, as is evident from the analysis of the movement in the prices themselves, the prices in relation to other variables (financial ratios) and the combination of prices and credit aggregates.

Not all sustained price increases necessarily constitute a bubble, defined as a rise based on the expectation of even higher prices tomorrow, whereas the fundamental variables do not seem to justify such increases. As already stated, bubbles are difficult to identify, either ex ante or even ex post. It often happens that favourable developments in the fundamental factors – such as productivity gains, especially if they are regarded as permanent, or interest rates which are expected to remain persistently lower – lead to excessive optimism among market players, generating euphoria on the stock markets. The question then is to what extent rational and irrational factors are both involved. Ex post, not every sharp rise is necessarily followed by a lasting price correction. In particular, in contrast to the market corrections which followed the peaks of September 1929 and February 1937, the 1956 price fall and the 1987 crash did not produce long-lived corrections, so that it is questionable whether they actually represented the bursting of a speculative bubble.

An approach frequently adopted in practice to assess the overvaluation or undervaluation of shares makes use of financial ratios, such as the price/dividend ratio or the price/earnings ratio[1]. The latter, which is most commonly used, can be incorporated as follows in the Gordon and Shapiro formula mentioned earlier (equation 2):

$$\frac{P_0}{E_0} = \frac{D_0}{E_0} \times \frac{1 + g}{r + \sigma - g} \quad (3)$$

in which E_0 represents the last earnings figure.

These ratios are in fact very useful for two reasons: for one thing, they link the movements in share prices to fundamental variables; also, they exhibit a tendency to return to the average over varying periods of time.
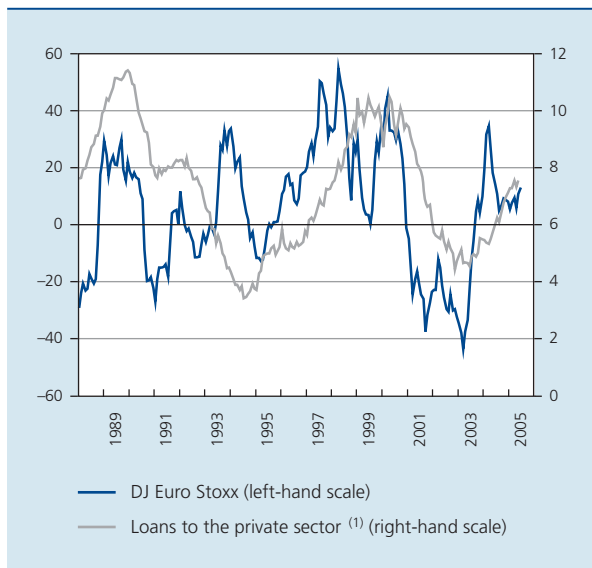
An extreme value for a ratio therefore suggests that either the numerator or the denominator, or both, should be adjusted to restore the ratio to levels closer to its historical average. Nonetheless, the capacity of the ratios to predict future movements in share prices is highly uncertain.

For instance, the historical average of the price/earnings ratio relating to the S&P 500 index, calculated over the period from January 1871 to December 2004, is about 15. That figure is generally taken as the benchmark, indicating that the share is neither too expensive nor too cheap[2]. In September 1929 and August 1987, when the price/earnings ratio stood at 20.2 and 21.4 respectively, it "correctly" indicated that shares were overvalued, thus predicting a fall in prices. The same applied in August 2000, when the price/earnings ratio was 28, although it had fallen below the record for that period (34 in April 1999). In contrast, in February 1937, just before a sharp price correction (the gains of the five years preceding the peak being totally wiped out over the ensuing five years), the price/earnings ratio was only a little higher than the benchmark figure, at 16.8. When the S&P 500 index peaked in July 1956 ahead of an admittedly modest share price correction, the ratio had stood slightly below its historical average, namely at 13.7. Furthermore, there have also been "false alarms", e.g. in December 1921 (25.2), July 1933 (26.3), March 1992 (25.1) or March 2002 (46.2). In the first place, these steep increases were due to a sharp, temporary fall in earnings. In conclusion, while this ratio probably provides an indication of whether share prices are over- or undervalued, it signals the possibility of a correction rather than its exact timing. An extreme value is not an automatic predictor of a collapse in prices.

The use of the financial ratios for prediction purposes presupposes that they continue to fluctuate within a relatively stable range, without remaining at extreme levels for extended periods. Up to the mid 1990s, the price/earnings ratio corresponding to the S&P 500 index appeared to move within a symmetrical range around its historical average. The length and scale of the deviations observed since then are worrying. Although it is not impossible that the long-term "equilibrium value" may have risen somewhat, as a result of a reduction in the risk premium, and although the deviations from that value may prove to be fairly persistent, the high levels reached by the price/earnings ratio at the beginning of 2000 were probably due to a "bubble".

The data relating to the euro area do not go back so far in time. Over the period 1973-2004, price/earnings ratios in the euro area and the United States averaged 13.7 and 17.7 respectively. At the end of the first half of 2005, the

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(1) Tobin's q ratio, already mentioned, can also supply useful information. However, no data are available for the euro area. Bisciari, Durré and Nyssens (2003) show that Tobin's q is better at predicting turning points for American shares than the price/earnings ratio.

(2) This value of 15 is also the average for 1926-1997. For this period it corresponds to the following average values of the variables in equation (3) (see Wibaut, 2000):

D/E = 50 p.c.

r nominal = 5.25 p.c. (r real = 3 p.c.)

g nominal = 4.2 p.c. (g real = 1.9 p.c.)

σ = 2.3 p.c.

3. House prices in the euro area

In the case of house prices it is also extremely difficult to identify a bubble before it has burst. A sharp rise in property prices is not necessarily synonymous with the development of a bubble, especially if the rise is due to a surge in demand for housing, fuelled in turn by a favourable movement in fundamental factors. In the case of the euro area, the identification of a bubble is further complicated by the fact that there are no harmonised national data on average property prices. Therefore, any international comparison – and hence also the interpretation of the weighted average growth rate for the euro area – has to be conducted with caution. The time series relating to the house price index used for the purposes of this article were calculated by the ECB on the basis of national series which have been harmonised as far as possible and relate to the period 1990-2004 [1].

House prices in the euro area rose at an average rate of 7.2 p.c. in 2004, in line with the rises of 6 to 7 p.c. recorded since 2000. However, this period of soaring house prices followed a period of weak price increases averaging 2 p.c. between 1992 and 1998, and may therefore be considered partly as a catching up process.

ratio was close to that average in Europe and still lightly higher across the Atlantic.

Analysis of the expansion of lending can supply useful information for detecting the threat of a crisis. The combination of rapid credit expansion and a sustained rise in share prices, often accompanied by abnormally low spreads between the yields on corporate and government bonds, could presage the accumulation of financial imbalances and thus indicate an increased risk not only of a fall in share prices but also of a contraction in lending, followed by a slowdown of economic growth or even a recession. This mechanism appears to have been a contributory factor, at least in part, to the economic expansion of the late 1980s, which was followed by a downturn in business activity in the early 1990s. More recently, it was probably a factor in the economic and stock market boom of the late 1990s, followed by the slump in 2000. According to this argument, if the credit revival seen since the beginning of 2003 were to accelerate and be accompanied once again by a prolonged and sustained rise in share prices, that would indicate a possible accumulation of imbalances on the stock market.
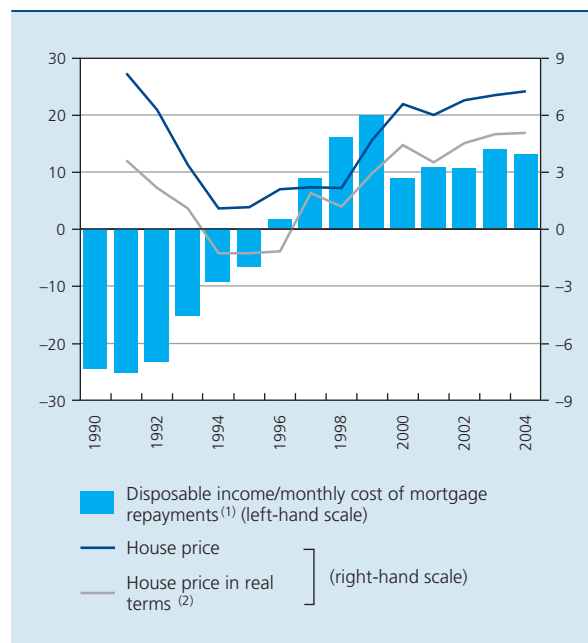
(1) The residual divergences between the national series mainly concern the housing considered (houses and/or apartments, new housing only or all housing taken together) and the method of adjusting for quality variations.

Taking account of inflation in the euro area, the recent rise in property prices (5 p.c. in real terms) is the highest for fourteen years. However, estimates based on less harmonised time series produced by the BIS indicate that the rate of increase has remained well below that of the late 1980s. If history is any guide to the future, there seems to be no immediate danger of a sharp fall in the average rate of increase of property prices in the euro area. The cumulative effect of the increases of the past five years is nonetheless substantial. It is therefore appropriate to check to what extent the recent trends could persist in the longer term.

In this respect, the first step is to compare the movement in house prices with its main determinants. Since the supply of housing is relatively slow to adapt to market conditions, that movement will generally be determined by the demand for housing. The rest of this section concentrates mainly on the influence of disposable income and mortgage interest rates. If a rise in house prices is due primarily to an increase in disposable income and/or a fall in mortgage interest rates, the purchase of a more expensive house will not take up a larger percentage of the household budget, and an average house will therefore still be just as affordable.

A simple yardstick which is often used to assess the affordability of housing is the ratio between disposable income and the monthly cost of mortgage repayments. Between 1991 and 1999, this rough indicator of affordability increased sharply, following the modest rise in house prices and the decline in mortgage interest rates. Since 2000, although house prices have risen much faster than in the 1990s, the continuing decline in mortgage interest rates has largely offset the negative impact on affordability. As a result, over the past five years, affordability has hovered around a level which is still well above the average for the period 1990-2004. There therefore appears to be no question of the property market being generally overvalued in the euro area.

However, two factors shed a different light on this conclusion. First, the exceptionally low interest rate cannot be regarded as permanent, and allowance must be made for the risk of a future increase in mortgage interest rates. Second, house prices in a number of euro area countries have risen much more sharply than the average, so that further research is needed on the possible overvaluation of the housing market in those countries. Both these points will now be examined in more detail before the situation on the Belgian housing market is analysed.

3.1 The risk of an increase in mortgage interest rates

Although it is certainly necessary to bear in mind that the lower mortgage interest rates, compared to the level prevailing in the 1980s, have made housing more affordable, this positive effect must not be taken as entirely permanent. Only part of the fall in mortgage interest rates is structural, namely the part resulting from the increased credibility of monetary policy. In addition, a number of exceptional factors have helped to bring mortgage interest rates down to their current – historically low – level, and this situation is therefore unlikely to persist in the years ahead. Once mortgage interest rates start to rise, the affordability of an average house will decline fairly rapidly, unless the interest rate rise causes the pace of house price inflation to slow down significantly.

To illustrate the impact of a gradual rise in mortgage interest rates, we examine a scenario in which rates increase from 5 p.c. in 2004 to 7 p.c. in 2008. It is also assumed that both house prices and disposable income will continue to rise at the average rate seen over the past six years, namely 6.4 p.c. and 3.7 p.c. respectively. In that scenario, by 2006 the affordability of an average house would already have fallen to the average level prevailing in the period 1990-2004, and by 2008 it would be more than 10 p.c. below that average. To avoid such a reduction in affordability, euro area property prices would need to fall by 0.2 p.c. per annum over the next four years.

The impact of a gradual rise in mortgage interest rates therefore certainly must not be underestimated. On the one hand, heavier mortgage repayments will curb private consumption. This direct effect will apply mainly to individuals who have arranged a variable rate loan and who therefore need to set aside a larger proportion of their income to pay the interest charges. On the other hand, the less buoyant demand for housing will probably moderate the pace of house price rises, and will subsequently restrain consumption and investment through the wealth effect. However, the scale of this indirect effect for the euro area is far more uncertain. Since there are currently no clear signs of general overvaluation of the housing market, the cooling will probably tend to be gradual. Furthermore, empirical studies indicate that, in the large euro area countries, the movement in house prices has hardly any influence on private consumption [1].

(1) See for example Catte et al. (2004).

3.2 The strong surge in house prices in Spain, Ireland and France

In recent years, house price developments have varied greatly between countries in the euro area. In 2004, the average house in Germany was selling at a lower price than in 1998, whereas Spain, Ireland and France, for example, have seen annual increases averaging 10 p.c. or more in the past six years. Belgium is in an intermediate position, with house price rises averaging 6.4 p.c. per annum between 1998 and 2004. However, these wide variations do not necessarily imply that the housing market in Spain, Ireland and France was overvalued in 2004, or that it was undervalued in Germany, as they can be attributed in part to differences in the fundamental macroeconomic factors. Yet it remains questionable whether an annual increase of 10 p.c. or more is ultimately sustainable.

In the euro area, it is Spain that has seen the sharpest rise in house prices in recent years. Although the rate of increase did slow down slightly from 17.6 p.c. in 2003 to 17.3 p.c. in 2004, the trend is still upwards. Between 1998 and 2004, house prices in Spain have risen by an average of 15.3 p.c. per annum. Part of that extremely steep increase can be explained by a number of macroeconomic developments. For instance, the above-average economic growth contributed to an increase in the disposable income of Spanish people, causing demand for housing (both first and second homes) to rise more sharply than in most other euro area countries. In addition, demand was underpinned by the further fall in mortgage interest rates and the greater availability of long-term loans. Martínez Pagés and Maza (2003) show that the low equity returns in recent years have also pushed up house prices. Finally, the price of the average house had risen by only 1.5 p.c. per annum between 1991 and 1998, so that the current price increases may also be seen partly as a catching up process. In Ireland, too, house prices have soared in recent years, while the growth rate in 2004 was slightly below the 2003 level. Although they have risen considerably less fast in the past few years than in the peak year of 1998 (when the increase came to 28.6 p.c.), the price of an average house in Ireland still increased by 13.5 p.c. per annum between 1998 and 2004. The strong economic growth and the continuing fall in mortgage interest rates played an important role here, too. In addition, McQuinn (2004) finds a positive link with the high level of immigration and the banks' greater willingness to grant larger mortgage loans. Finally, in France the sharp rise in house prices is more recent. Following a substantial increase in 1990, the house price index in France hardly rose at all in the ensuing years. It is only since 1998 that the pace of growth has gradually picked
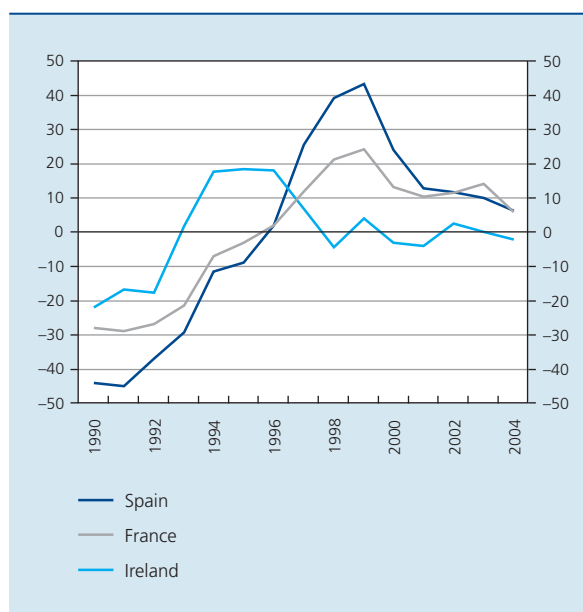
up, reaching 15 p.c. in 2004, the second highest rate in the euro area. The strong demand for housing in France appears to be due mainly to the robust economic growth in the late 1990s and the favourable financing conditions. Combined with slow growth in the supply of housing, this strong demand has exerted upward pressure on the price of an average home in France.

In Spain and France, the affordability of an average house increased significantly for much of the 1990s. Not only did house prices rise more slowly than disposable income, the decline in mortgage interest rates also meant that more individuals could afford to buy a house than had previously been the case. However, since 2000 affordability has declined in both countries, as a result of the stronger rise in house prices. Nonetheless, affordability is currently still above the average level for the period 1990-2004. In Ireland the situation is somewhat different. There, the surge in house prices began earlier, so that the improvement in affordability had already ceased by 1995. After that, affordability declined fairly rapidly as a result of the sustained rise in house prices, and since 1997 it has hovered within a fairly narrow range around the average level for the period 1990-2004.

In each of these three countries, the affordability measure of an average house is currently above or close to the average for the period 1990-2004. The recent movements in the house price index in Spain, France and Ireland therefore do not appear to be a definite indication of an overvalued housing market. However, that conclusion is not always borne out by more complex empirical assessments. Although Bessone, Heitz and Boissinot (2005) deduce that the French housing market is not overvalued (as yet), studies for Spain and Ireland conclude that there are indeed risks associated with the recent price increases. In the case of Ireland, while most models indicate that the housing market is not overvalued, the central bank is nevertheless concerned about the substantial rise in the indebtedness of individuals, which has accompanied the sharp rise in house prices. In the case of Spain, Martínez Pagés and Maza (2003) and Ayuso and Restoy (2003) actually find that the price of an average house was already above its equilibrium value in 2002. The scale of the overvaluation depends very much on the model used, but the deviation is not unusually large, in historical terms, in any of the models. Nonetheless, the economic impact of any house price correction could be significant. Moreover, an assessment of the risks needs to take account of the fact that the mortgage interest rates will probably not remain so low in the future. If an increase in the mortgage interest rates does not coincide with a sufficiently sharp cooling of house prices, the affordability of an average house will soon decline.
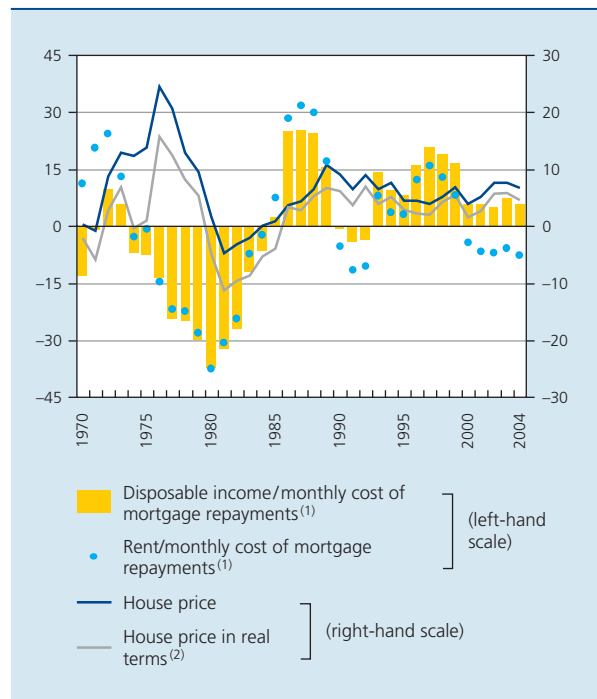
3.3 House price developments in Belgium

In Belgium, the annual increase in the house price index dropped from 7.8 p.c. in 2003 to 6.8 p.c. in 2004. Although the rate of increase in 2004 was above the average for the preceding five years, it was still well below the peak levels attained in 1976 and 1977. During the 1970s and 1980s, the Belgian house price index fluctuated much more widely than in later years. During the first half of the 1970s, the rate of house price rises in Belgium accelerated steadily, culminating in increases averaging over 10 p.c., even after adjustment for inflation, in the period 1976-1978. It was no coincidence that this peak followed a period of very high inflation. Indeed, the latter may have encouraged many individuals at that time to invest in property, considered to offer good protection against a fall in the value of money. A substantial correction followed, mainly caused by a sharp rise in mortgage

interest rates. Since 1990 the annual increase in house prices has fluctuated between 4 p.c. and 9 p.c.

In the past eighteen years, house prices in Belgium have systematically risen faster than the disposable income of individuals. One reason may be the strong demand for housing following the decline in mortgage interest rates, but the scarcity of building land has undoubtedly contributed to growing demand for existing housing. However, the affordability of an average house improved, because the increase in the house price was more than offset by the substantial fall in mortgage interest rates during the 1990s. At the end of the 1990s, an average house was actually more affordable than in the 1970s and 1980s, except for the years 1986-1988. Since then, affordability has declined slightly once again, but in 2004 it was still above the average for the period 1970-2004. The Belgian housing market therefore does not really seem to be overvalued.

A comparison of the movement in rents with that in mortgage loan repayments may also provide an indication of the possible overvaluation of the housing market in Belgium. In the 1970s and 1980s, the ratio between rents and repayments displayed quite considerable fluctuations, which mainly reflected the movements in house prices[1].

CHART 5   HOUSE PRICE DEVELOPMENTS IN BELGIUM

(annual percentage change, unless otherwise stated)

Disposable income/monthly cost of mortgage repayments[1]

Rent/monthly cost of mortgage repayments[1]

(left-hand scale)

House price

House price in real terms[2]

(right-hand scale)

Sources: EC, OECD, Stadim, NBB.
(1) Percentage deviation from the average level for the period 1970-2004.
(2) Data deflated by the deflator of final private consumption expenditure.

(1) Rents generally take quite a time to follow movements on the housing market, as the majority of rents in any given year are covered by existing contracts, and these are only adjusted in line with the consumer price index. Since it is only the rents under new contracts that can be adjusted to the changed situation on the housing market, only very sharp increases in those rents will have an impact on the overall rents index.

A sharp fall in this ratio between 1972 and 1980 was followed by a substantial correction in the ensuing seven years. Since 1990 the ratio between rents and repayments has fluctuated within a relatively narrow range, although in the past few years it has dropped once again. In 2004, it was below the average for the period 1970-2004, indicating that the current situation is not entirely without risk.

Furthermore, the affordability of housing will decline rapidly once mortgage interest rates begin to rise, unless the rate of increase in the house price index slows significantly. The impact on private consumption in Belgium will probably be small, however. Firstly, there are clear limits on the maximum adjustment to interest rates on variable rate mortgage loans, so that the increase in the interest burden for individuals will probably tend to be small. Secondly, Eugène, Jeanfils and Robert (2003) found no indications of any significant wealth effect of house prices in Belgium. Nonetheless, it cannot be excluded that an increase in mortgage interest rates and a house price moderation will have adverse economic consequences.

4. Asset prices and the monetary policy of the Eurosystem

The ECB Governing Council has adopted a monetary policy strategy oriented towards the medium term, featuring anticipatory action based on the analysis of all the available data in a structured framework. Movements in asset prices are therefore closely monitored and they play a role in the decision-making process – without, of course, being a target in themselves[1].

The framework for analysing the risks to price stability comprises an "economic" and a "monetary" pillar. The economic analysis tries to assess the upward and downward pressure exerted on prices in the short and medium term by the interaction between supply and demand and by the cost developments. The macroeconomic projections produced at regular intervals for a two-year horizon take account of the "normal" effects of the movement in asset prices, such as the wealth effects. The risks associated with any financial imbalances are harder to incorporate in the projections, since it is not easy to determine their probability and scale.

The monetary analysis serves primarily to assess the risks to price stability in the medium and long term. Originally, the emphasis was on the growth of M3, as an advance indicator of inflationary pressure, since during the period 1980-1998 there was a fairly stable medium-term link between M3 and consumer prices in the euro area.

However, the very rapid monetary expansion between 2001 and 2003, due mainly to a strong increase in the preference for liquidity in a period of uncertainty, did not generate inflationary pressure. There is no doubt that the monetary aggregates are being increasingly influenced by portfolio reallocations, and that their impact on activity and prices is being felt more via the financial markets. The monetary analysis was therefore extended and refined. On the basis of a series of indicators relating to money and credit, together with indicators of any overvaluation of asset prices, it is possible, in particular, to assess the risk that an expansionary monetary policy may lead to an accumulation of financial imbalances.

As regards the recent movements in asset prices, share prices in the euro area do not appear to be obviously overvalued. However, in the United States the price/earnings ratio still remains high in historical terms, despite the downward trend of the past few years, and a possible drop in American share prices could affect stock markets in the euro area. The fluctuations in house prices are generally less substantial, but could be more damaging. The average increase in house prices in the euro area does not appear excessive, but there is a considerable difference between Germany, where prices are falling, and countries such as Spain, France and Ireland where they are rising strongly. In these last countries, the price increase can be attributed mainly to fundamental factors. However, one of those is the low interest rate which, though partly structural – since the credibility of the Eurosystem renders it unlikely that interest rates will return to the level seen in the 1980s and the early 1990s – could also be to some extent temporary.

The ECB Governing Council therefore has little reason to tighten monetary policy solely in order to control any financial bubble, but it remains vigilant as regards the consequences for liquidity, credit and asset prices – especially house prices – of maintaining interest rates at a low level. Since the common monetary policy cannot be used to solve national problems, national governments can also take measures to counteract domestic house price movements, if they consider them as excessive. For instance, the supply of housing can be stimulated or the tax rules which encourage demand can be changed.

(1) See ECB (2005).

Bibliography

Ayuso J. and F. Restoy (2003), *House prices and rents : An equilibrium asset pricing approach*, Banco de España, working paper 0304.

Baugnet V., D. Cornille and M. Druant (2003), "Le marché belge du logement dans une perspective européenne", *National Bank of Belgium Economic Review,* 2nd quarter, 37-52.

Bessone A.-J., B. Heitz and J. Boissinot (2005), "Are we seeing a bubble on the French housing market ?", *Conjoncture in France*, March, 9-16.

Bisciari P., A. Durré and A. Nyssens (2003), *Stock market valuation in the United States*, NBB, working paper 41.

Bordo M. D. and O. Jeanne (2002), "Monetary policy and asset prices : Does "benign neglect" make sense ?", *International Finance*, 5 (2), 139-164.

Bordo M. D. and C. Wheelock (2004), "Monetary policy and asset prices : A look back at past U.S. stock market booms", *Federal Reserve of St. Louis Review*, 86 (6), 19-44.

Borio C. and Ph. Lowe (2002), *Asset prices, financial and monetary stability : Exploring the nexus*, BIS, working paper 114.

Borio C. and Ph. Lowe (2003), "Monetary policy : A subtle paradigm shift", *World Economics*, 4 (2), 103-119.

Catte P., N. Girouard, R. Price and C. André (2004), "The contribution of housing markets to cyclical resilience", *OECD Economic Studies*, 38.

Central Bank & Financial Services Authority of Ireland (2004), *Financial stability report 2004*, 51-73.

Detken C. and F. Smets (2004), *Asset price booms and monetary policy*, ECB, working paper 364.

ECB (2003), *Structural factors in the EU housing markets*, Frankfurt am Main.

ECB (2005), "Asset price bubbles and monetary policy", *Monthly Bulletin*, April, 47-60.

Eugène B., Ph. Jeanfils and B. Robert (2003), *La consommation privée en Belgique*, NBB, working paper 39.

Goodfriend M. (2000), *Financial stability, deflation and monetary policy*, IMES, discussion paper 2000-E-27.

Gordon M. J. and E. Shapiro (1956), "Capital equipment analysis : The required rate of profit", *Management Science*, 3 (1), 102-110.

Hunter W. C., G. G. Kaufman and M. Pomerleano (eds) (2002), *Asset price bubbles : The implications for monetary, regulatory and international policies*, MIT Press, Cambridge.

Kindleberger Ch. P. (1996), *Manias, panics and crashes : A history of financial crises*, 3rd edition, Macmillan Press, London.

Martínez Pagés J. and L. A. Maza (2003), *Analysis of house prices in Spain*, Banco de España, working paper 0307.

McGrattan E. R. and E. C. Prescott (2004), "The stock market : Irving Fisher was right", *International Economic Review*, 45 (4), 991-1009.

McQuinn K. (2004), *A model of the Irish housing sector*, Central Bank & Financial Services Authority of Ireland, research technical paper 1/RT/04.

Mishkin F. S. (2001), *The transmission mechanism and the role of asset prices in monetary policy*, NBER, working paper 8617.

Moëc G. (2004), "Is there a risk of a property bubble in France ?", *Banque de France Bulletin Digest*, 130, 29-42.

Shiller R. J. (2000), *Irrational exuberance*, Princeton University Press, Princeton, New Jersey.

Stiglitz J. E. (1990), "Symposium on bubbles", *Journal of Economic Perspectives*, 4 (2), 13-18.

Tobin J. (1969), "A general equilibrium approach to monetary theory", *Journal of Money, Credit and Banking*, 1 (1), 15-29.

Wibaut Q. (2000), *Politique monétaire et prix des actifs : Le cas des États-Unis*, NBB, working paper 11.

Pricing behaviour in the euro area: results of a Eurosystem survey

M. Druant*

Introduction

In 2003, the ECB and the twelve national central banks (NCBs) of the Eurosystem set up a temporary network of researchers to examine both pricing behaviour and the scale and causes of inflation persistence in the euro area. Besides a study based on a wide range of quantitative databases, the Eurosystem Inflation Persistence Network (IPN), considered it useful to collect additional information, essentially of a qualitative nature, by organising ad hoc surveys to examine the pricing behaviour of firms[1]. The results of these surveys were analysed in Fabiani et al. (2005); the latter's main findings are briefly summarised in this article.

The surveys are largely based on similar surveys conducted previously in the United States, the United Kingdom and Sweden[2]. They were organised nationally in nine euro area countries by the NCBs of Austria, Belgium, France, Germany, Italy, Luxembourg, the Netherlands, Portugal and Spain and covered more than 11,000 firms (cf. annex for a description of the main characteristics of the surveys in the various countries). Detailed analyses of the national results have been published[3] in a number of countries, including Belgium[4]. The number of participants in the national surveys ranged from 333 in Italy to around 2,000 in Belgium and Spain. While results are only available for industry in Germany and France, firms in the trade sector, other services sectors and/or construction also took part in the survey in the other countries. Overall, 62 p.c. of the participating firms operate in industry, 13 p.c. in trade, 21 p.c. in other services sectors and 4 p.c. in construction. Almost half of them are rather small in size, employing between 1 and 49 workers. 29 p.c. have a workforce numbering 50 to 199, and 24 p.c. employ over 200 people.

The IPN aimed at maximising the harmonisation of the surveys by mutual consultation between the national teams. Nonetheless, a number of specific national characteristics and requirements were also taken into account, both in drawing up the questionnaires and at implementation level. All the surveys were conducted during 2003 and 2004, by mail, phone or the internet. France was the only country where interviews were also conducted. In most countries, these surveys were based on existing samples. Only the NCBs of Luxembourg and Spain constructed a sample specifically for their survey.

Although there are variations between the surveys, particularly in the wording and arrangement of the questions, and although the surveys were conducted in a different way and at different phases of the economic cycle, the results display a large number of common characteristics. Moreover, this finding also applies to Belgium's results which, as will be apparent later, diverge slightly from the average for the euro area only for a small number of aspects. That suggests that the national survey results are decidedly robust and therefore shed significant light on the motives behind the pricing behaviour observed. The results analysed below are therefore an essential complement to the more quantitative research conducted on pricing behaviour, on the one hand, and on the scale and causes of inflation persistence on the other.

1. Main results

1.1 Market structure and competition

Over 70 p.c. of industrial firms reply that the domestic market is the main market for their main product. The substantial disparities in regard to the openness of the economies are reflected in the relatively large dispersion of the percentage of participants naming a foreign country as their main market: that figure ranges from 45 p.c. in Belgium to 15 p.c. in Spain. The Belgian, Luxembourg, Portuguese and Spanish surveys also ask firms to state whether the method of pricing varies according to the geographical destination. That proves to be frequently the case, since around 50 p.c. of firms apply a pricing-to-market strategy. That is a very high percentage, given that the bulk of those countries' exports is destined for trading partners in the euro area, where payments are carried out in a common currency. Furthermore, the surveys conducted in Germany, France, Italy, Luxembourg, Portugal and Spain reveal that other forms of price discrimination are also fairly widespread. On average, for a particular product, 80 p.c. of the participants set prices which may vary according to the customer or the quantity sold.

Sells to other firms account for three-quarters of the turnover, which means that the surveys are primarily assessing producer prices rather than consumer prices. The Belgian percentage (56 p.c.) is well below the euro area average because the trade and construction sectors, which are geared more to the consumer, are heavily represented in the Belgian sample (cf. annex). In view of the dominant position of other firms as the main customers, it is no surprise to find that long-term relationships with customers represent 70 p.c. of turnover.

The level of competition is assessed in various ways in the surveys. The term "perceived competition" is used to designate the indicator which proved to be most closely connected with the pricing method in Fabiani et al (2005). It measures the importance which the participants

TABLE 1 EXTERNAL FACTORS: MARKET STRUCTURE AND COMPETITION

(Percentage)

	AT	BE	DE	ES	FR	IT	LU	NL	PT	Euro area[1]
Main market for main product in industry										
Domestic market	69	55	78	85	64	73	58	72	67	73
Foreign market	31	45	22	15	36	27	42	28	33	27
Main customers										
Other firms	84	56	89	58	66	73	n.	n.	84	75
Consumers	9	40	7	39	30	25	n.	n.	13	21
General government	7	4	4	3	4	2	n.	n.	3	3
Nature of relationship with customers[2]										
Long-term relationship	81	78	57	86	54	98	85	n.	83	70
Occasional customer	19	22	43	14	46	2	15	n.	17	30
Perceived competition[3]										
Very weak	20	18	19	27	19	10	15	5	8	17
Weak	18	22	23	19	17	25	17	25	21	21
Strong	30	30	34	24	38	37	37	49	39	35
Very strong	32	30	24	30	25	29	31	22	32	26
Pricing method										
Mark-up	n.	46	73	52	40	42	n.	56	67	54
Fixed	n.	13	4	n.	n.	n.	n.	27	n.	n.
Variable	n.	33	69	n.	n.	n.	n.	30	n.	n.
Competitors' prices	n.	36	17	27	38	32	n.	22	13	27
Other method	n.	18	10	21	22	26	n.	21	21	18

Source: Fabiani et al. (2005).
(1) The euro area average was calculated by weighting the results of the various countries according to their share in the GDP of the euro area.
(2) For BE, FR and IT, this item concerns only relationships with other firms.
(3) Measured by the importance which the participants attach to their competitors' prices when deciding to cut their own prices.

attach to their competitors' prices when deciding to cut their own prices. Here they can choose from the options "unimportant" (competition perceived as very weak), "of minor importance" (competition perceived as weak), "important" (competition perceived as strong) and "very important" (competition perceived as very strong). The majority of firms feel that the competition is strong or even very strong, but a considerable proportion, totalling 38 p.c., operate on a market where competition is weak or very weak.

In principle, the level of competition is in inverse proportion to the firms' ability to apply a mark-up. In the case of perfect competition, the price always corresponds to the marginal costs, and no mark-up is applied. However, the less competitive the market, the more firms set their prices by adding a mark-up on top of the marginal costs. That proves to be the case in over half of firms in the euro area. In the countries where a distinction can be made between a fixed mark-up and a variable mark-up – Belgium, Germany and the Netherlands – it seems that variable mark-ups are the more common. In the case of Belgium, information is available which indicates that mark-up variability is primarily counter-cyclical [1]. Moreover, 27 p.c. of participants align their prices with those charged by their competitors, which means that they do not have full control over their profit margins. The remaining 18 p.c. use other methods of pricing, e.g. because their price is fixed by the parent company or the government.

As regards the measurement of perceived competition, the results for Belgium tally with those for the euro area as a whole. However, in the case of the pricing method, it appears that the proportion of firms applying a mark-up (46 p.c.) is slightly below the euro area figure, while the proportion of firms setting their prices by reference to the prices charged by their competitors (36 p.c.) is slightly higher in Belgium. It is therefore evident that Belgian firms do have a degree of market power, although it appears to be slightly less than for the euro area as a whole. The openness of the Belgian economy and its relative specialisation in semi-finished products may explain why the environment in which Belgian firms operate is slightly more competitive.

All these findings – the existence of a degree of market power, various forms of price discrimination, and long-term relationships with customers – show that the perfect competition paradigm does not conform to reality. The new-Keynesian literature points out that these differences in relation to perfect competition are essential

if price rigidity is to constitute a (temporary) equilibrium. Price rigidity implies that the aggregate level of prices exhibits a degree of inertia and, under certain conditions, also causes inflation persistence. That is why the surveys pay great attention to the degree of price rigidity and its causes. The results are analysed below.

1.2 When are prices adjusted ?

The results in terms of the frequency of price adjustments indicate a relatively high level of price rigidity. Almost 60 p.c. of the participants review their prices fewer than four times a year, while over 80 p.c. of firms make fewer than four price adjustments annually. It is perfectly logical that prices should be reviewed more frequently than they are adjusted, in view of the specific additional costs associated with price adjustments. Overall, the median European firm only changes its prices once a year. The lowest level of price rigidity is found in trade and the highest level in other services. There are also indications that competition increases price flexibility. Firms perceiving the competition as strong or very strong review and adjust their prices more frequently. While prices are reviewed less frequently in Belgium than in the euro area, the results in terms of actual price adjustments are closer to the euro area average. In Belgium, the median firm also changes its prices once a year.

CHART 1 FIRMS ADJUSTING THEIR PRICES FEWER THAN FOUR TIMES A YEAR
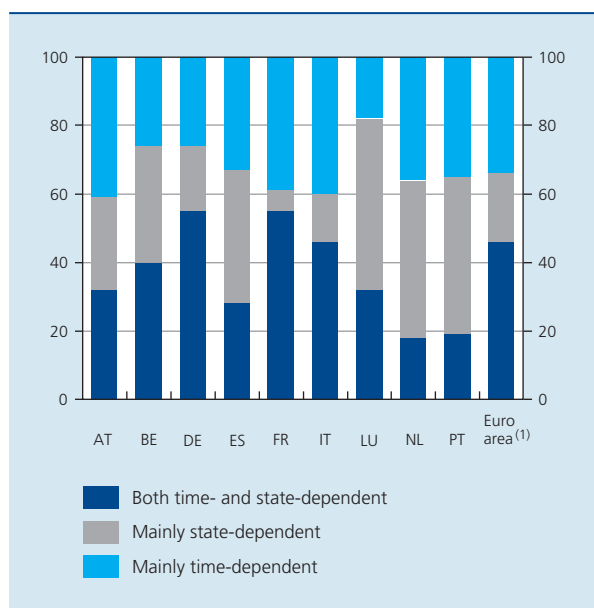(Percentage)
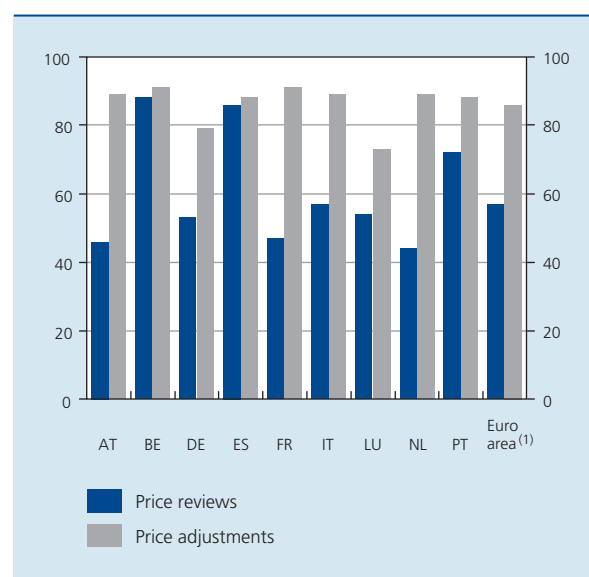
■ Price reviews

■ Price adjustments

Source : Fabiani et al. (2005).
(1) The euro area average was calculated by weighting the results for the nine countries according to their share in the GDP of the euro area.

(1) Cf. Aucremanne and Druant (2004 and 2005) for an analysis of the importance of counter-cyclical movements in mark-ups as a potential source of price rigidity.

CHART 2

Six surveys – conducted in Belgium, Italy, Luxembourg, Austria, Portugal and Spain – ask about the information used in the pricing process, because the less the price decision is geared to the future, the more likely it is to be an additional source of inflation persistence. Half of the firms adopt an optimising strategy, which means that they set their prices on the basis of a complete set of data concerning both in their present and in their expected future operating context. The other half of the participants apply a rule of thumb or base their decision on data which relate to the past or present economic context but offer no indication for the future. In the countries where separate information is available on the use of rules of thumb – namely Belgium, Luxembourg, Portugal and Spain – it emerges that these rules are applied by almost a third of firms. The results of the Belgian survey are slightly different from the average for the six countries. Only 34 p.c. of Belgian firms set prices on the basis of the most complete range of data. On closer examination, this finding proves to be due essentially to the greater weight of the non-industrial sectors in the Belgian survey; in these sectors, the use of rules of thumb and pricing methods which are less geared to the future are more common than in industry.

Source : Fabiani et al. (2005).
(1) The euro area average was calculated by weighting the results for the nine countries according to their share in the GDP of the euro area.

Legend:
- Both time- and state-dependent
- Mainly state-dependent
- Mainly time-dependent

1.3 Why are prices rigid ?

An important advantage of the surveys is that they allow examining the reasons for rigid pricing. All the questionnaires contain a list of potential factors hampering price adjustments, though the length of the list varies from one country to another. The participants were asked to indicate the importance of each factor for their firm [1]. In all countries, the existence of implicit and explicit contracts with the customers is regarded as the main obstacle to price flexibility. This finding tallies with the result previously mentioned concerning the large proportion of turnover (70 p.c.) represented by long-standing customers. The third possible explanation of price rigidity is the flatness of the marginal costs curve, which implies that there is little incentive to adjust prices during the business cycle. Next comes the "kinked demand curve" theory which says that firms are reluctant to be the first to adjust their prices. They prefer to wait for their competitors to take the initiative and then follow suit.

However, this relatively low frequency of price adjustments does not mean that firms are totally insensitive to economic shocks, such as changes in demand or costs. Only 34 p.c. of firms review their prices primarily on a time-dependent basis, i.e. they review their prices at regular intervals regardless of changes in economic conditions. On the other hand, the majority of firms display greater flexibility. They respond immediately to (sufficiently) significant shocks – which means that they always review their prices according to the situation (this applies to 20 p.c. of firms) – or switch from a time-dependent to a state-dependent pricing method when prompted by the economic context (46 p.c.). In Belgium, only 26 p.c. of firms apply mainly time-dependent pricing, a figure slightly below the average for the euro area.

The relatively high degree of price rigidity and the fact that the pricing behaviour may be both time-dependent and state-dependent, are in line with the results published by Dhyne et al. (2005). The latter survey presents the IPN conclusions on the quantitative analysis of the pricing of goods and services included in the consumer price index.

(1) A detailed description of each potential price adjustment obstacle included in table 2 is given in the analysis of the Belgian survey (Aucremanne and Druant (2004)). This survey in fact tested the longest list of potential explanatory factors.

TABLE 2   RANKING OF POSSIBLE EXPLANATIONS FOR PRICE RIGIDITY

(Average scores)

	AT	BE	DE	ES	FR	IT	LU	NL	PT	Euro area[1]
Implicit contracts	3.0	2.5	n.	2.6	2.2	n.	2.7	2.7	3.1	2.7
Explicit contracts	3.0	2.4	2.4	2.3	2.7	2.6	2.8	2.5	2.6	2.6
Flat marginal costs curve	2.6	2.4	n.	n.	2.5	n.	2.7	n.	2.7	2.6
Kinked demand curve	2.3	2.2	2.2	2.4	3.0	2.6	2.1	2.2	2.8	2.4
Quality judged according to price	1.9	1.9	n.	1.8	n.	n.	2.2	2.4	2.3	2.1
Risk of having to adjust the price subsequently in the opposite direction	1.5	1.8	1.9	1.8	2.1	2.0	1.7	2.4	2.5	2.0
Adjustments to elements other than price	1.7	1.7	n.	1.3	n.	n.	1.9	1.9	n.	1.7
Menu costs	1.5	1.5	1.4	1.4	1.4	1.6	1.8	1.7	1.9	1.6
Information gathering costs	1.6	1.6	n.	1.3	n.	n.	1.8	n.	1.7	1.6
Psychological price thresholds	1.3	1.7	n.	1.5	1.6	1.4	1.8	1.8	1.8	1.6

Source: Fabiani et al. (2005).
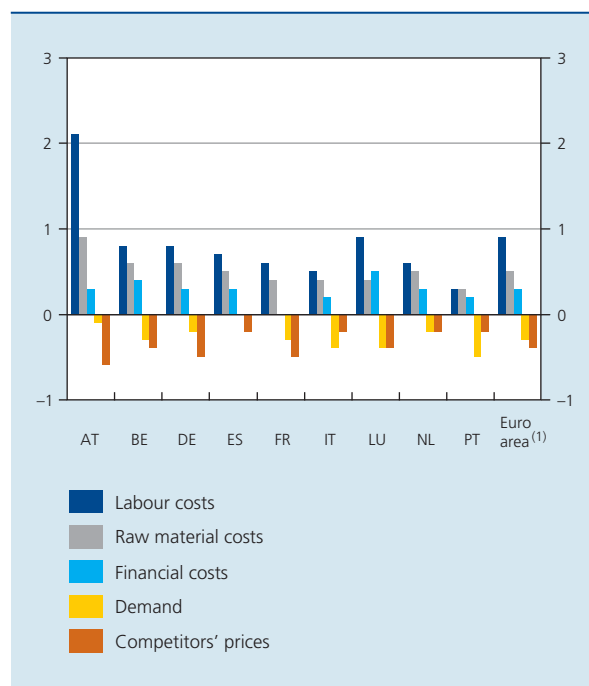(1) Unweighted average of results by country.

Next, it seems that a price cut may be hampered by its possible association with a reduction in product quality. Another potential factor in price rigidity is, to some extent, the risk of having to adjust the price subsequently in the opposite direction. Moreover, the surveys reveal that some explanations which are frequently put forward in the economic literature play only a minor role in practice. This applies to menu costs – the total of costs linked to price adjustments, by analogy with the necessary adaptations of menu cards in restaurants –, costs linked to the gathering of information relevant to pricing and the use of psychological price thresholds.

1.4 Assymetries in pricing behaviour

The surveys conducted in the various countries consistently show that the importance of the factors prompting a price adjustment differ according to whether the price is being increased or cut. Changes in costs – namely labour costs, cost of raw materials and, to a lesser extent, financial charges – are clearly more important for price increases than for price cuts. On the other hand, changes in market conditions, especially demand fluctuations and the prices charged by competitors, play a greater role in the case of price cuts.

CHART 3   ASYMMETRIES IN THE REASONS
FOR ADJUSTING PRICES

(Difference between the average scores for price rises
and price cuts)

Source: Fabiani et al. (2005).
(1) Unweighted average of the results by country.

The level of competition influences the degree to which firms respond to changes in the underlying factors. Firms operating in a competitive environment respond more strongly to changes in the cost of raw materials and financial charges, and to demand fluctuations. Conversely, the response to changes in labour costs is the same, whatever the perceived level of competition. The reason may be that, in most countries, wage adjustments are agreed by collective bargaining and therefore affect all firms in a particular sector to the same degree.

2. Conclusion

This article presents the results of the surveys on pricing behaviour covering more than 11,000 firms in nine euro area countries. Despite the methodological differences between the surveys, the results are similar in many respects. They are therefore decidedly robust and provide a valuable insight into the reasons behind the pricing behaviour observed, in a way that more quantitative data do not. Moreover, the relatively high degree of price rigidity revealed by the surveys, and the fact that pricing behaviour may be both time-dependent and state-dependent, are in line with the IPN conclusions on the quantitative analysis of the pricing behaviour.

Furthermore, the survey shows that the environment in which European firms operate is significantly different from a perfect competition situation and that, in line with the basic premises of the new-Keynesian literature, firms do have a degree of market power and apply various forms of price discrimination. In addition, it is evident that cost changes are more important for price increases than for price cuts, whereas changes in market conditions have a greater influence in the case of price cuts. The factors explaining price rigidity mainly concern the existence of implicit and explicit contracts, whereas the menu costs and information gathering costs are not regarded as a major obstacles to price adjustments. The flatness of the marginal costs curve and the fact that firms are reluctant to be the first to change their prices are also seen as important impediments to price adjustment.

Bibliography

Angeloni I., L. Aucremanne, M. Ehrmann, J. Gali, A. Levin and F. Smets (2004), *Inflation persistence in the euro area : preliminary summary of findings*, (www.ecb.int).

Apel M., R. Friberg and K. Hallsten (2005), "Microfoundations of macroeconomic price adjustment : survey evidence from Swedish firms", *Journal of Money Credit and Banking*, 37 (2), 313-338.

Aucremanne L. and M. Druant (2004), "Price-setting behaviour in Belgium : what can be learned from an ad hoc survey ?", *National Bank of Belgium Economic Review*, 4, 17-48.

Aucremanne L. and M. Druant (2005), *Price-setting behaviour in Belgium : what can be learned from an ad hoc survey ?*, National Bank of Belgium Working Paper No. 65 – Research Series, March.

Blinder A.S., E. Canetti, D.E. Lebow and J.B. Rudd (1998), *Asking about prices : a new approach to understanding price stickiness*, New York, Russell Sage Foundation.

Dhyne E., L.J. Alvarez, H. Le Bihan, G. Veronese, D. Dias, J. Hoffman, N. Jonker, P. Lünnemann, F. Rumler and J. Vilmunen (2005), *Price setting in the euro area : some stylized facts from individual consumer price data*, ECB Working Paper series, forthcoming.

Fabiani S., A. Gattulli and R. Sabbatini (2004), *The pricing behaviour of Italian firms : new survey evidence on price stickiness*, ECB Working Paper series No. 333, April.

Fabiani S., M. Druant, I. Hernando, C. Kwapil, B. Landau, C. Loupias, F. Martins, T. Mathä, R. Sabbatini, H. Stahl and A. Stokman (2005), *The pricing behaviour of firms in the euro area : new survey evidence*, ECB Working Paper series, forthcoming.

Hall S., M. Walsh and A. Yates (2000), "Are UK companies' prices sticky ?", *Oxford Economic Papers*, 52, 425-446.

Kwapil C., J. Baumgartner and J. Scharler (2005), *The price-setting behaviour of Austrian firms : some survey evidence*, ECB Working Paper series No. 464, March.

Loupias C. and R. Ricart (2004), *Price setting in France : new evidence from survey data*, ECB Working Paper series No. 423, December.

Annex: Description of the surveys

	Conduct of the surveys		Sample	Number of firms in the sample / Response rate	Sectors covered[1] (percentage)	Size class[2] (percentage)	Reference market
	When?	Who and how?					
AT	January-February 2004	external (WIFO) by mail	WIFO's existing business survey sample	2,500 / 36 p.c.	I:76 OS:24	I:53 II:28 III:19	main market
BE	February 2004	National Bank of Belgium by mail	National Bank of Belgium's existing business survey sample	5,600 / 35 p.c.	I:38 T:24 OS:18 CON:20	I:75 II:17 III:8	main market
DE	June-July 2004	external (IFO) by mail	IFO's existing business survey sample	2,740 / 46 p.c.	I:100	I:29 II:35 III:36	domestic market
ES	May-September 2004	external by mail with prior telephone contact	sample constructed by Banco de España	3,000 / 69 p.c.	I:44 T:26 OS:30	I:42 II:23 III:35	main market
FR	December 2003 – February 2004	Banque de France branches, by mail with prior telephone contact, by telephone or interview	Banque de France's existing business survey sample	4,300 / 38 p.c.	I:100	I:18 II:43 III:39	domestic market
IT	February-March 2003	external (Poster s.r.l.) mainly via Internet with prior telephone contact	sample based on existing sample for Banca d'Italia survey of inflation expectations	729 / 46 p.c.	I:65 T:14 OS:20 CON:1	II:39 III:61	main market
LU	August-November 2004	Banque centrale du Luxembourg by mail	sample constructed by Statec	1,100 / 30 p.c.	I:20 T:22 OS:37 CON:22	I:46 II:43 III:11	domestic market
NL	May 2004	external (TNS-NIPO) by Internet	sample based on a panel of business leaders	1,870 / 67 p.c.	I:18 T:22 OS:60	I:81 II:19[4]	not specified
PT	May-September 2004	Banco de Portugal by mail	annual accounts data base of Banco de Portugal	2,494 / 55 p.c.	I:84 OS:16	I:39 II:38 III:23	not specified
Euro area[3]	–	–	–	–	I:62 T:13 OS:21 CON:4	I:47 II:29 III:24	–

Source: Fabiani et al. (2005).
(1) I: industry; T: trade; OS: other services; CON: construction.
(2) I: 1-49 workers; II: 50-199 workers; III: 200 or more workers.
(3) The euro area average is obtained by calculating the total number of firms per category for the nine countries together.
(4) In the Netherlands it is not possible to distinguish between size classes II and III.

Social security finances

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Introduction

One of the government's main functions is to protect the population against a number of social risks. Hence, replacement incomes are provided in the event of unemployment, old age, or occupational disability. In addition, income supplements are granted to compensate in part for the financial burden associated, in particular, with illness or with bringing up children. These social benefits are an important facet of the redistribution of income effected by the government.

In Belgium, social protection is provided mainly by the social security sub-sector. This is the largest component of the general government sector, so that it exerts a substantial influence on the evolution of public finances.

The first part of this article gives a general presentation of social security. It outlines the major developments in social security receipts and expenditure, and those concerning the social security financial balance and debt. The social benefits granted by other levels of government and by other European Union countries are also discussed. In particular, the effectiveness of social policies in combating poverty is judged against the results achieved by other countries. The second part of the article offers a more detailed analysis of social security receipts, presenting the pattern and structure of receipts together with the differences in funding methods between the system for employees and that for self-employed persons. The third part of this article focuses on social security expenditure. Apart from the structural changes observed in the past and the long-term projections for social benefits, this part also deals with the determinants of the main categories

of social security expenditure: health care, pensions, unemployment benefits, early retirement pensions, career breaks and reductions in working time and family allowances. Finally, the main conclusions are summarised.

1. Social security: general situation[2]

1.1 The main aggregates of the social security accounts: importance and trends
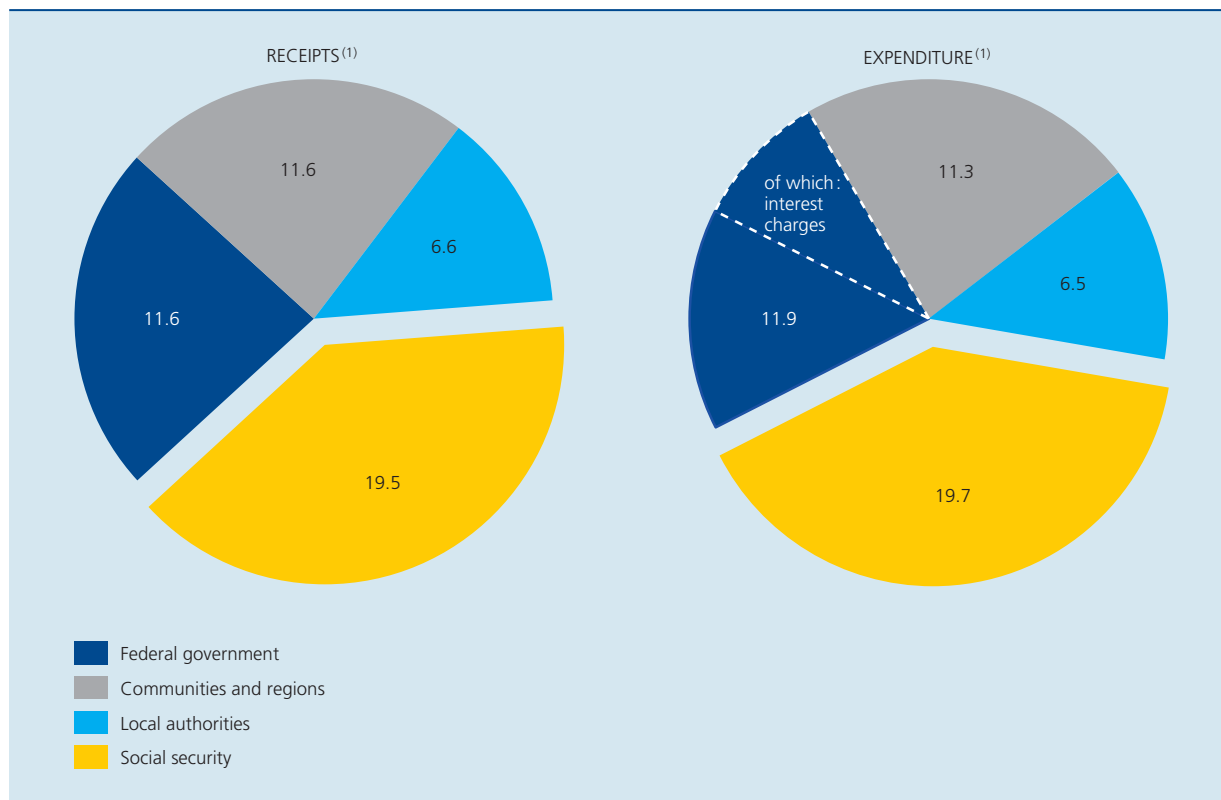
In 2004, social security receipts and expenditure (on a consolidated basis) totalled respectively 19.5 and 19.7 p.c. of GDP. Social security thus represented nearly 40 p.c. of all government receipts and expenditure, making it the largest sub-sector, ahead of the federal government and the sub-sector combining the communities and regions – which each accounted for just under a quarter of total receipts and expenditure – and the local authorities. Looking at primary expenditure only, i.e. expenditure excluding interest charges, social security even represented 44 p.c. of the total expenditure of general government.

However, the current level of social security receipts and expenditure is very different from what it was at the beginning of the 1970s, when the figures were 12 and 13 p.c. of GDP respectively. The rapid increase in unemployment, the growth of health care spending and the increases in certain benefits such as pensions,

CHART 1

CHART 1   RECEIPTS AND EXPENDITURE OF THE GENERAL GOVERNMENT SUB-SECTORS

(percentages of GDP, 2004)

RECEIPTS[1]

EXPENDITURE[1]

11.6

11.6

6.6

19.5

of which :
interest
charges

11.3

11.9

6.5

19.7

- Federal government
- Communities and regions
- Local authorities
- Social security

Sources : NAI, NBB.

(1) Receipts and expenditure are consolidated by deducting from the receipts and expenditure of each government sub-sector the transfers made to other sub-sectors.
On a non-consolidated basis, the approach adopted for the rest of this article, social security receipts and expenditure totalled respectively 19.6 and 19.7 p.c. of GDP in 2004.

for example, contributed to the strong expansion of social security expenditure in the 1970s and early 1980s. In 1983, expenditure reached almost 22 p.c. of GDP. Receipts attained a similar level following measures to increase the contributions and the transfers from the federal government. The period of consolidation in the following years reduced the weight of social security to around 18 p.c. of GDP in 1990. Although budget discipline was relaxed for a short time in the early 1990s, that was soon followed by a further period of fiscal consolidation, partly related to the efforts to achieve the objectives required for joining the Economic and Monetary Union, so that, in 2000, social security receipts and expenditure had broadly returned to the same level as in the early 1990s. In the past few years they have resumed an upward trend.

Throughout the period from 1970 to 2004, social security receipts and expenditure moved very much in parallel. That parallelism is reflected in the minor fluctuations in the financial balance of social security, which ranged
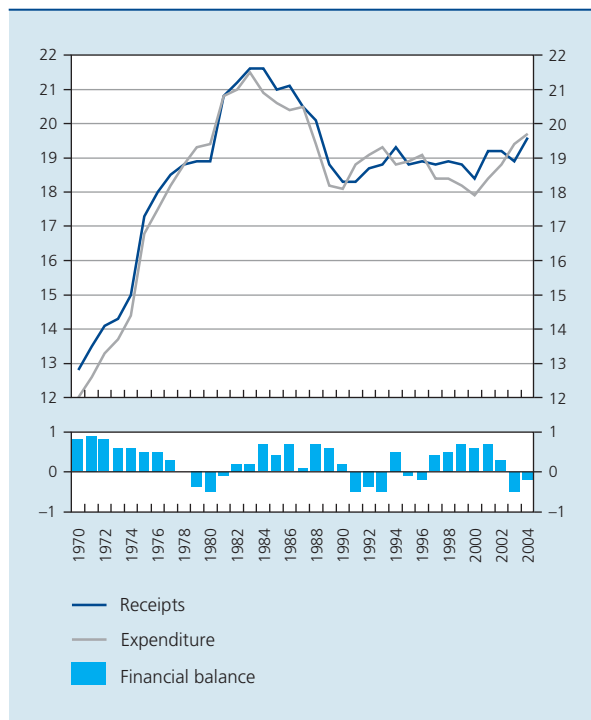
between a deficit of 0.5 p.c. of GDP and a surplus of 1 p.c. In 2004, the financial balance showed a small deficit of 0.1 p.c. of GDP.

As a result of this generally favourable evolution of the financial balance, the consolidated gross debt of social security has always remained relatively small. That debt peaked at 1.3 p.c. of GDP in 1995 and has since declined steadily. In 2001, the residual social security debt totalling 0.5 p.c. of GDP was taken over by the federal government in compensation for a reduction in the alternative funding[1]. Since then, social security has accumulated hardly any further debts.

Moreover, social security has a large portfolio of financial assets. The coexistence of debts and financial assets in the social security accounts is due partly to the fact that, before the introduction of "overall management"

(1) In regard to the scheme for employees, there was a single cut in the alternative funding in the same year ; in the case of the scheme for self-employed persons, the cut was spread over several years.

CHART 2 RECEIPTS, EXPENDITURE AND FINANCIAL
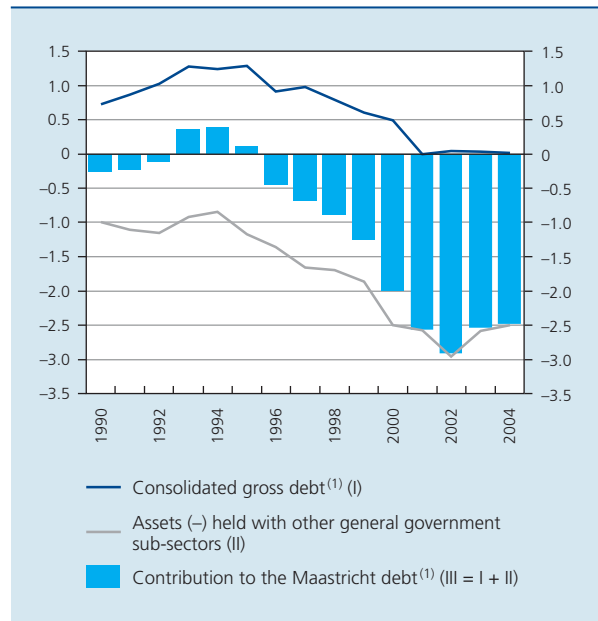BALANCE OF SOCIAL SECURITY

(percentages of GDP)

Sources : NAI, NBB.

CHART 3 SOCIAL SECURITY DEBT

(percentages of GDP)

Consolidated gross debt[1] (I)

Assets (–) held with other general government
sub-sectors (II)

Contribution to the Maastricht debt[1] (III = I + II)
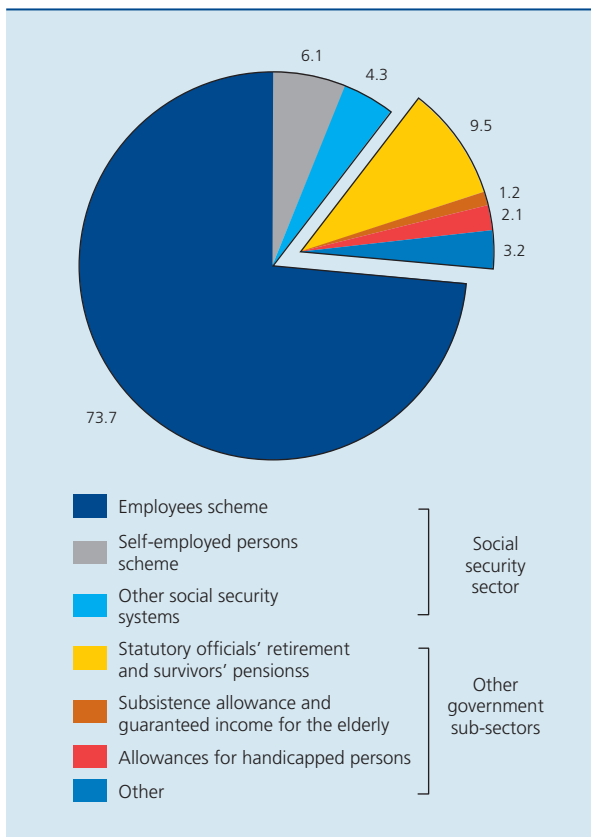
Sources : NAI, NBB.

(1) The consolidated gross debt of social security is calculated by deducting the
debts for which the counterparty is an institution in the same sub-sector
(intra-sectoral consolidation). To obtain the latter's contribution to the
Maastricht debt, the liabilities corresponding to an asset of another government
sub-sector are deducted from the consolidated gross debt (inter-sectoral
consolidation).

in 1995, the various branches of social security were managed separately. Some branches had therefore accumulated a debt while others had regularly produced a budget surplus, and had therefore acquired a portfolio of assets. Insofar as these assets consist of government securities, they are deducted from the gross debt when calculating the debt figure used as a reference for the Maastricht Treaty criteria.

Since 1996, social security has contributed to the reduction in the level of the Maastricht debt. From 1996 to 2002 this favourable contribution showed a marked increase, on account of the budget surpluses achieved during that period and the corresponding increase in the volume of assets held on the other general government sub-sectors, which represented 2.9 p.c. of GDP in 2002. The deficits of the past two years, though small, have led to a reduction in the assets held by social security, so that the favourable contribution made by this sub-sector to the Maastricht debt declined to around 2.5 p.c. of GDP in 2004.

1.2 Social protection expenditure of general government

Not all the social provision made by the government is arranged through the social security sub-sector. Thus, the other levels of government generally pay their statutory officials' pensions and family allowances themselves. Furthermore, the federal government is responsible for paying allowances for handicapped persons, while the subsistence allowance is a social benefit paid by local authorities, though admittedly it is partly covered by federal government transfers. In 2004, social benefits which are not paid via social security made up 15.9 p.c. of the social benefits paid by general government. Retirement pensions and survivors' pensions of other government sub-sectors represented all of 9.5 percentage points.

Social security benefits, which accounted for 84.1 p.c. of total social provision in 2004, are paid mainly through the scheme for employees. In 2004, this scheme accounted for almost three-quarters of all social benefits, whereas the scheme for the self-employed represented 6.1 p.c. and the share of other – smaller – social security schemes, such as overseas social security, the provincial and local public service scheme, the subsistence funds,

CHART 4

CHART 4   SOCIAL BENEFITS PAID BY GENERAL
GOVERNMENT

(percentages of the total, 2004)

6.1
4.3
9.5
1.2
2.1
3.2
73.7

- Employees scheme
- Self-employed persons scheme
- Other social security systems

Social security sector

- Statutory officials' retirement and survivors' pensionss
- Subsistence allowance and guaranteed income for the elderly
- Allowances for handicapped persons
- Other

Other government sub-sectors

Sources: NAI, NBB.

the Compensation Fund for workers made redundant as a result of business closure and the Vlaams Zorgfonds (Flemish Elderly Care Fund) came to 4.3 p.c.
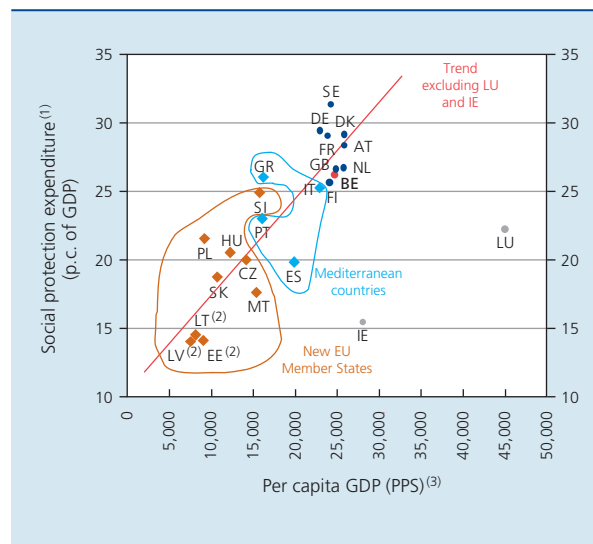
1.3 International comparison

International comparisons of social protection expenditure must be treated with caution. Some studies, such as those conducted by the European Commission (2004a), take account of not only public social protection expenditure but also mandatory private expenditure, consisting mainly of private health insurance and second pillar pensions. Conversely, the OECD (2004) limits the scope of the data to public expenditure in this area. A second point concerns the differences between countries in the way that social

(1) The definition of public social protection expenditure used by the OECD is broader than that used by the NAI in drawing up the national accounts. Among other things, it takes account of pensions paid by the Post Office and Belgacom, companies which – according to the national accounts methodology – do not belong to the government sector. In addition, certain social protection expenditure items are classified in different categories in the national accounts and according to the OECD methodology.

protection is organised. Thus, while social protection expenditure mainly comes under social security in Belgium, that is not the case in all European countries. In Denmark, for example, social security pays only around 15 p.c. of social benefits, which are mainly the responsibility of the local authorities. It would therefore make no sense to consider social security expenditure only, and it is more appropriate to compare the social benefits paid by all public authorities together. Finally, the gross data used in international comparisons omit both the effect of taxation and parafiscal levies – which may weigh to a greater or lesser extent on the social benefits actually received by beneficiaries – and the effect of fiscal expenditure in the form of tax credits or other fiscal benefits. Nonetheless, some lessons may be drawn from international comparisons, which in this article relate to 2001 or 2002, the latest years for which data were available.

According to the OECD definition[1], gross expenditure on social protection by all public authorities totalled 27.2 p.c. of GDP in Belgium in 2001; that was more than three percentage points higher than the EU-15 average. The level of public expenditure on social protection is highest in Denmark, where it totals 29.2 p.c. of GDP, and lowest in Ireland at 13.8 p.c. of GDP.

CHART 5   SOCIAL PROTECTION EXPENDITURE[1]
AND PER CAPITA GDP

(2002, unless otherwise stated)

Social protection expenditure[1] (p.c. of GDP)

Per capita GDP (PPS)[3]

Trend excluding LU and IE

Mediterranean countries

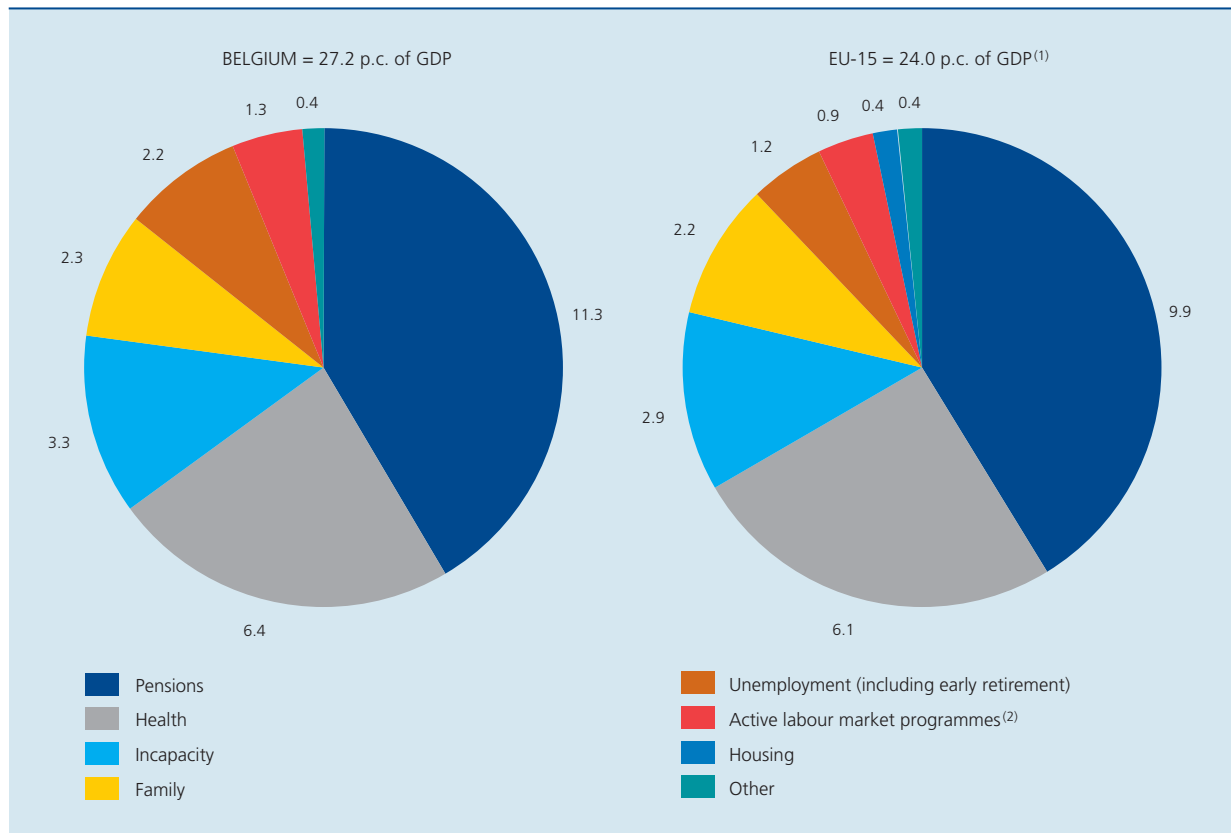New EU Member States

Sources: EC, NBB.
(1) Including mandatory private expenditure.
(2) 2001.
(3) Purchasing power standards (PPS) take account of the respective price levels in the Member States and of exchange rates.

CHART 6   SOCIAL PROTECTION EXPENDITURE OF GENERAL GOVERNMENT
(percentages of GDP, 2001)

BELGIUM = 27.2 p.c. of GDP

1.3   0.4
2.2
2.3
3.3
6.4
11.3

EU-15 = 24.0 p.c. of GDP[1]

0.9   0.4   0.4
1.2
2.2
2.9
6.1
9.9

- Pensions
- Health
- Incapacity
- Family
- Unemployment (including early retirement)
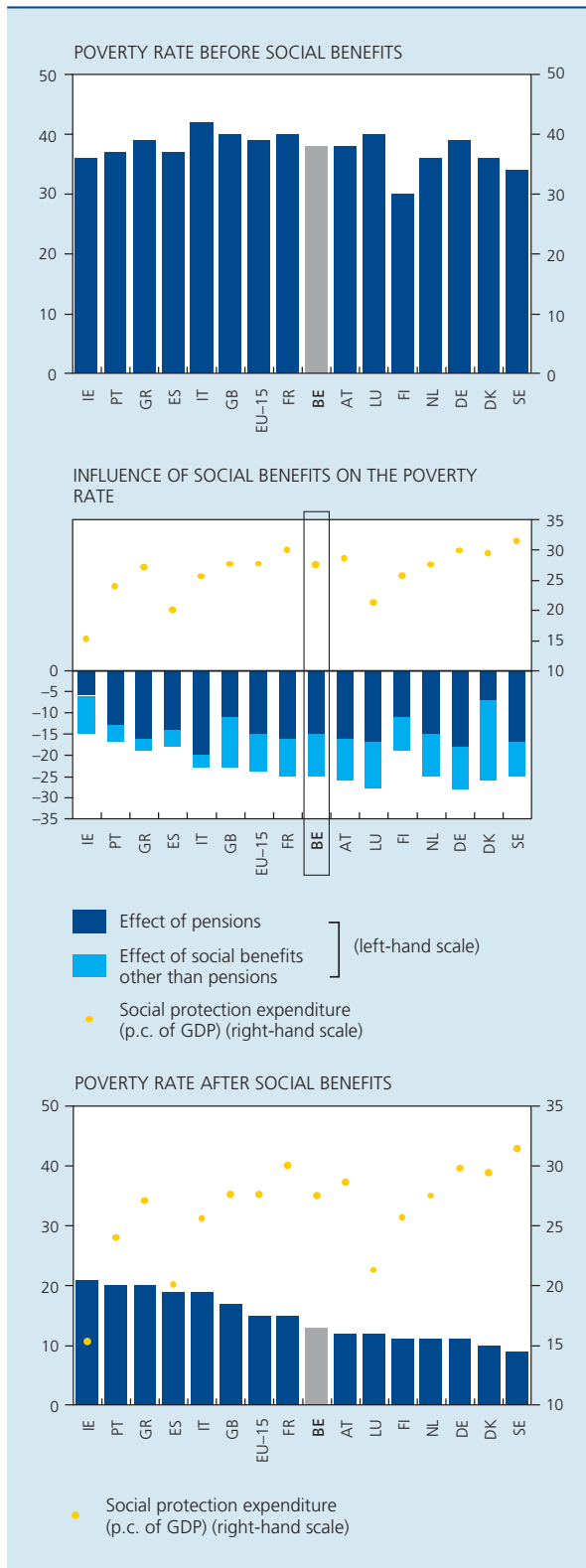- Active labour market programmes[2]
- Housing
- Other

Source : OECD.
(1) Unweighted average.
(2) Including career break allowances and time credit.

The differences between Belgian public expenditure on social protection and the European average are due essentially to a few specific expenditure categories. Thus, public spending on pensions and unemployment in Belgium exceeded the European average by 1.3 and 1.1 percentage points respectively. The differences are much smaller for the other expenditure categories. For instance, public spending on health care in Belgium was hardly any higher than the EU-15 average in 2001. The same is true of public spending on incapacity and expenditure due to an active employment policy. The level of family allowances in Belgium was practically the same as in the EU-15. Finally, it should also be pointed out that Belgium does not have a structured system of housing allowances, since the social policy on housing is organised differently, whereas in the EU-15 housing allowances represented on average 0.4 p.c. of GDP in 2001.

There is a marked positive link between total social protection expenditure and per capita GDP. The EU countries can thus be divided into three groups. The new EU members have relatively low levels of prosperity and social protection. The Mediterranean countries (Italy, Greece, Portugal and Spain) form a second group comprising the lowest levels of per capita GDP and social protection expenditure in the EU-15. Finally, the social protection expenditure of the other Member States, which have a higher per capita GDP, varies between 25 and 31 p.c. of GDP. However, there are two notable exceptions to the link between the level of prosperity and public spending on social protection, namely Ireland and Luxembourg. In Luxembourg's case, that is probably due to the very high level of its GDP, whereas Ireland saw strong growth of its GDP in the 1990s and has a relatively young population.

CHART 7 SOCIAL PROTECTION[1] AND POVERTY RATE[2]
(2001)

POVERTY RATE BEFORE SOCIAL BENEFITS

INFLUENCE OF SOCIAL BENEFITS ON THE POVERTY RATE

■ Effect of pensions
■ Effect of social benefits other than pensions } (left-hand scale)
● Social protection expenditure (p.c. of GDP) (right-hand scale)

POVERTY RATE AFTER SOCIAL BENEFITS

● Social protection expenditure (p.c. of GDP) (right-hand scale)

Source: EC (2004a).
(1) Including the effect of mandatory private expenditure.
(2) Percentages of the population with an equivalent income below 60 p.c. of the median income.

1.4 Effect of social benefits on the poverty rate

One of the main functions of social protection is to reduce poverty. The effectiveness of social benefits can be measured by the difference in the poverty rate, defined as the proportion of households with income below 60 p.c. of the median income, before and after intervention.

In a hypothetical situation with no social transfers, poverty rates in the EU-15 and in Belgium would have totalled 39 and 38 p.c. respectively in 2001. Taking account of pensions, the poverty rate falls to 24 p.c. in the EU-15 and 23 p.c. in Belgium. Social benefits other than pensions reduce the poverty rate by 9 and 10 percentage points respectively. In all, social benefits reduce the poverty rates as defined above to 15 p.c. in the EU-15 and 13 p.c. in Belgium.

The average figures for the EU-15 conceal wide variations between countries. The impact of pensions on the poverty rate is generally greater than that of other social benefits. However, it is only 6 percentage points in Ireland, whereas the figure for Italy is 20 points. Denmark records the highest impact of social benefits other than pensions on the poverty rate (19 percentage points), while the lowest impact is recorded in Italy and Greece (3 percentage points).

The poverty rate ranges from 9 p.c. in Sweden to 21 p.c. in Ireland. If the poverty rate is compared with social protection expenditure as a percentage of GDP, a significant link becomes apparent between these two indicators: the higher the social protection expenditure in proportion to GDP, the lower a country's poverty rate.

2. Social security receipts

Social security receipts can be divided into a number of categories. First there are the social contributions – namely employers' and employees' contributions and the contributions of self-employed persons and non-active persons – which make up the bulk of social security receipts[1]. Next there are the transfers from other government sub-sectors, particularly the federal government[2]. These transfers consist partly of grants and partly of funding based on the sharing of the tax revenues collected by the Treasury, defined in the official jargon as

(1) The special contribution for social security is included in the social contributions here, whereas in the government accounts it is regarded as own tax revenue of the social security system.
(2) Since 2001, there has also been a transfer from the Flemish Community to the Vlaams Zorgfonds, which is part of the social security sub-sector in the government accounts.

TABLE 1   SOCIAL SECURITY RECEIPTS

(percentages of GDP)

	1970	1980	1990	2000	2004
1. Social contributions	9.4	11.7	13.8	13.8	13.7
Employers'	6.1	7.6	8.9	8.4	8.2
Employees'	2.6	3.0	3.9	4.3	4.4
Self-employed	0.7	0.9	0.8	0.9	0.8
Non-active	0.1	0.1	0.2	0.3	0.3
2. Transfers from other government sub-sectors	2.8	6.7	4.0	4.0	5.2
Grants	2.8	6.5	3.8	2.5	2.5
Alternative funding	0.0	0.1	0.2	1.5	2.8
3. Own direct and indirect taxes	0.0	0.1	0.2	0.4	0.5
4. Non-fiscal and non-parafiscal receipts	0.5	0.5	0.4	0.2	0.1
Total	12.8	18.9	18.3	18.4	19.6

Sources: NAI, NBB.

alternative funding. Finally, social security also has its own tax revenues as well as limited non-fiscal and non-parafiscal receipts.

2.1 Trend in receipts and changes in their composition

Social security receipts have expanded significantly in recent decades, rising from 12.8 p.c. of GDP in 1970 to 19.6 p.c. in 2004. Most of that growth took place in the 1970s and the early 1980s. In 1984, these receipts even peaked at 21.6 p.c. of GDP. During the ensuing period they subsided, dropping to 18.3 p.c. in 1990. Thus, as already mentioned, they followed a pattern very similar to that of expenditure.

At first, the strong expansion of social security was financed mainly by larger grants from the federal government. However, in view of the worsening budget deficits, the federal government made substantial cuts in these transfers during the 1980s. Social contributions gradually increased by just over two percentage points of GDP during each of these two decades as various measures were introduced. As a result, the social security funding structure – the relative share of the various categories of receipts – was more or less the same in 1990 as in 1970.

After 1990, receipts fluctuated around 18 to 19 p.c. of GDP. The funding structure also remained virtually unchanged. However, the federal government decided that it would progressively replace funding in the form of grants with alternative funding. In 2004 there was a substantial rise in the alternative funding of social security, totalling 1.1 p.c. of GDP, not only in order to guarantee the financial balance of social security, but also – at a rate of 0.4 percentage point – to cover the transfer to social security of the part of the daily cost of hospitalisation which had previously been paid by the federal government. Following this change, the share of social contributions in social security receipts declined to 70 p.c. in 2004.

2.2 Social contributions

As already stated, social contributions are the main source of funding for social security. They increased from 9.4 p.c. of GDP in 1970 to 11.7 p.c. in 1980, then to 13.8 p.c. in 1990. In 2004, they totalled 13.7 p.c. This growth was due partly to the rise in earned incomes – which form the main basis of the contributions – as a percentage of GDP, and partly to the rise in the implicit rate (i.e. the ratio between the social contributions levied and earned incomes). Since these data are only available from 1980 onwards, the detailed analysis of social contributions is confined to that period.

CHART 8   SOCIAL CONTRIBUTIONS

SOCIAL CONTRIBUTIONS
(percentages of GDP)

EARNED INCOMES[1]
(percentages of GDP)

IMPLICIT RATE
(percentages)
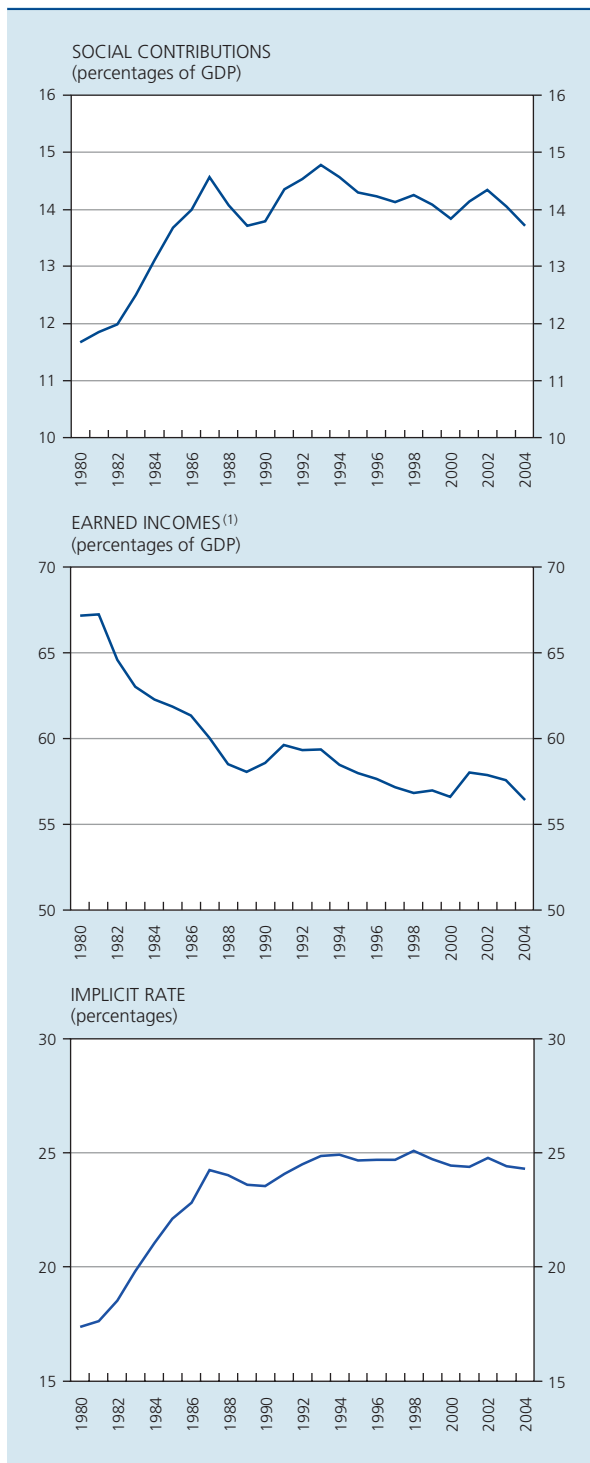
Sources : NAI, NBB.
(1) Earned incomes comprise the remuneration of employees and the gross mixed
    income of self-employed persons, excluding imputed social contributions.

Despite the steep fall in earned incomes as a percentage of GDP, down from 67.2 p.c. of GDP in 1980 to 58.6 p.c. in 1990, social contributions expressed as a percentage of GDP increased considerably during that period. This rise is therefore attributable solely to the marked increase in the implicit rate, which went up from 17.4 p.c. in 1980 to 24.3 p.c. in 1987, and remained more or less steady at 24 to 25 p.c. in the ensuing period. This considerable increase in the parafiscal burden on labour is due to various measures taken in the framework of the consolidation of public finances.

Thus, October 1982 saw the abolition of the remaining wage ceilings for contributions to certain branches of the scheme for employees[1]. Furthermore, the concept of remuneration was extended to include, in particular, the double holiday allowance. The main reason for the increase in employers' contributions was the introduction of wage moderation contributions corresponding to the cancelled indexations in 1984, 1985 and 1987. The rate of employees' contributions for private sector workers went up from 9.07 p.c. in 1980 to 12.07 p.c. in 1987. In addition, a contribution payable by single persons and households without children and a levy on family allowances were introduced. In 1992, these two contributions were abolished, but the rate of employees' contributions was raised to 13.07 p.c. For the self-employed, contribution rates were increased and the maximum levels of income to which these rates applied were raised ; a moderation contribution corresponding to the pay moderation of employees was also imposed on self-employed persons. Similarly, there was a sharp rise in contributions from non-active persons, owing to the introduction of various new contributions such as the solidarity levy on statutory pensions, disability allowances and early retirement pensions. Finally, in 1994 the special contribution for social security came into force.

Conversely, the reductions of employers' contributions curbed the growth of social contributions. These reductions were introduced in order to restrain labour costs, particularly for new employees taken on, and – in the beginning – especially for industrial firms exposed to foreign competition, as part of the so-called Maribel operation. In 1999, these reductions in employers' contributions, together with the reductions in charges for the low paid, were converted into a structural reduction which was subsequently extended. In 2004, the various reductions in employers' contributions were simplified

(1) Until 1994, social contributions under the scheme for employees were divided among the various branches of social security, in line with the percentages fixed by law. A "Social security financial balance fund" received special levies and contributions and transferred the proceeds to the branches for which the allocated contributions were insufficient. Since 1995, however, the bulk of the contributions and transfers from the federal government have been placed under the "overall management" system which finances the various social security branches according to their needs.

and harmonised. On that occasion, the majority of the existing specific rules were replaced by an overall reduction in employers' contributions, composed of two elements: first, the structural reduction mentioned above, which varies according to the worker's pay, and second, a number of reductions for target groups, in favour of older workers, the long-term unemployed, first jobs, young workers and the collective reduction in working time. In addition, a special reduction was granted for workers who were made redundant by restructuring and have found a new job through a job centre.

In the framework of the Employment Conference in 2003, it was decided to continue extending the reductions in contributions. In addition, the "work bonus" which incorporates the tax credit for the low paid in the reduction in employees' social security contributions on the lowest wages – introduced on 1 January 2000 – came into effect in 2005. The amount of the work bonus declines only gradually as earned income increases, so as to provide an incentive to work more or to seek a better paid job.

2.3 Other social security receipts

In 2004, other social security receipts represented just under one-third of total receipts. Around 27 p.c. of the total consists of transfers from other government subsectors. They primarily concern federal government funding in the form of grants and alternative funding. This last form of finance is considered partly as compensation for the loss of receipts in terms of social contributions, caused by the reductions granted to employers and workers.

In addition, social security has its own direct and indirect taxes, which represented 2.6 p.c. of its total receipts in 2004. These specific taxes include levies on various insurance products, a levy on the turnover of the pharmaceutical industry, specific payments by insurance companies to the Industrial Accidents Fund and the annual lump-sum contribution payable by companies in favour of the scheme for self-employed persons, introduced to take account of the fact that the activities of the self-employed are increasingly pursued in the form of a company.

Finally, social security also collects a small amount of non-fiscal and non-parafiscal receipts, such as interest paid on its financial assets.

(1) However, the self-employed receive a temporary allowance in the case of bankruptcy.
(2) Mandatory insurance against minor health risks for the self-employed is to be introduced in July 2006.

2.4 Comparison of the funding of the scheme for employees and the scheme for self-employed persons

The self-employed are not covered by social security to the same extent as employees. They therefore have to pay lower contributions. Thus, self-employed workers are not insured against unemployment, [1] nor against minor health risks, [2] and their pensions are lower.

CHART 9   FUNDING OF THE SCHEME FOR EMPLOYEES AND THE SCHEME FOR SELF-EMPLOYED PERSONS

(2003)
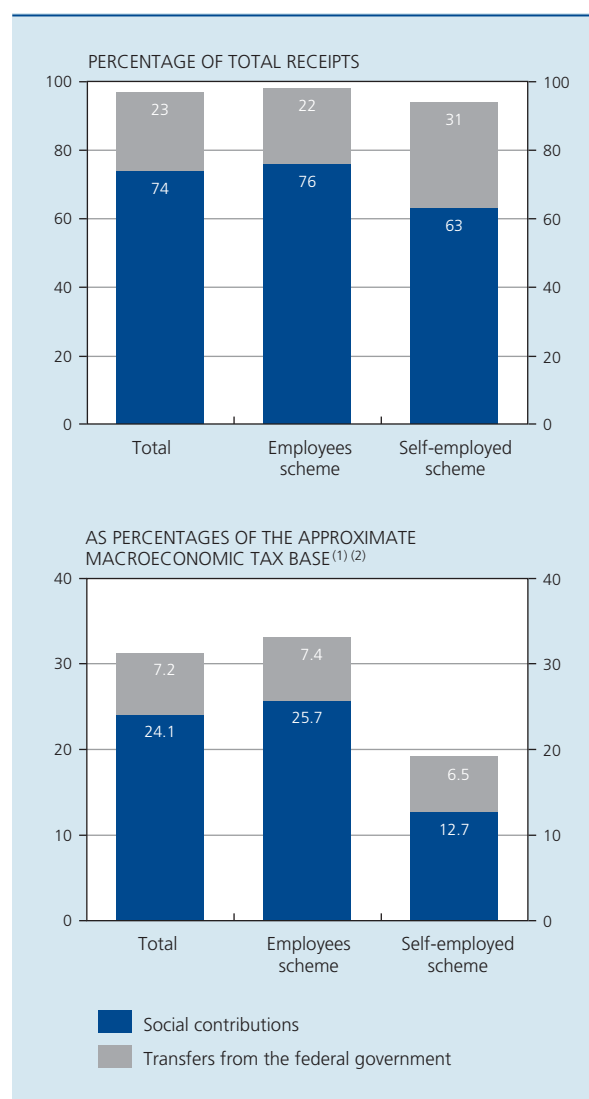
Sources: NAI, NBB.
(1) For employees, this is the wage bill less imputed contributions. For the self-employed, it is net mixed income.
(2) These results should be interpreted with caution since the macroeconomic variables used do not entirely correspond to the tax base of the contributions. The rate of contributions payable by employees in the private sector is currently 13.07 p.c., whereas the rate of employers' contributions in this sector is at least 33.03 p.c. In 2005, the rate of social contributions from the self-employed came to 19.65 p.c. on a maximum income of 45,604 euros (with a minimum of 459 euros per quarter), 14.16 p.c. on the second slice of income up to 67,301 euros and 0 p.c. on any excess.

There are major differences in the structure of receipts in both schemes. The self-employed persons' scheme obtains relatively less receipts from social contributions and more from federal government transfers. In 2003, social contributions represented 63 p.c. of receipts in the scheme for self-employed persons – excluding the annual lump-sum contribution from companies – against 76 p.c. in the employees' scheme. Federal government transfers accounted for 31 p.c. in the scheme for self-employed persons, against 22 p.c. in the employees' scheme.

In the self-employed persons' scheme, the implicit contribution rate, i.e. the ratio between the contributions and the most appropriate possible macroeconomic measurement of the tax base, represents only half of that in the employees' scheme. In relation to this macroeconomic measurement of income, federal government transfers are slightly smaller in the self-employed persons' scheme than in the employees' scheme.

3. Social security expenditure

Having explained the main sources of finance for social security, it is important to examine the uses to which these funds are assigned. This section first presents an overall profile of social security expenditure in the past and the structural changes which have taken place, together with a very brief account of the prospects for the future. It then focuses on the main categories of expenditure individually, describing their development and that of their determinants.

Social security benefits represent around 95 p.c. of the sub-sector's total expenditure. The other expenditure of social security, such as compensation of social security employees, current purchases of goods and services or business subsidies,[1] which represent only just over 1 p.c. of GDP, will be disregarded in the rest of this chapter. Therefore, the term "expenditure" in this article will refer only, somewhat imprecisely, to social benefits.

3.1 Trend in expenditure and changes in its composition

Social security expenditure grew from 11.3 to 18.6 p.c. of GDP between 1970 and 2004, an increase of 7.3 percentage points of GDP. This period can be divided into five phases, defined by the years of peaks and troughs in total expenditure expressed as percentages of GDP.

(1) This mainly concerns the social Maribel for the non-profit sector. From the point of view of the national accounts, this is regarded as a business subsidy, even though it is applied by way of a reduction in social contributions.

CHART 10 SOCIAL BENEFITS PROVIDED BY SOCIAL SECURITY

(percentages of GDP)
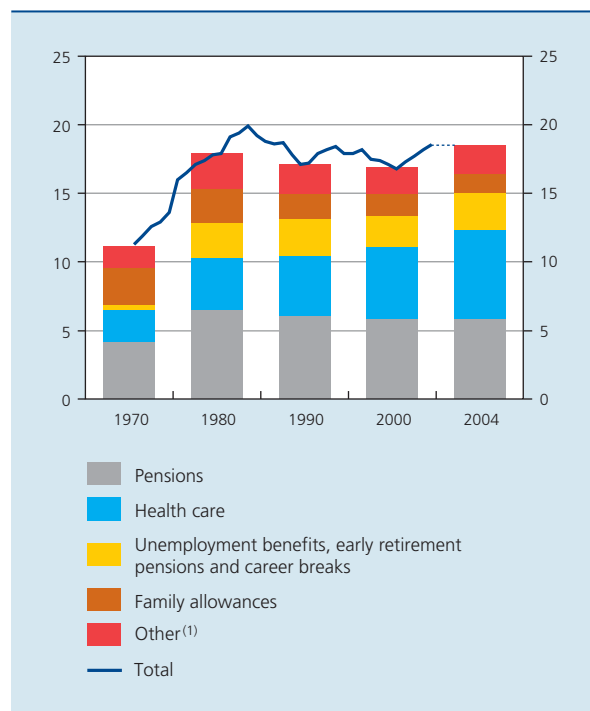
Sources : NAI, NBB.
(1) Mainly sickness/disability allowances and social benefits from the subsistence allowance funds, including the Compensation Fund for workers made redundant by business closures.

In the 1970s and up to 1983, expenditure rose steeply, increasing from 11.3 to 19.9 p.c. of GDP, an all-time high. This strong growth is mainly attributable to unemployment benefits which expanded at a very rapid rate, averaging almost 18 p.c. per annum over this period as a whole in real terms. Although the growth of the other expenditure items was more moderate, the rate of expansion was still higher – at 5.5 p.c. – than it ever has been since. This other expenditure therefore also contributed to the scale of the increase, primarily as a result of pensions being adjusted in line with prosperity and the increase in health care spending.

The decline in social security expenditure, totalling 2.8 points of GDP between 1983 and 1989, is due to the reduction, in real terms, in unemployment benefits, family allowances and sickness and disability benefits, and to the limited increase in expenditure on pensions. The period 1989-1993 saw an increase in social benefits amounting to 1.2 percentage points of GDP. Apart from the rapid rise in expenditure on health care and pensions, this increase was also due to higher expenditure on unemployment benefits. As a result of the budgetary consolidation,

TABLE 2   SOCIAL BENEFITS PROVIDED BY SOCIAL SECURITY

(averages of the percentage annual change at constant prices, [1] unless otherwise stated)

	1970-1983	1983-1989	1989-1993	1993-2000	2000-2004
Unemployment benefits	17.8	−2.5	5.6	−1.2	5.9
Other social benefits	5.5	1.2	3.2	1.5	3.7
of which :					
Pensions	6.0	1.2	3.0	1.2	1.5
Health care[2]	6.1	3.7	5.8	3.1	5.0
Other	4.6	−0.6	1.0	0.3	2.4
p.m. GDP at constant prices	*2.3*	*2.7*	*1.4*	*2.8*	*1.4*
p.m. Social benefits as p.c. of GDP[3]	*8.6*	*−2.8*	*1.2*	*−1.5*	*1.7*

Sources : NAI, NBB.
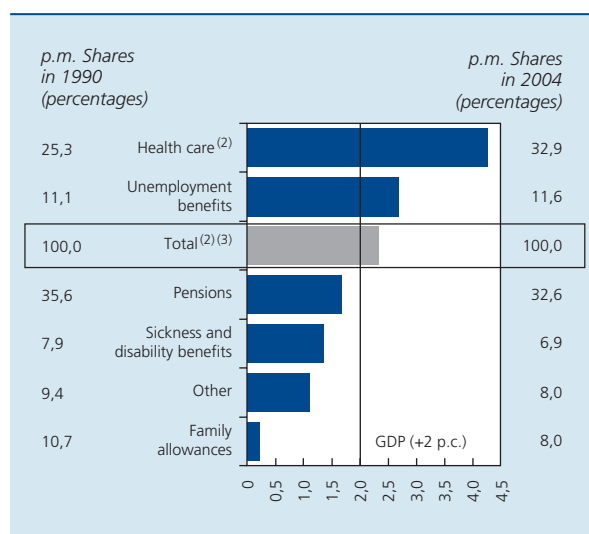(1) Expenditure deflated by the national consumer price index.
(2) Adjusted for the effect on expenditure of the transfer to social security, in 2004, of the part of the daily cost of hospitalisation which had previously been paid by the federal government.
(3) Total change between beginning and end of period.

due partly to the pursuit of the objectives required for joining the Economic and Monetary Union, the level of social benefits in 2000 was 1.5 percentage points of GDP below that of 1993. Over the period 1993-2000, all categories of social security expenditure contributed to the decline, except for health care. Finally, between 2000 and 2004 the return to strong growth of social security expenditure, which increased by 1.7 percentage points of GDP,[1] was due mainly to a rapid increase in health care expenditure and rising unemployment.

These developments are therefore attributable to cyclical factors, which mainly affect the movement in unemployment benefits, and structural factors, which influence the amount of pensions paid, for example, as well as to decisions relating to the government's fiscal policy, which may be more or less expansionary or restrictive. However, during the five phases identified above, growth appears to speed up and slow down simultaneously for all the main expenditure categories. Viewed overall, social security expenditure appears to be counter-cyclical, as the strong growth of expenditure occurs at the time of a slowdown in GDP growth, and vice versa.

Taking the period 1970-2004 as a whole, the growth of social benefits is due mainly to the rapid rise in health care expenditure, which amounted to 6.4 p.c. of GDP in 2004 against only 2.4 p.c. in 1970. Expenditure relating

CHART 11   SOCIAL SECURITY EXPENDITURE CATEGORIES

(average annual percentage change from 1990 to 2004, at constant prices, [1] unless otherwise stated)

Sources : NAI, NBB.
(1) Expenditure deflated by the national consumer price index.
(2) Adjusted for the effect on expenditure of the transfer to social security, in 2004, of the part of the hospital charge per day which had previously been paid by the federal government. As a result of the transfer of this expenditure to social security, the share of health care in total social benefits provided by social security increased from 32.9 to 34.6 p.c.
(3) Benefits paid by the Vlaams Zorgfonds, which represented 0.4 p.c. of total social benefits in 2004, are not included.

(1) This growth takes account of the effect on expenditure of the transfer to social security, in 2004, of the part of the daily cost of hospitalisation previously paid by the federal government. After adjustment for this item, the increase in social benefits between 2000 and 2004 came to just 1.3 percentage points.

to the labour market – unemployment, early retirement pensions and career breaks – also contributed to this growth, namely at a rate of 2.3 percentage points of GDP, and so did pensions which increased from 4.1 to 5.9 p.c. of GDP over the period considered. In contrast, family allowances contracted, falling from 2.7 to 1.4 p.c. of GDP. Other social benefits taken as a whole increased by 0.5 percentage point of GDP.

If the analysis is confined to a more recent period, namely 1990-2004, social security expenditure has grown at an annual average of 2.3 p.c. in real terms, outpacing the growth of GDP. Health care is still the fastest growing expenditure item, up by an annual average of 4.3 p.c. Unemployment benefits have also increased faster than GDP and total social expenditure. Expenditure on pensions and sickness and disability benefits has increased, but more slowly than GDP and total social expenditure. Finally, in 2004 family allowances were hardly any higher

than their 1990 level in real terms. As regards the "other" categories, this chapter will return later to the particularly marked changes in expenditure on career breaks and reductions in working time, and to the relative decline in early retirement pensions. It should also be noted that benefits in respect of occupational diseases have declined, following changes in the structure of the economy and the nature of work.

The share of health care in total social expenditure thus increased from a quarter in 1990 to a third in 2004. For the first time, this item thus represented a higher share than pensions which, although declining in relative terms, still represent almost one-third of social benefits. All other social benefits together also account for around one-third of social security expenditure, the main components being unemployment benefits, family allowances and sickness and disability benefits.

Box – Projection of social expenditure up to 2030

The Study Group on Ageing, set up under the High Council of Finance, is responsible for estimating the long-term consequences of population ageing in Belgium. In its latest annual report, dated May 2005, the Study Group assumes a GDP growth rate at constant prices averaging 1.9 p.c. per annum (2004-2030), on the basis of average annual increases in labour productivity and employment of 1.7 and 0.2 p.c. respectively. However, this expansion of employment, which should raise the employment rate by around 6 percentage points by 2030, requires continuation of an active policy, notably to reduce the level of structural unemployment.

Making these and other assumptions, such as an adjustment of social benefits to rising prosperity averaging 0.5 p.c. per annum, and a health expenditure growth rate of 4.5 p.c. per annum in real terms up to 2007 [1] later dropping to an average of 2.8 p.c. between 2008 and 2030, the Study Group on Ageing estimates the cost of ageing – defined as the net rise in social expenditure – at 3.6 percentage points of GDP between 2004 and 2030. The cost of pensions is expected to increase by 3.1 percentage points of GDP over this period. Within this category, the pensions of employees are projected to increase by 2.4 percentage points of GDP, while those of public officials will rise by just 0.7 percentage point of GDP. The share of self-employed persons' pensions is expected to remain unchanged. The expansion of health care, the second largest increase, is estimated to total 2.3 percentage points of GDP. Conversely, other social benefits will probably attenuate the cost of ageing to some extent: unemployment benefits and early retirement pensions should decline by 1.2 percentage points overall and family allowances should fall by 0.4 percentage point of GDP between now and 2030.

(1) Excluding the impact of the mandatory insurance, planned for July 2006, against minor health risks for the self-employed. ▶

REFERENCE SCENARIO FOR THE TREND IN SOCIAL EXPENDITURE[1]
BETWEEN NOW AND 2030

(percentages of GDP)
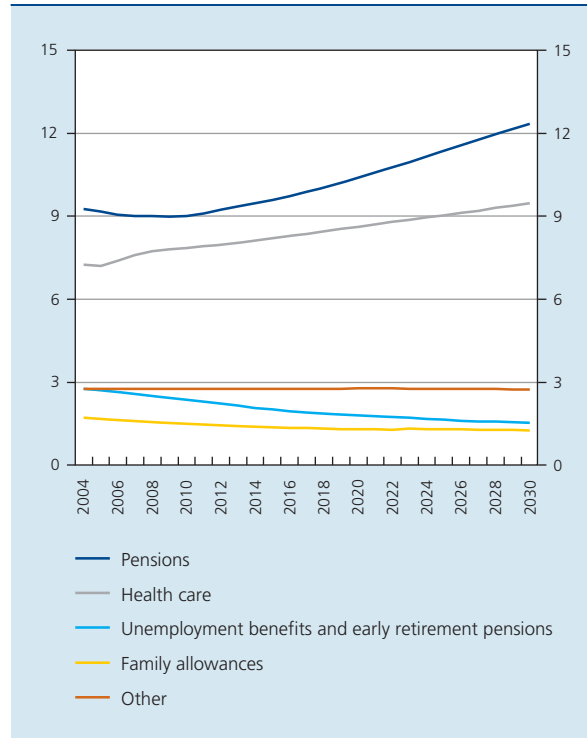
Source : Study Group on Ageing.

(1) The Study Group on Ageing deals with the social expenditure of general government, so that the levels of the various expenditure categories and their total differ from the figures used in the rest of this article, which focuses on the social security sector.

3.2 Expenditure categories : developments and determinants

Apart from the general developments described, each expenditure category is influenced by a number of specific factors. These factors consist of the number of recipients of a type of benefit and the average amount of the benefit received by each one. This last determinant is calculated implicitly for each of the categories except for health care spending for which this analysis is less appropriate.

3.2.1 Health care

As indicated before, health care is currently the largest social security expenditure item. Moreover, its relative size is steadily increasing, since the average rate of growth – 3.7 p.c. between 1980 and 2004 – is the highest of all expenditure categories.

However, the real growth of health care expenditure is highly volatile. It has been negative in some years, but particularly large in others. The use of a centred moving average makes it possible to smooth out these annual fluctuations to some extent, particularly by eliminating shifts from one year to the next – due partly to accounting delays – and short-term measures.

In the first half of the 1980s, health care expenditure grew at a moderate pace. Subsequently, and up to the beginning of the 1990s, growth was particularly rapid. However, this period was followed by a phase of below-average growth. In the past few years, the growth of health care expenditure has been well above the trend rate. It was particularly pronounced in 2003 and 2004, at rates of 7.5 and 6.7 p.c. respectively in real terms. The setting of a 4.5 p.c. growth norm, as under the July 2003 coalition agreement, was therefore

- Real GDP growth per capita
- Health care expenditure
- Average 1981-2004
- 5-year centred moving average [3]
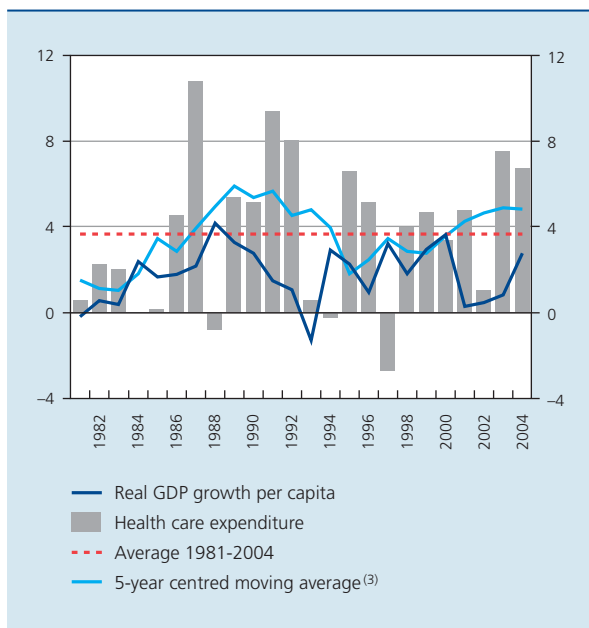
Sources : NAI, NBB.
(1) Public expenditure on health care, excluding sickness and invalidity benefits,
    expenditure on long-term care insurance, transfers to institutions caring for the
    handicapped, and disability benefits, but including the part of the hospital charge
    per day which was paid by the federal government until 2003.
(2) Expenditure deflated by the national consumer price index.
(3) Real growth was assumed to be 4.5 p.c. in 2005 and 2006 for the purpose of
    calculating the moving average for 2003 and 2004.

insufficient to contain expenditure within the planned budget.

Demographic factors account for 0.8 percentage point of the increase in health care expenditure, which averaged 3.7 p.c. from 1980 to 2004. The population expanded by an annual average of 0.3 p.c., while the effect of ageing, determined by the changing population structure and the average expenditure per age group, came to 0.5 percentage point. Overall, it is therefore estimated that non-demographic factors contributed 2.9 percentage points to the average annual increase in health care expenditure.

These last factors comprise multiple elements, such as medical and technological progress, the fact that prices tend to rise faster in the health care sector, which is relatively labour-intensive, changes in behaviour on the demand side – particularly because of the increased supply of health care and the higher standard of living – and the impact of various measures aimed at improving access to health care.

The Study Group on Ageing assumed that health care expenditure would grow by an annual average of 3 p.c. between 2004 and 2030 in real terms. During that period, population ageing would still be a key factor in the growth of expenditure : its impact on the annual expansion of health care was estimated at 0.7 percentage point, whereas population growth was expected to account for 0.2 percentage point.

The impact of non-demographic factors is, by its nature, difficult to predict, so that the projections on this subject are particularly difficult. Most of the projection methods used in relation to health care, including the one used by the Study Group on Ageing, establish a link between these non-demographic factors and the rise in per capita GDP. Thus, the expansion of health care expenditure should decelerate progressively on account of the expected slow-down in per capita GDP growth, owing to the decline in employment from 2015, taking account of the predicted long-term demographic trends.

3.2.2 Pensions

Pension expenditure grew in real terms by an annual average of 1.7 p.c. between 1990 and 2004. This growth was particularly strong in the early 1990s, peaking at 4.1 p.c. in 1991, and was again above average in 2002 and 2003. The two determinants of the total amount of pensions contributed to this growth : on average over this period, the number of pensioners increased by 0.8 p.c. per annum and the amount of the average pension, calculated implicitly, rose by 0.9 p.c. per annum at constant prices.
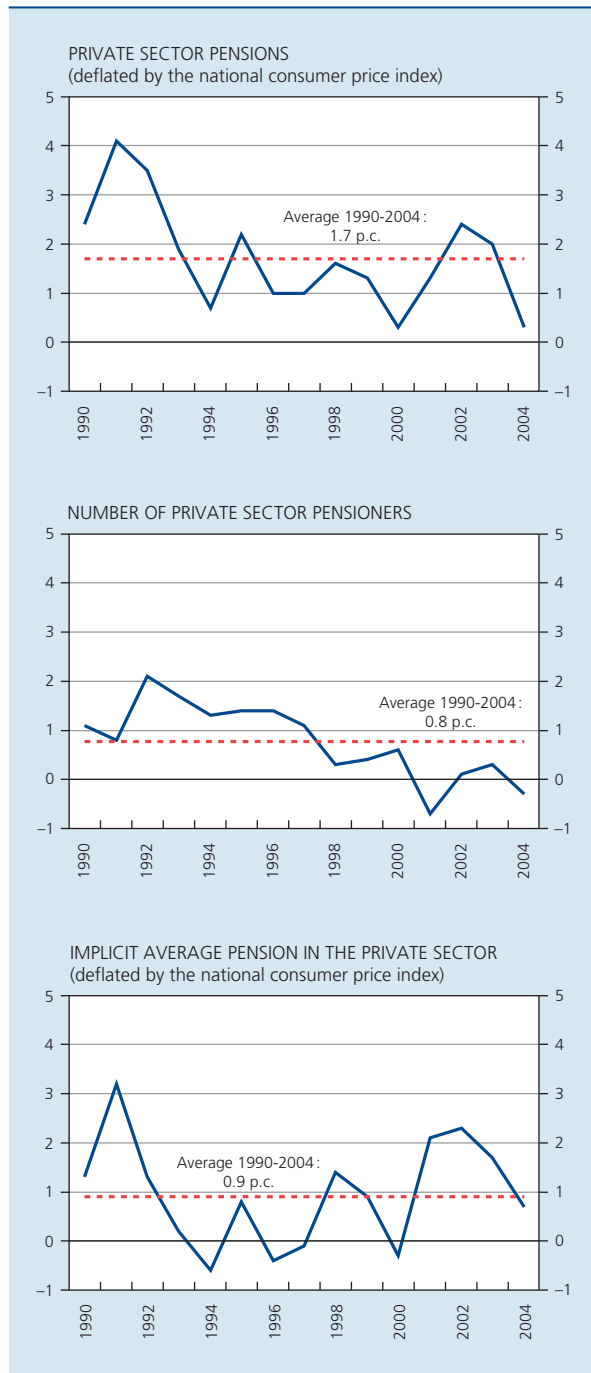
3.2.2.1 Number of beneficiaries

There are three main schemes for pensioners : employees and the self-employed come under the private sector pension system, while statutory public officials come under the public sector pension system. The latter are therefore outside the scope of social security expenditure since their pensions are paid directly by the other public authorities [1].

Altogether, the number of private sector pensioners increased from around 1.6 million in 1990 to roughly 1.7 million in 2004, a rise of 11 p.c. Growth was relatively sustained until 1997, then slowed down markedly and was actually negative in 2001 and 2004. This trend reversal was due at least partly to changes in the law, as the pension scheme for employees and the self-employed

(1) However, some of the officials employed by local authorities (provinces and municipalities) come under the social security pension system if the authority employing them has opted to contribute to the NSSOPLA.

CHART 13 SOCIAL SECURITY PENSION EXPENDITURE AND DETERMINANTS

(percentage change compared to the previous year)

PRIVATE SECTOR PENSIONS
(deflated by the national consumer price index)

Average 1990-2004 :
1.7 p.c.

NUMBER OF PRIVATE SECTOR PENSIONERS

Average 1990-2004 :
0.8 p.c.

IMPLICIT AVERAGE PENSION IN THE PRIVATE SECTOR
(deflated by the national consumer price index)

Average 1990-2004 :
0.9 p.c.
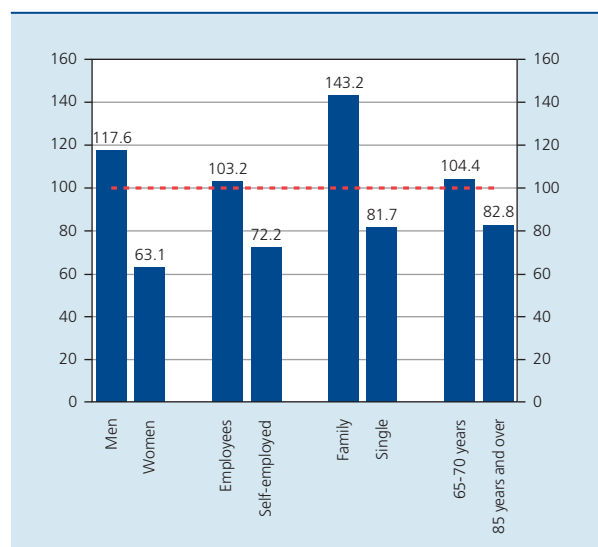
Sources : NAI, NPO, NBB.

order to qualify for early retirement from the age of 60 are being progressively tightened up for both men and women.

In its projections, the Study Group on Ageing estimates that the number of beneficiaries under the schemes for employees and the self-employed should increase by 59 and 30 p.c. respectively between now and 2030. While this increase is expected to be fairly limited until 2010, it will subsequently accelerate. This strong rise in the number of pensioners is the main factor determining the predicted increase in pension expenditure of the social security system.

3.2.2.2 Average real implicit amount of pensions

In all, the growth of average implicit pensions at constant prices came to 13.7 p.c. between 1990 and 2004. Although this growth tended to see-saw, it is nonetheless possible to identify certain trends. Thus, growth was fairly rapid at the beginning of the 1990s, boosted mainly by the increases granted to the oldest pensioners. Since 2001 it has again been fairly rapid, similarly as a result of measures in favour of the lowest and the oldest pensions. Between these two periods of rapid growth, the average amount of a pension remained more or less unchanged, mainly because no welfare adjustment was granted between 1991 and 1999.

CHART 14 AVERAGE AMOUNTS OF SOCIAL SECURITY PENSIONS[1]

(2004, sample average index = 100)

Sources : NPO, NBB.
(1) Sample restricted to persons over 65 years old, "pure" employees or self-employed excluding combination careers, without taking account of survivors' pensions or guaranteed income schemes.

was reformed by the Framework Law of 26 July 1996. This reform gradually increases both the statutory retirement age for women and the denominator of the fraction of working years used to calculate their pension, thus encouraging them to work longer. In addition, the employment history conditions which must be met in

There are still large differences between the average amounts of pensions received by the various categories of pensioners. On average, women receive a gross pension which is only half that of men, because their working life is generally shorter and their pay is lower on average. The pensions of the self-employed are 30 p.c. lower than those of employees, on average. Single persons receive only about 60 p.c. of the amount applicable for "family" pensions. Finally, "young" pensioners aged from 65 to 70 years receive pensions which are 25 p.c. higher than those of persons aged 85 years and over, the reason being the upward trend in wages, which form the basis for calculating the pensions, and the fact that existing pensions are only partially adjusted in line with prosperity.

These differences, combined with changes in the structure of the retired population, have had an impact on the movement in average pensions at constant prices, an impact which is likely to persist, at least to some extent. The increase in the female participation rate and the decline of the amount of "family" pensions, which is an indirect consequence of that, depress the amount of the average pension. The rise in the percentage of the oldest pensioners is another factor curbing the average pension amounts. The replacement of "older pensioners" with "young pensioners" exerts the opposite effect, as does the reduction in the proportion of the self-employed.

Finally, in recent years discretionary measures have mainly concerned adjustment of the oldest pensions in line with prosperity and increases of the lowest pensions. These measures, which – as announced by government announcement – are to continue in the years ahead, have generally had a positive impact on the average amount of pensions.

3.2.3 Expenditure relating to the labour market

Expenditure relating to the labour market falls into three categories: unemployment benefits, early retirement pensions and schemes for career breaks and reductions in working time. They are sometimes grouped together, as NEMO is the institution paying these benefits. However, treating them separately, as it is done here, makes it possible to analyse the trends and determinants in greater detail.

3.2.3.1 Unemployment benefits

Unemployment expenditure increased in real terms by an annual average of 2.5 p.c. between 1990 and 2004. This growth was fairly strong in the early 1990s and again between 2001 and 2003. Conversely, the total amount
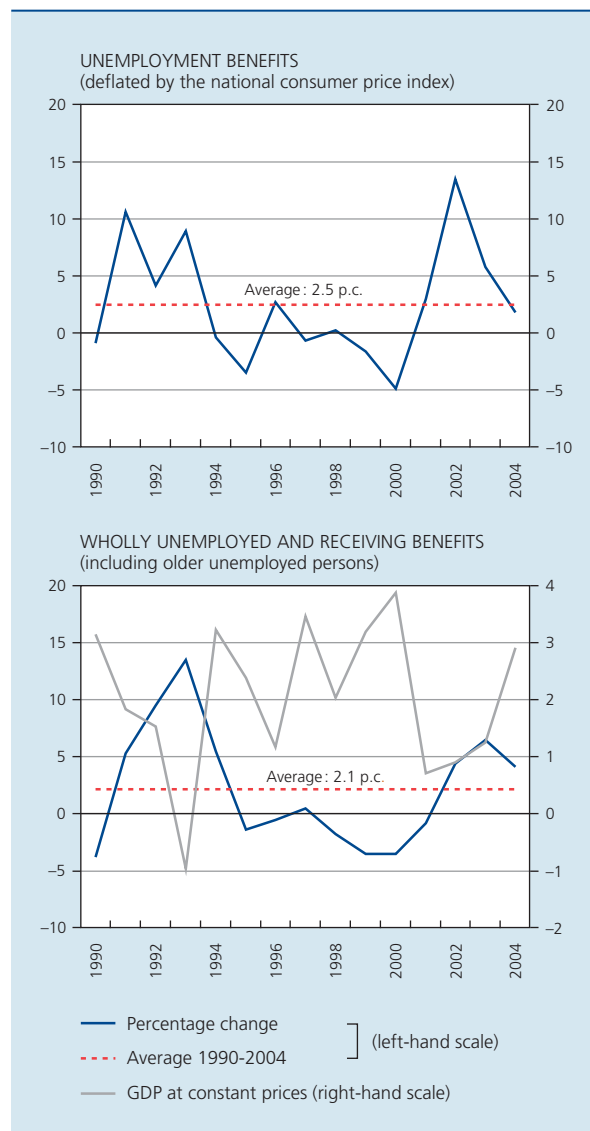
Sources: NAI, NEMO, NBB.

of unemployment benefits declined overall between 1994 and 2000.

Over the period as a whole, this increase was due almost exclusively to the rise in the number of unemployed[1], at an annual average of 2.1 p.c. Apart from an upward trend which will not be discussed here, the movement in the number of unemployed is greatly influenced by the business cycle. Thus, unemployment grew fairly rapidly between 1991 and 1994 and from 2002 onwards,

(1) This group was restricted here to persons wholly unemployed and receiving benefits, including the older unemployed, since they receive the great majority of the unemployment benefits.

owing to the marked slowdown in activity during those periods. Conversely, from 1995 to 2001, the number of unemployed fell almost every year.

The average amount of the benefits, calculated implicitly, grew by only 0.3 p.c. per annum in real terms over the 1990-2004 period as a whole.

3.2.3.2 Early retirement pensions

In contrast to unemployment benefits, expenditure on early retirement pensions has declined since 1990, by an annual average of 1.4 p.c. in real terms. The only periods in which these benefits increased were the years 1990-1992 and 2003-2004. The medium-term evolution is due mainly to the reduction in the number of early retired, down by 1.5 p.c. per annum over the period as a whole,

while there has been practically no change, on average, in the implicit benefits since 1990.

The link between the economic cycle and the number of early retired is less marked than in the case of unemployment. That difference is probably due to the method of departure from each system : exits from the unemployment scheme are at least partly linked to the business cycle, whereas exits from the early retirement pension scheme are determined by the age attained by persons who have taken early retirement, and their switch to pensioner status. It is therefore only the movement in the number of new persons taking early retirement that is subject to cyclical variations. This factor also probably explains the unusual rise in the number of early retired in 2003 and 2004. The generally buoyant economy of the second half of the 1990s had in fact produced relatively fewer persons taking early retirement than before. As a result, at the time when these relatively small cohorts reached the statutory retirement age, exits from early retirement status were fewer in number. Combined with a slowdown in activity in recent years, this factor is probably contributing to restoring positive growth in the numbers taking early retirement.
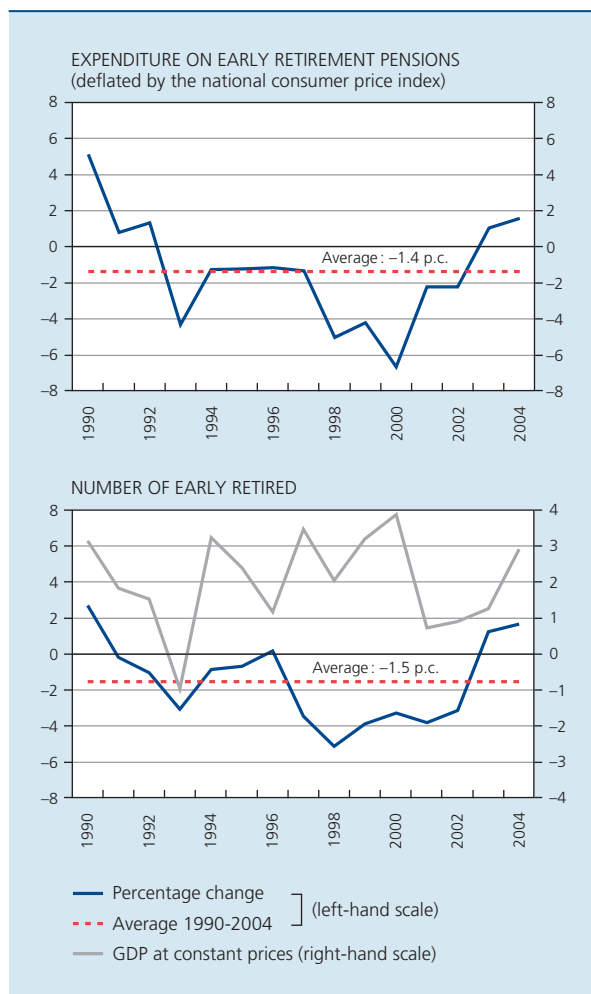
Another point worth mentioning is that growth of around 1.5 p.c. in the number of early retired, as in 2003 and 2004, corresponds to an average increase of just over 1,500 persons, so that factors of a more microeconomic nature may also play a part in this trend.

3.2.3.3 Career breaks and reductions in working time

Although this was the category of social security expenditure which saw the strongest growth, the weight of career breaks and reductions in working time is still very small, at less than 0.2 p.c. of GDP. The real annual average growth of 10.3 p.c. since 1990 is due almost entirely to the increase in the number of persons participating in these schemes, averaging 10.1 p.c. per annum, so that the number practically quadrupled over the period as a whole.

The rise in the number of people receiving benefits for career breaks and reductions in working time is due to the wide range of formulas offered to workers. Thus, on the one hand there has been the gradual development of time credit schemes (full or part time), 4/5 working time, reductions in working time for workers aged 50 years and over, and on the other hand special schemes such as parental leave, carer's leave and medical treatment leave.
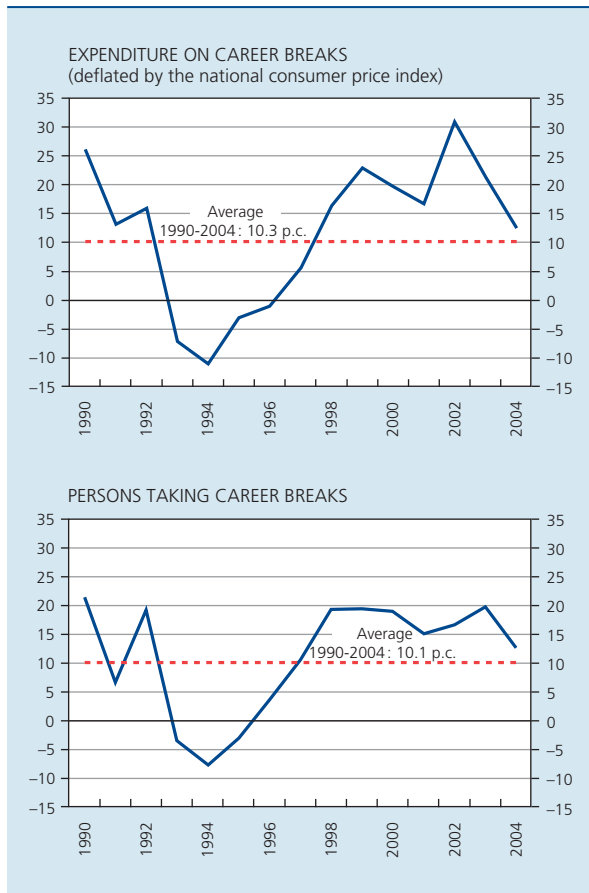
CHART 16   EXPENDITURE ON EARLY RETIREMENT PENSIONS AND NUMBERS TAKING EARLY RETIREMENT

(percentage change compared to the previous year)

EXPENDITURE ON EARLY RETIREMENT PENSIONS
(deflated by the national consumer price index)

Average : −1.4 p.c.

NUMBER OF EARLY RETIRED

Average : −1.5 p.c.

— Percentage change
--- Average 1990-2004 ⎤ (left-hand scale)
— GDP at constant prices (right-hand scale)

Sources : NAI, NEMO, NBB.

EXPENDITURE ON CAREER BREAKS
(deflated by the national consumer price index)

Average
1990-2004 : 10.3 p.c.

PERSONS TAKING CAREER BREAKS

Average
1990-2004 : 10.1 p.c.

Sources : NAI, NEMO, NBB.

The rise in the number of beneficiaries recorded since 1990, which exceeded population growth, is due to various factors. Thus, some beneficiaries who had previously come under specific systems (employees of Belgacom, the Post Office and the RTBF) were gradually incorporated in the private sector system of family allowances. In addition, the trend towards staying in education for longer means that the allowances are paid out over a longer period. The recent acceleration in growth, which has averaged 0.6 p.c. since 2002, is due partly to the weakness of the economy, as young job seekers retain their entitlement to family allowances during the waiting period (for unemployment benefits) immediately following completion of their education.

The decline in the average amount of the family allowances appears to be due mainly to the reduction in the number of children per family, as the amount of the allowances depends on the child's rank and increases for each additional child.

EXPENDITURE ON FAMILY ALLOWANCES
(deflated by the national consumer price index)

Average
1990-2004 : 0.0 p.c.

NUMBER OF CHILDREN FOR WHICH FAMILY
ALLOWANCES ARE RECEIVED

Average
1990-2004 : 0.4 p.c.

Sources : NAI, NOFA, NBB.

Although these measures were introduced at a specific moment, their success is dependent on a change of attitude. It is therefore likely that their influence will make itself felt gradually, so that sustained growth will probably last.
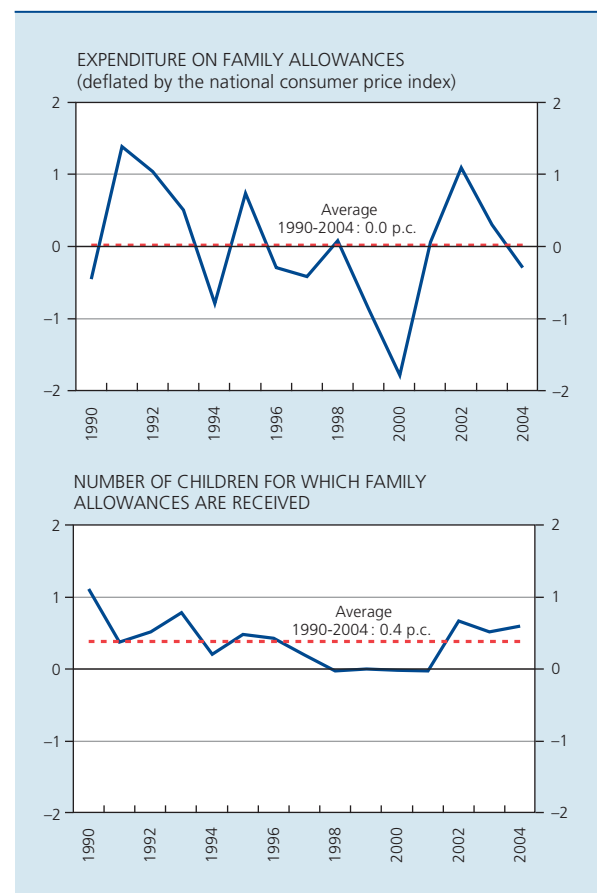
3.2.4 Family allowances

In 2004, expenditure on family allowances was practically the same, at constant prices, as it was in 1990. This relative stabilisation is due to a small rise in the number of beneficiaries, averaging 0.4 p.c. per annum, while the average amount paid per qualifying child declined in the same proportion at constant prices. In 2004, these benefits represented 1.7 p.c. of GDP, compared to 2.1 p.c. in 1990.

4. Conclusions

On the basis of the above analysis, a number of conclusions can be drawn.

First, it has been shown that the level of social benefits paid by the government in Belgium, essentially via the social security sector, is higher than the European average. This difference is due mainly to relatively higher expenditure on pensions and unemployment.

In addition, the analysis illustrated the fact that social security expanded particularly strongly in the 1970s. In the ensuing period, total receipts and expenditure remained relatively stable on average; expressed as percentages of GDP, they stood in 2000 at roughly the same level as in 1980. During this period, however, there was a "stop and go" policy on expenditure and receipts, in that the expansion periods were followed by periods in which a restrictive policy was pursued. In recent years, social security has again been expanding, although only to a limited extent. The analysis also showed that the structure of social security expenditure has undergone profound changes, resulting partly from a strong rise in health care expenditure.

Since receipts and expenditure have hitherto moved very much in parallel, the financial balance of social security has always hovered around equilibrium. At present, the social security sector is not only free of any financial liabilities, it actually has substantial financial assets.

Finally, population ageing will clearly exert strong upward pressure on future expenditure on pensions and health care. This increase can be only partly offset by the predicted decline in unemployment expenditure and family allowances. Therefore, social security will have to face a major financial challenge in the (near) future.

Bibliography

European Commission (2002), *Social protection in Europe 2001* (www.europe.eu.int).

European Commission (2004a), *Joint report on social inclusion 2004* (www.europe.eu.int).

European Commission (2004b), *European system of integrated social protection Statistics (ESSPROS)* (epp. eurostat. cec. eu. int).

Federal Public Service Social security (various publications), *Vade Mecum : budget de la protection social*.

Festjens, M.J. (1993), "De ontwikkeling van de Sociale Zekerheid tijdens de periode 1980-1990", in *Histoire de finances public en Belgique, le periode 1980-1990*, Belgian Institute of Public Finances, Ghent, Belgium, Academia Press 223-0358.

OECD (2004), *Social Expenditure Database (SOCX)*, 1980-2001 (www.oecd.org).

Study Group on Ageing (various publications), *Annual Report*, High Council of Finance.

Van Eeckhoutte, W. (various publications), *Mémento social*, Brussels, Belgium, Kluwer.

Summaries of articles

Industry in Belgium : past developments and challenges for the future

The article constitutes the synthesis of a broad study on industry in Belgium, conducted by the NBB, at the request of social partners. Some contributions were also made by the Federal Planning Bureau. In the past decades, industry has been submitted to two global trends. Firstly, deindustrialisation took the form of nominal activity and employment transfers between branches, i.e. from industry to services, while at the same time real industrial value added kept growing at a similar rate as the total economy, due to large productivity gains. Secondly, and partly linked to what precedes, economic globalisation was generalised thanks to liberalisation and technological progress, which has thoroughly modified the environment in which companies operate by opening up new markets and allowing an increased division of the production process in search of efficiency. Recently, these long-known trends seem to have further accelerated due to the emergence of rapidly growing economies, which are either closely linked to European countries (ten new member states) or are large-scale economies (China).

More than ever, the industry's future lies in safeguarding competitiveness and looking for new competitive edges, a challenge which it shares with the total economy. First of all, it requires a close monitoring of cost developments, especially as competition mainly takes place with neighbouring, thus similar, economies. In this respect, wages are an important, but only one component of production costs. Nevertheless, the competitiveness of an economy increasingly results from a large group of non-cost elements, which together determine its innovation capacity. Among these, we mainly stress the importance of continuous private and public investments, which are necessary to preserve and enhance the capital stock, of a well-educated and continuously trained labour force, of sufficient and well-oriented R&D efforts and of adequate and diversified sources of financing.

Broadly speaking, innovation and economic dynamism require an integrated and extended approach, bringing together enterprises, research centres, universities and public authorities, in order for them to agree on a common view and maximise the spillover effects. Industry will still have an important role to play in meeting this objective.

JEL Code : L6

Key words : industry, deindustrialisation, globalisation, competitiveness, innovation.

The potential growth of the Belgian economy and its determinants

The potential growth path of the economy is at the centre of various fundamental economic questions, particularly in connection with the conduct of monetary policy and the management of public finances. It also determines the progress of living standards, so that the adverse population prospects confronting the European economies have rekindled interest in the subject.

The first chapter of the article reports on the developments recorded over the past twenty years, using a method derived from the one adopted by the EC and based on the use of a production function. The role played by the three determinants – labour, capital and total factor productivity – is discussed, focusing on the case of the Belgian economy while comparing the results with those recorded in the EU-15. With potential growth averaging 2.2 p.c. for the private sector and 2.1 p.c. in the whole economy, Belgium is in the middle group of European countries.

A growth breakdown between labour volume and labour productivity is proposed in chapter 2. Belgium's advantages and disadvantages are assessed, not only in comparison with the EU-15 average but also in relation to the United States. Particular attention is drawn to the divergent picture in terms of productivity on the two continents. The improving performance in the United States in this respect contrasts with the deceleration recorded in Europe. The slowdown was also experienced in Belgium although, in the past ten years, the weaker growth in labour productivity here was due essentially to a slower increase in capital intensity. Having diminished between 1985 and 1995, the growth of total factor productivity, which in principle measures the overall productive capacity of the economy, stabilised at a level above the European average and close to that of the United States. This relatively good performance could be due to the fairly widespread use of ICT, as Belgium's investment expenditure on this item is greater than that of the majority of European countries. The highly skilled labour force provides additional support for total factor productivity, although its impact has not been quantified in the case of Belgium. Expenditure on research and development could also yield substantial productivity returns. Particular efforts in these three fields, in a context within which market forces provide appropriate incentives to the economic agents, could hold possibilities for enhancing productivity growth. This could contribute to stimulate growth in view of the anticipated adverse demographic developments in the coming decades, that will also require raising the rates of participation in the labour market.

JEL Code : E23, J 24, O30, O47

Key words : potential output, labour productivity, growth accounting, total factor productivity.

Stock and house prices and monetary policy

Recent developments in stock and house prices revived the debate on the role of asset prices in the conduct of monetary policy. The article first explores the links between asset price fluctuations, macroeconomic developments and monetary policy, highlighting the possibility of asset price booms and bursts in an environment of stable consumer prices and the challenges for monetary policy. The problem of identification of "bubbles" is then illustrated by an assessment of recent developments in stock prices in the United States and the euro area and in house prices in the euro area, with special attention for the fast-increasing house prices in some countries and for the Belgian situation. Finally, the article briefly explains how asset prices are taken into account in the monetary policy strategy of the Eurosystem.

JEL Code : E58

Key words : monetary policy, transmission process, stock prices, residential property prices, Eurosystem.

Pricing behaviour in the euro area : results of a Eurosystem survey

The article presents the results of surveys on several qualitative aspects of pricing behaviour, conducted within the framework of the Eurosystem Inflation Persistence Network (IPN). The surveys cover more than 11,000 firms in nine euro area countries. Despite some methodological differences between the surveys of individual countries, the results are quite similar in many respects. They reveal a relatively high degree of price rigidity, as the median firm changes prices once a year. The pricing behaviour may be both time-dependent and state-dependent. These findings are in line with IPN conclusions on the quantitative analysis of the pricing of goods and services. Furthermore, the surveys show that the environment in which the European firms operate deviates significantly from a perfect competition situation and that, in line with the basic premises of the new-Keynesian literature, firms do have market power and apply various forms of price discrimination. In addition, the surveys provide evidence that cost changes are more important for price increases than for price cuts, whereas changes in market conditions have a greater impact in the case of price cuts. The factors explaining price rigidity relate to the existence of implicit or explicit contracts, whereas menu costs or information-gathering costs are not regarded as major obstacles to price adjustments. The flatness of the marginal costs curve and the fact that firms are reluctant to be the first to change prices, are also seen as important impediments to price adjustments.

JEL Code : D40, E31, L11.

Key words : pricing behaviour, price rigidity, survey, time-dependent pricing, state-dependent pricing, price discrimination, Eurosystem.

Social security finances

One of the government's main functions is to protect the population against a number of social risks. Hence, replacement incomes are provided in the event of unemployment, old age or occupational disability. Income supplements are granted to compensate in part for the financial burden associated with illness or with bringing up children. These social benefits are an important facet of the redistribution of income effected by the government.

In Belgium, social protection is provided mainly by the social security sub-sector, which is the largest component of the general government sector. The level of government expenditure on social protection in Belgium is, expressed as a percentage of GDP, above the European Union average. This is due mainly to relatively higher expenditure on pensions and unemployment.

The Belgian social security sector expanded strongly in the 1970s. In the ensuing period, total social security receipts and expenditure remained relatively stable on average; expressed as percentages of GDP, they stood in 2000 at roughly the same level as in 1980. During this period, however, there was a "stop and go" policy on expenditure and receipts: expansion periods were followed by periods in which a more restrictive policy was pursued. In recent years, social security has again been expanding, although only to a more limited extent. Over the years, the structure of social security spending has changed significantly: due to the strong rise in health care expenditure, this spending item has now become the most important component, just ahead of pensions. Since receipts and expenditure have hitherto moved very much in parallel, the financial balance of social security has always hovered around equilibrium. At present, the social security sector is not only free of any financial liabilities, it actually has substantial financial assets.

Population ageing will clearly exert strong upward pressure on future expenditure on pensions and health care. This increase can be only partly offset by the predicted decline in unemployment expenditure and family allowances. Therefore, social security will have to face a major financial challenge in the (near) future.

JEL Code: H11, H24, H51, H53, H55, H69

Key words: Belgian public finance, social security, social protection expenditure.

Abstracts of the working papers series

70. Measuring inflation persistence : a structural time series approach, by M. Dossche and G. Everaert, June 2005

Time series estimates of inflation persistence incur an upward bias if shifts in the inflation target of the central bank remain unaccounted for. Using a structural time series approach the authors measure different sorts of inflation persistence allowing for an unobserved time-varying inflation target. Unobserved components are identified using Kalman filtering and smoothing techniques. Posterior densities of the model parameters and the unobserved components are obtained in a Bayesian framework based on importance sampling. The authors find that inflation persistence, expressed by the half-life of a shock, can range from one quarter in case of a cost-push shock to several years for a shock to long-run inflation expectations or the output gap.

71. Financial intermediation theory and implications for the sources of value in structured finance markets, by J. Mitchell, July 2005

Structured finance instruments represent a form of securitization technology which can be defined by the characteristics of pooling of financial assets, de-linking of the credit risk of the asset pool from the credit risk of the originating intermediary, and issuance of tranched liabilities backed by the asset pool. Tranching effectively accomplishes a "slicing" of the loss distribution of the underlying asset pool. The paper reviews the finance literature relating to security design and securitization, in order to identify the economic forces underlying the creation of structured finance instruments. A question addressed is under what circumstances one would expect to observe pooling alone (as with traditional securitization) versus pooling and tranching combined (as with structured finance).

It is argued that asymmetric information problems between an originator and investors can lead to pooling of assets and tranching of associated liabilities, as opposed to pooling alone. The more acute the problem of adverse selection, the more likely is value to be created through issuance of tranched asset-backed securities. Structured finance instruments also help to complete incomplete financial markets, and they may also appear in response to market segmentation.

72. Liquidity risk in securities settlement, by J. Devriese and J. Mitchell, July 2005

The paper studies the potential impact on securities settlement systems (SSSs) of a major market disruption, caused by the default of the largest player. A multi-period, multi-security model with intraday credit is used to simulate direct and second-round settlement failures triggered by the default, as well as the dynamics of settlement failures, arising from a lag in settlement relative to the date of trades. The effects of the defaulter's net trade position, the numbers of securities and participants in the market, and participants' trading behavior are also analyzed.

The authors show that in SSSs – contrary to payment systems – large and persistent settlement failures are possible even when ample liquidity is provided. Central bank liquidity support to SSSs thus cannot eliminate settlement failures due to major market disruptions. This is due to the fact that securities transactions involve a cash leg and a securities leg, and liquidity can affect only the cash side of a transaction. Whereas a broad program of securities borrowing and lending might help, it is precisely during periods of market disruption that participants will be least willing to lend securities.

Settlement failures can continue to occur beyond the period corresponding to the lag in settlement. This is due to the fact that, upon observation of a default, market participants must form expectations about the impact of the default, and these expectations affect current trading behavior. If, ex post, fewer of the previous trades settle than expected, new settlement failures will occur. This result has interesting implications for financial stability. On the one hand, conservative reactions by market participants to a default – for example by limiting the volume of trades – can result in a more rapid return of the settlement system to a normal level of efficiency. On the other hand, limitation of trading by market participants can reduce market liquidity, which may have a negative impact on financial stability.

73. An international analysis of earnings, stock prices and bond yields, by A. Durré and P. Giot, September 2005

The paper assesses the possible contemporaneous relationship between stock index prices, earnings and long-term government bond yields for a large number of countries and over a time period that spans several decades. In a cointegration framework, it looks at three hypotheses. First, is there a long-term contemporaneous relationship between earnings, stock prices and government bond yields? Second, does a deviation from this possible long-run equilibrium impact stock prices such that the equilibrium is restored? Third, do government bond yields play a significant role in the long-run relationship or does the latter only involve stock prices and earnings? The authors also study the short-term impact of changes in long-term government bond yields on stock prices and discuss their short-term and long-term results in light of the recent developments regarding the so-called Fed model.

Conventional signs

-	the datum does not exist or is meaningless
e	estimate by the Bank
n.	not available
p.c.	per cent
p.m.	pro memoria

List of abbreviations

COUNTRIES

AT	Austria
BE	Belgium
CH	Switzerland
CZ	Czech Republic
DE	Germany
DK	Denmark
EA	Euro area
EE	Estonia
ES	Spain
FI	Finland
FR	France
GB	United Kingdom
GR	Greece
HU	Hungary
IE	Ireland
IS	Iceland
IT	Italy
LT	Lithuania
LU	Luxembourg
LV	Latvia
MT	Malta
NL	Netherlands
NO	Norway
PL	Poland
PT	Portugal
SE	Sweden
SK	Slovakia
SL	Slovenia
US	United States

OTHERS

ASEAN	Association of Southeast Asian Nations
BLEU	Belgian-Luxembourg Economic Union
CVTS	Continuing Vocational Training Survey
DJ	Dow Jones
EC	European Commission
ECB	European Central Bank
EPO	European Patent Office
ESSPROS	European System of Integrated Social Protection Systems
EU	European Union
EU-15	European Union excluding the ten countries which joined on 1 May 2004
FATS	Foreign Affiliates Trade Statistics
FBC	Federation of Belgian Companies
FDI	Foreign Direct Investment
FPB	Federal Planning Bureau
GDP	Gross Domestic Product
GGDC	Groningen Growth & Development Centre
HP	Hodrick-Prescott (filter of)
ICT	Information and Communication Technologies
IMD	Institute for Management Development
IMF	International Monetary Fund
IPN	Inflation Persistence Network
MERCOSUR	Mercado Común del Sur
NACE-BEL	Statistical Nomenclature of Economic Activities adjusted to Belgium
NAFTA	North American Free Trade Agreement
NAI	National Accounts Institute
NBB	National Bank of Belgium
NCB	National Central Bank
NEMO	National Employment Office
NMS	New Member States of the EU, which joined on 1 May 2004
NOFA	National Office for Family Allowances (for salaried workers)
NPO	National Pension Office
NSSO	National Social Security Office
NSSOPLA	National Social Security Office for the Provincial and Local Authorities
OECD	Organisation for Economic Co-operation and Development
PPS	Purchasing Power Standard
R&D	Research and Development
REACH	Registration, Evaluation and Authorisation of Chemicals
RTBF	Belgian French-speaking Radio and Television

S&P	Standard and Poor's
SME	Small and Medium-sized Enterprises
SOCX	Social Expenditure Database
TFP	Total Factor Productivity
UNCTAD	United Nations Conference on Trade and Development
USPTO	US Patent and Trademark Office
VAT	Value Added Tax
WTO	World Trade Organisation