

Quarterly Newsletter of the Federal Planning Bureau

Short Term Update (STU) is the quarterly newsletter of the Belgian Federal Planning Bureau. It contains, in English, the main conclusions from the publications of the FPB, as well as information on new publications, together with an analysis of the most recent economic indicators.

HEADLINES BELGIAN ECONOMY

In October, the FPB updated its medium-term outlook for Belgium until 2007. This projection is pointing towards a GDP growth of 2.5% on average from 2003 to 2007. This development can be largely accounted for by domestic demand, whereas the role of (net) exports is expected to be more limited. Private consumption should be more dynamic during the forecasting period than during the nineties thanks to a favourable development in households' disposable income (stimulated especially by reductions in personal income tax). The growth in gross fixed capital formation should attain an average of 2.9% during the period 2003-2007, notably reflecting the expansion in business investment. Export growth should be 5.1% on average: the structural loss in export market share should be confirmed and the contribution of net exports to GDP growth is expected to decline.

The inflation rate should be below 2% in the medium term. Assuming no shocks on commodity prices, the main domestic factors behind this moderate inflation are wage increases compatible with productivity gains, cuts in social security contributions and the extension of production capacity.

Employment should show a gradual improvement: an increase of 33,000 jobs on average should be observed during the 2003-2007 period (as compared with an increase of 40,000 jobs, on average, during the 1996-2000 period). However, a large proportion of the labour expansion should be absorbed by an increase in the labour force. Therefore, the unemployment rate in a broad sense should only decrease from 13.5% by mid-2002 to 13.2% in 2007.

Assuming no policy change but taking into account (as far as possible) the measures decided within the framework of the 2003 budget, the financing capacity of public administrations should be close to balance between 2003 and 2006 and a small surplus would be observed in 2007. Taking into account the computed output gap and the resulting cyclical budget component, the structural (cyclically adjusted) balance would be positive but slightly declining from 2002 onwards.

The objective of a positive financing capacity (0.5% of GDP in 2005 as mentioned in the new Stability Program for Belgium) is not expected to be reached without additional budgetary measures. However, the total public debt to GDP ratio should continue its decline, but at a slower pace if compared with the 2001 forecast. The decrease should represent about 21% of GDP between 2001 and 2007.

Editorial Board

Henri Bogaert
Michel Englert
Bart Hertveldt
Evelyne Hespel
Dominique Simonis
Joost Verlinden

DTP & Web Publishing

Adinda De Saeger
Geert Bryon
Dominique van der Wal

Printed by

Ministry of
Economic Affairs

STU 4-02 was finalised on November 29th 2002

The Federal Planning Bureau (FPB) is a public agency under the authority of the Prime Minister and the Minister of Economic Affairs. The FPB has a legal status that gives it an autonomy and intellectual independence within the Belgian Federal public sector.

FPB activities are primarily focused on macro-economic forecasting, analysing and assessing policies in the economic, social and environmental fields.



Table of Contents

Special Topic	3
• Stock market prices and economic growth	
Economic Forecasts	5
• Economic forecasts 2002-2007 of October 2002	
Summary of Economic Forecasts	7
• Economic forecasts for Belgium by different institutions	
• Economic forecasts for the euro area by different institutions	
Structural economic performance	8
• Introduction to structural economic performance	
• Key Indicators: openness	
• Key indicators: foreign direct investment	
• Key indicators: productivity and prices	
• Key indicators: internal market	
• Framework conditions: education	
• Framework conditions: R&D and innovation	
• Framework conditions: taxation	
• Network industries: telecommunications	
• Network industries: gas and electricity	
• Network industries: railways	
• Network industries: postal services	
Recent publications	19
• Monetary policy in the euro area	
• Constructing productive ICT capital stock series for Belgium	
• Qualifications and ICT: the role of education and training	
• Other Recent Publications	
• Research in progress	
Economic Policy Measures	23
• Recent history of major economic policy measures	
Abbreviations	24

All FPB publications, mentioned in this STU, can be obtained either by sending a fax (+32 2 5077373) or by filling in the necessary form on our Internet site (<http://www.plan.be>).

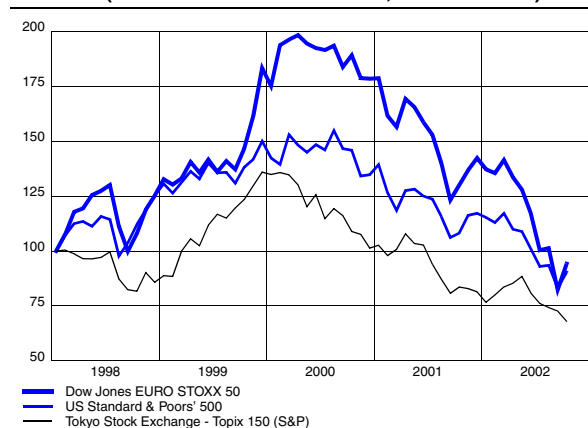
Stock market prices and economic growth

Following the recent fall in equity prices around the world, questions have been raised about the effect of the decline on the ongoing recovery. This special topic describes the main channels through which this fall can affect economic growth. More specifically, we will examine four transmission mechanisms and discuss their possible importance in the euro area as against the United States. Finally, some estimates of wealth effects on the Belgian economy will be presented.

New downward trend in equity prices since spring 2002

Triggered by the bursting of the technology bubble, equity prices in the three most advanced economies have been on an almost continuous downward trend since peaking in March 2000 (see graph below). After a brief recovery in the autumn of 2001, stock market prices have again fallen precipitately in the last few months. The recent collapse in equity prices is different in the sense that it is now widespread and is not mainly concentrated in the ITC sector. It reflects partly a loss of credibility of audited accounts, as a result of a number of accounting scandals in the United States. Between the end of March and the end of October 2002 the Dow Jones EURO STOXX 50 and the US Standard & Poors' 500 dropped by 33% and 23% respectively.

Graph 1 - Stock market indices
(end of month observations, 1998M1 = 100)



Equity price fluctuations and economic activity

The most thoroughly described and empirically tested channel between equity prices and economic activity in the economic literature is the so-called wealth effect on private consumption. The theory of permanent income tells us that, in addition to anticipated future income, an upward shift in financial and non-financial wealth which is perceived as permanent will induce consumers to spend more of their current income. Based on this mechanism, the impact of a shift in equity prices on con-

sumption will depend on two factors: the level of household equity holdings and the propensity to consume out of equity wealth.

Concerning the first factor, while US households' direct and indirect equity holdings, as a percentage of total financial assets, remained almost unchanged at around 30% between 1997 and 2000, in the euro area this share increased from 15% to 20% during the same period¹. This higher stock market exposure implies that, in comparison with a few years ago, a given fall in equity prices will mean a larger decrease in the financial wealth of households in the euro area.

Concerning the second factor, most empirical studies find that in the United States there is a significantly higher marginal propensity to consume out of equity wealth (between 0.03 and 0.05) than in most individual euro area countries (estimated at around 0.01). The explanation put forward is twofold. Firstly, in so-called market-based economies like the US, consumers are less credit-constrained in the sense that they have access to a wider range of credit instruments, which means that it is easier for households to borrow against their assets than in bank-based economies. Secondly, the higher propensity to consume out of wealth in the United States may also be due to the fact that a greater proportion of households have direct equity holdings as compared with the euro area.

Stock market prices can also impact consumption through a second channel. According to the dividend discount model, equity prices should reflect expected future dividends. Similarly, a decline in equity prices could be interpreted by households as an increased downward risk in relation to prospects for economic growth and employment. This may, in turn, harm consumer confidence and lead to an increase in the savings ratio, even if households do not possess equity holdings. A few empirical studies have found some evidence of a (weak) equity price effect on consumer confidence in the United States but no such relationship could be established for euro area countries.

Stock prices can also have a direct impact on business investment, mainly through two channels. The first channel operates via the cost of equity capital. A decrease in equity prices means that the market value of the firm relative to the replacement cost of its stock of capital (called Tobin's q in the literature) declines. As the cost of financing investment through new issues of equi-

1. European Central Bank, Monthly Bulletin, September 2002.

ties increases, the firm will lower its investment spending as some projects previously perceived as profitable will be cancelled. Capital stock will gradually adjust to the lower long-term level and q will return to its normal value. The second channel operates through the balance sheet effect. Decreasing equity prices erode corporate collateral and reduce the firm's ability to borrow and consequently to invest. The link between stock market prices and investment should be stronger in countries where firms rely more on equity funding (as in the United States), but investment also should not be immune to equity price movements in bank-based economies because in these countries financial institutions own large equity holdings and there can be substantial effects on their balance sheets. Nevertheless, only a relatively weak empirical relationship between stock price movement and business investment has hitherto been found for euro area countries¹.

According to the European Commission², the recent decrease in equity prices "...is somewhat atypical and could be associated with a stronger drop of investment than during previous stock market corrections". In a 'normal' situation, the downward revision of expected future earnings would be associated with reduced borrowing interest rates, reflecting lower growth prospects and lower inflation. But, as has already been mentioned, the current collapse is partly due to a loss of confidence in company balance sheets and it could, in this case, have contributed to a rising risk premium and reduced access to corporate loans, as reflected by increasing spreads on lower-grade corporate bonds since April of this year both in the United States and in Europe.

To summarize, there are good reasons to believe that the recent fall in equity prices will have a negative effect on consumption and investment, particularly now that stock market corrections have hit all the major economies simultaneously, which should reinforce the synchronization in business cycle movements.

Wealth effects for the Belgian economy

In view of the complexity of possible transmission channels involved, quantifying the impact of the stock market corrections on economic activity by using traditional econometric equations is a very delicate task, especially in the case of investment and where confidence effects play a major role. We will therefore limit our empirical analysis in relation to Belgium to the wealth effect on consumption.

To test the sensitivity of consumption relative to financial wealth we used the consumption function of the FPB

quarterly model for Belgium, MODTRIM II. Here we followed the specification proposed by INSEE³, which states that in the long run, private consumption is determined by current disposable income and wealth⁴ accumulated up to the previous quarter. In the short run, the qoq growth rate of private consumption is a function of its lagged growth rate, the evolution of disposable income, wealth, unemployment (to take the phenomenon of precautionary savings into account) and the time-lagged deviation from the long-term target.

To see what this dynamic implies in terms of the present drop in equity prices, we used this equation to simulate a shock corresponding to the actual decrease in broad-based stock price indices during the second and third quarters of this year. The shock implies a decrease in equity wealth of 6% in 2002Q2 and an additional drop of 20% in 2002Q3 compared to the baseline⁵. This gap between the current level and the baseline is kept constant afterwards.

Results in Table 1 only consider the purely accounting impact on direct equity holdings and do not take into account portfolio shift effects in favour of other assets.

Table 1 - Direct impact of falling equity prices on consumption through the wealth effect⁶

	2002Q3	2002Q4	2003Q4
households' equity wealth	-26.0	-26.0	-26.0
households' financial wealth	-5.8	-5.7	-5.5
private consumption	-0.06	-0.24	-0.29

To measure the impact of these wealth effects on economic activity, we have simulated this shock over the whole model so that multiplier effects are taken into account. It should be noted that we are not considering here the consequences that falling equity prices may have on investment through a rise in the cost of capital and on the international environment. As Table 2 shows, the decrease in equity prices through the wealth effect should affect GDP growth mainly during the fourth quarter of 2002. On a yearly basis the shock will have the greatest influence on the 2003 growth figures due to the carry-over.

Table 2 - Impact of decreasing households' equity wealth on economic activity⁶

	2002Q3	2002Q4	2003Q4
Total national expenditure	-0.06	-0.22	-0.24
GDP	-0.03	-0.12	-0.14

3. INSEE, Note de Conjoncture, décembre 2001.
4. For reasons of data availability only financial wealth is considered here. Consumption, disposable income and wealth are expressed in real terms.
5. A weighted average of euro area and US stock price indices is supposed to be representative for Belgian households' direct equity holdings. Investments in mutual funds are not taken into account.
6. In % differences from baseline. This baseline is a technical one different from the forecasts presented in STU 3-02.

1. See IMF, World Economic Outlook, May 2000.

2. See European Commission, Quarterly Report on the Euro Area, September 2002.

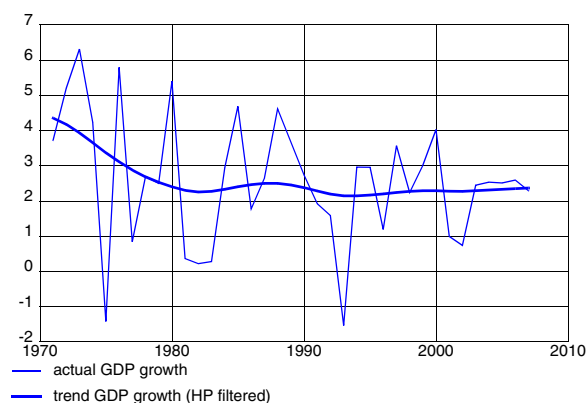
Economic forecasts 2002-2007 of October 2002

The FPB has prepared an update of its medium-term economic outlook, published in May 2002, for the 2002-2007 period. This new forecast serves as the macroeconomic basis for the computation of the new Belgian Stability Program (prepared for the 2002-2006 period). The exercise takes into account, as far as possible, the measures decided within the framework of the 2003 budget.

Updated medium-term economic outlook based on revised short-term evolution and on a less sustained development of potential markets in the medium term.

Based on an updated short-term forecast (see economic forecasts 2002-2003, September 2002) and on revised trend growth in potential export markets in the medium term, the new medium-term forecast shows average GDP growth reaching 2.2% during the period 2002-2007. As in the economic forecast for May 2002, this development can be largely accounted for by domestic demand. The role of (net) exports is expected to be more limited.

Graph 1 - Actual and trend growth of GDP



After moderate growth in 2002, the evolution of private consumption should be more dynamic during the 2003-2007 period, particularly thanks to a favourable development in households' disposable income (stimulated especially by major tax reforms). The growth in gross fixed capital formation should attain an average of 2.9% during the 2003-2007 period, notably reflecting the expansion in business investment.

Export growth is expected to be slightly negative in 2002, due to the unfavourable international context and a decreasing export market share. Thereafter export growth should be 5.1% on average: the loss in export market share should be confirmed and the contribution of net exports to GDP growth should decline. Nevertheless, the external surplus should slightly increase (partly due to the recovery of the terms of trade).

Inflation remains below 2% in the medium term in absence of shocks affecting commodity prices

Limited wage increases (accelerating but still compatible with productivity gains), cuts in social security contributions, and the expansion of production capacity are the main domestic factors behind an inflation rate that will remain below 2% in the medium term (1.7% on average for the period 2003-2007). The hypothesis of an absence of shocks affecting commodity prices (as stipulated in the baseline scenario) also helps to moderate inflation.

Employment growth not sufficient to reduce the unemployment rate sufficiently

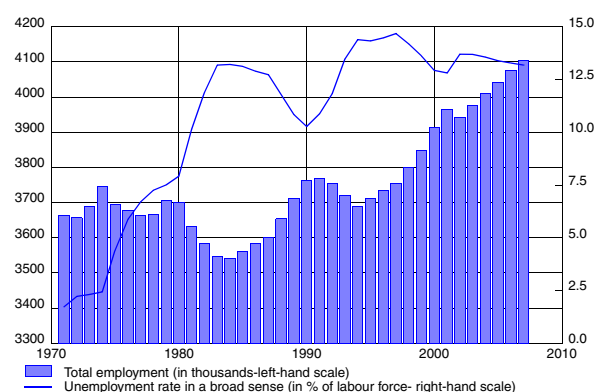
Another crucial result of the forecast concerns employment. Employment figures should show a gradual improvement: after a reduction in 2002, an increase of 33,000 jobs on average should be observed during the 2003-2007 period (as compared with an increase of 40,000 jobs on average during the 1996-2000 period). This result can be explained by the favourable macroeconomic context, with GDP growth recovering from only 0.7% in 2002 to 2.5% on average during the 2003-2007 period. Limited wage increases (introduced as a hypothesis within the framework of the 1996 law on the promotion of employment and safeguarding competitiveness) should also help to create employment. Finally, various measures taken in favour of employment (mainly activation and insertion programs) should also play a part.

The decline in industrial employment should continue, with the number of jobs lost in manufacturing industry reaching 39,000 during the 2002-2007 period. At the same time the number of jobs created in market services should reach 178,000, bringing the share of employment in market services up to more than 56% of total employment (42% in 1980 and 50% in 1990).

Since the increase in the labour force will be significant (see Perspectives économiques-Economische vooruitzichten 2002-2007, April 2002, chapter 5), this should absorb the growth in employment. The unemployment rate in a broad sense should therefore only decrease from 13.5% in 2002 to 13.2% in 2007. The ageing of the labour force will boost the proportion of older unemployed people. However, due to the implementation of recent policy measures that make early retirement from the labour market more difficult, an increasing proportion of unemployed people aged 50 and over will be required to accept relevant job offers and hence remain available for the labour market. As a result, the number

of early retirements will no longer increase and the official unemployment rate (excluding older unemployed people who are no longer required actively to search for a job) should decline at almost the same rate as the unemployment rate in a broad sense (from 10.2% in 2002 to 10% in 2007).

Graph 2 - Employment and unemployment



Source: Hermes projection, october 2002 (based on national account statistics, april 2002).

Public finances close to balance during the forecasting period

On the assumption of no changes in policy but taking into account (as far as possible) the measures decided within the framework of the 2003 budget, public expenditure is forecast to grow more slowly than GDP. Due to the further reduction in social security contributions and the introduction of an important tax reform, global fiscal pressure should also decrease until 2006.

The financing capacity of public administrations should be close to balance between 2003 and 2006: a sharp reduction in interest payments (1.6% of GDP during the forecasting period) should compensate for a substantial deterioration in the primary surplus. Note that a surplus

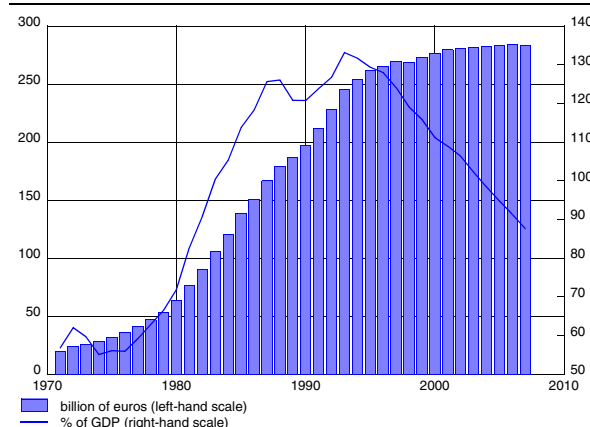
would be seen at the end of the projection (2007).

Taking into account the calculated output gap and the resulting cyclical budget component, the structural (cyclically adjusted) balance would be positive but slightly declining from 2002 onwards.

The improvement in the public financing balance should be mainly situated in the Federal government. Indeed, the Federal government should benefit from the interest charges reduction.

The ambitious objective of a positive financing capacity from 2003 onwards (mentioned in the Stability Programme for Belgium 2002-2005) is not expected to be achieved without additional budgetary measures. The total public debt to GDP ratio should, however, continue to decline, but at a slower pace as compared with the 2001 forecast. The decrease should represent about 21% of GDP between 2001 and 2007. Even in nominal terms, the amount of debt should be more or less stabilized.

Graph 3 - Total public debt¹



1. Federal Planning Bureau definition

Table 1 - Key figures for the updated medium-term economic outlook of October 2002 (period averages - changes in volume unless otherwise stated)

	1991-1995	1996-2000	2001-2002	2003-2007
Potential export market	5.7	7.9	1.2	5.7
Private consumption	1.6	2.4	1.0	2.3
Public consumption	1.5	2.0	1.7	1.7
Gross fixed capital formation	-0.4	3.7	-1.1	2.9
Stock building (contribution to GDP growth)	0.1	0.0	0.1	0.0
Final domestic demand	1.2	2.6	0.8	2.3
Exports	3.8	5.9	-0.7	5.1
Imports	3.4	5.8	-0.9	5.1
Net exports (contribution to GDP growth)	0.4	0.3	0.1	0.3
GDP	1.6	2.8	0.9	2.5
Private consumption prices	2.4	1.7	2.0	1.7
Real disposable income households	2.1	1.1	1.2	2.3
Domestic Employment (annual changes in '000)	-10.4	40.1	14.0	32.5
Unemployment rate (level, 30 June, in percent of labour force) ^a				
-including older unemployed people	14.3	12.9	13.5	12.9
-excluding older unemployed people	12.9	10.0	10.2	10.0
Current account balance (% of GDP)	3.1	5.0	4.8	5.2
General Government financing capacity (% of GDP)	-6.4	-1.4	0.1	-0.1

a. end of period

Economic forecasts for Belgium by different institutions

	GDP-growth		Inflation		Government Balance		Date of update
	2002	2003	2002	2003	2002	2003	
Federal Planning Bureau	0.7	2.6	1.5	1.4	.	.	9/02
INR/ICN	0.7	2.6	1.5	1.4	.	.	9/02
National Bank of Belgium	0.7	.	1.5	.	0	.	11/02
European Commission	0.7	2.0	1.6	1.4	-0.1	0	11/02
OECD	0.7	2.1	1.6	1.4	0	0	11/02
IMF	0.6	2.2	1.6	1.2	-0.1	-0.3	9/02
BBL	0.5	1.8	1.5	1.5	-0.2	-0.1	10/02
Fortis Bank	0.6	1.6	1.7	1.5	-0.1	-0.3	11/02
Dexia	0.7	2.0	1.7	1.6	.	.	11/02
KBC Bank	0.6	1.8	1.7	1.3	-0.2	-0.2	11/02
Morgan Stanley	0.7	1.7	1.7	1.7	-0.2	-0.3	10/02
Petercam	0.5	1.25	1.7	1.0	-0.1	.	11/02
IRES	0.5	1.8	1.6	1.7	-0.2	-0.5	9/02
DULBEA	0.8	1.5	1.75	1.5	0	-0.75	11/02
Consensus Belgian Prime News	0.8	2.2	1.6	1.3	-0.3	-0.1	9/02
Consensus Economics	0.7	1.7	1.7	1.6	.	.	11/02
Consensus The Economist	0.6	1.8	1.7	1.4	.	.	11/02
Consensus Wirtschaftsinstitute	0.5	1.8	1.6	1.6	-0.8	-0.8	10/02
Averages							
All institutions	0.6	1.9	1.6	1.4	-0.2	-0.3	
International public institutions	0.7	2.1	1.6	1.3	-0.1	-0.1	
Credit institutions	0.6	1.7	1.7	1.4	-0.2	-0.2	

Collaborating institutions for The Economist:

ABN Amro, Deutsche Bank, EIU, Goldman Sachs, HSBC Securities, KBC Bank, Merrill Lynch, J.P. Morgan, Morgan Stanley, Nordbanken, Primark Decision Economics, BNP Paribas, Royal Bank of Canada, Salomon Smith Barney, Scotiabank, Shinsei Bank, UBS Warburg.

Wirtschaftsforschungsinstitute:

Deutsches Institut für Wirtschaftsforschung (Berlin), Information- und Forschungsinstitut (München), Hamburgisches Welt-Wirtschafts Archiv (Hamburg), Institut für Weltwirtschaft (Kiel), Rheinisch-Westfälische Institut für Wirtschaftsforschung (Essen), Institut für Wirtschaftsforschung (Halle)

Economic forecasts for the euro area by different institutions

	GDP-growth		Inflation		Government Balance		Date of update
	2002	2003	2002	2003	2002	2003	
European Commission	0.8	1.8	2.3	2.0	-2.3	-2.1	11/02
OECD	0.8	1.8	2.4	2.2	-2.2	-2.1	11/02
IMF	0.9	2.3	2.1	1.6	-1.9	-1.5	9/02
Fortis Bank	0.8	2.5	2.1	1.9	-1.9	-1.5	11/02
Dexia	0.8	1.9	2.2	1.8	.	.	11/02
KBC Bank	0.8	1.8	2.3	1.6	-2.2	-2.5	10/02
Goldman Sachs	0.7	1.8	2.2	1.5	-2.2	-2.0	10/02
J.P. Morgan	0.8	1.9	2.3	1.6	-2.4	-2.2	10/02
Morgan Stanley	0.7	1.5	2.3	1.7	-2.2	-2.0	10/02
Consensus AIECE	0.8	2.1	2.1	1.8	-2.1	-1.8	10/02
Consensus Wirtschaftsforschungsinstitute	0.8	1.8	2.2	1.8	-2.3	-1.9	10/02
Consensus The Economist	0.7	1.7	2.2	1.7	.	.	11/02
Averages							
All institutions	0.8	1.9	2.2	1.8	-2.2	-2.0	
International public institutions	0.8	2.0	2.3	1.9	-2.1	-1.9	
Credit institutions	0.8	1.9	2.2	1.7	-2.2	-2.0	

Collaborating institutions for The Economist:

ABN Amro, Deutsche Bank, EIU, Goldman Sachs, HSBC Securities, KBC Bank, Merrill Lynch, J.P. Morgan, Morgan Stanley, Nordbanken, Primark Decision Economics, BNP Paribas, Royal Bank of Canada, Salomon Smith Barney, Scotiabank, Shinsei Bank, UBS Warburg.

Wirtschaftsforschungsinstitute:

Deutsches Institut für Wirtschaftsforschung (Berlin), Information- und Forschungsinstitut (München), Hamburgisches Welt-Wirtschafts Archiv (Hamburg), Institut für Weltwirtschaft (Kiel), Rheinisch-Westfälische Institut für Wirtschaftsforschung (Essen), Institut für Wirtschaftsforschung (Halle)

Introduction to structural economic performance

In this Newsletter the FPB begins an annual review of structural developments in the goods and services markets in the Belgian economy. The review consists of an international benchmarking process with about thirty indicators.

The rationale for analysing structural developments

Economic growth and the standard of living are often considered in relation to the business cycle and thus from a short-term perspective. As is well known, however, from a longer term perspective structural characteristics are also important. Growth and the average standard of living are also determined by the allocation of labour and capital, which is supported by effectively functioning markets.

This is also recognised by the European Council. One of the key aims of EU policy is to reform the markets of products, labour and capital in order to increase economic efficiency. At the Lisbon summit (2000), the Council explicitly defined this as a strategic objective. Structural reform and innovativeness are some of the means of reaching this objective.

Earlier, at the Cardiff summit (1998) the Council began a process of monitoring the progress of market reforms. A database of Structural Indicators has also been developed. This database consists of tens of indicators *e.g.* on market reform, innovation and the environment.

Overview of the indicators

This Newsletter gives an overview of how structural developments in Belgium compare to those elsewhere in Europe and the world. It is the first time that this theme has been addressed, and the intention is to review the subject annually. The overview consists of 34 indicators split up into three categories:

- **Key indicators.** First, six indicators on openness and FPB show how Belgium *performs* in terms of competitiveness, which follows on from the functioning of the goods and services markets. The other indicators (and also those for the next two categories) then show a number of *determinants* of competitiveness. As key indicators, productivity, prices and state aid are obvious pointers to how the market is functioning.
- **Framework conditions:** Innovation and attractiveness to foreign investors are essential factors determining competitiveness. They are influenced by education and R&D, which may increase efficiency and reduce prices. They are also influenced by taxation, which may have an adverse effect on the way in which markets operate.
- **Network industries:** Market reforms in network industries were especially needed because of inefficiencies due to many years of protection. The

emphasis is on the level of prices as an indicator of market performance. The four industries considered here are telecommunications, energy, railways and postal services. They deliver essential inputs for other industries.

Summary of Belgium's performance

In international benchmarking there can sometimes be ambivalence about the interpretation of 'better' and 'worse'. For example, state aid can be better for some companies but worse for competitiveness. Here, 'better' and 'worse' are interpreted from the perspective of market performance.

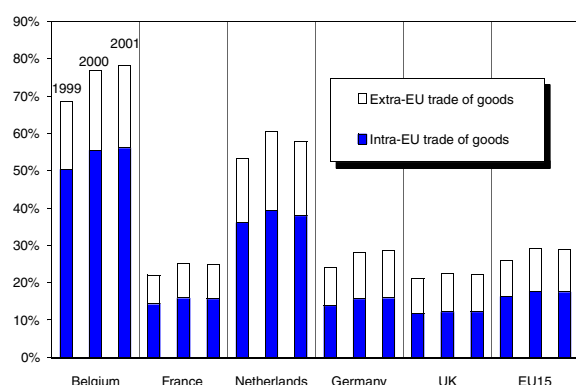
In general, Belgium does not perform better or worse than the other member states. When considering the individual indicators, however, there are differences. Compared to the EU average, Belgium performs well in productivity and the number of people with higher education. Belgium performs poorly on indicators for labour taxes, state aid, venture capital and network industries (except gas, where its performance is better than the EU average). The performance could be improved, particularly in the areas of state aid, telephone charges and railway efficiency.

Considering the evolution of the indicators, Belgium has caught up with the EU average for R&D expenditure and openly advertised public procurement. In 1995 its performance was below the EU average but in 2000 it was equal. Mobile phone penetration is also catching-up, but is still 7% below the EU average.

When benchmarking Belgium against the neighbouring countries rather than the EU average, the above conclusions basically remain the same. An exception is R&D expenditure, where Belgium's performance is the same as the EU average, but worse than the neighbouring countries. For those indicators where sufficient data was available, a benchmarking process against the USA and Japan was carried out. In comparison with Belgium, but also against the EU as a whole, the USA and Japan perform better in terms of R&D, innovation, fiscal pressure, pricing of network services and venture capital. The US performance is worse on labour cost and price levels and Japan performs worse on price levels and productivity. Note from the graphs that 'better' and 'worse' often mean 'very much better' and 'very much worse'.

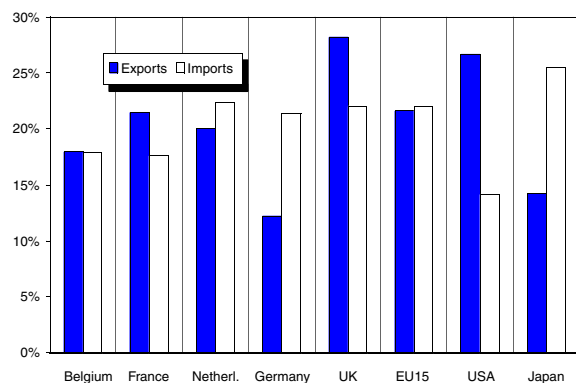
Key Indicators: openness

Graph 1 - Degree of openness, in % of GDP, 1999-2001



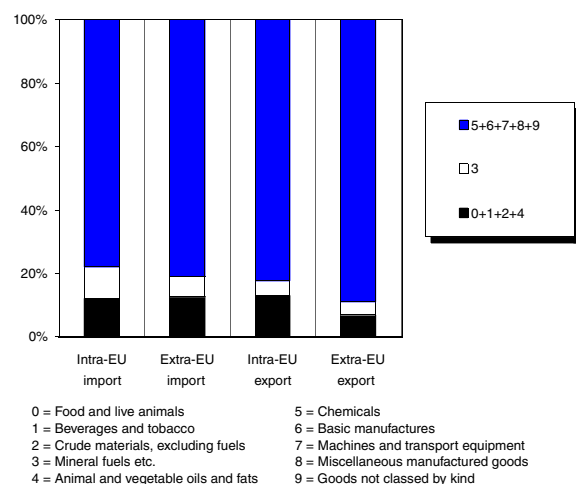
Source: Eurostat, Comext, NewCronos

Graph 2 - Share of commercial services in trade, 2001



Source: WTO and NBB/BNB

Graph 3 - Sectoral composition of Belgian trade, 2000*



Source: Eurostat, Comext

(*) According to the SITC3-classification:

- 0 = Food and live animals
- 1 = Beverages and tobacco
- 2 = Crude materials, excluding fuels
- 3 = Mineral fuels etc.
- 4 = Animal and vegetable oils and fats
- 5 = Chemicals
- 6 = Basic manufactures
- 7 = Machines and transport equipment
- 8 = Miscellaneous manufactured goods
- 9 = Goods not classed by kind

The market openness of all the major economies has increased over the past years. Most of the direct trade restrictions, including tariffs and non-tariff barriers, have fallen, albeit at different speed across sectors. The degree of openness, however - calculated as the average share of imports and exports of goods in GDP - differs between the countries under review.

In 2001, the degree of openness of the economy reached 78.2% in Belgium. This was much higher than in Germany (28.7%), France (24.9%) and higher than in the Netherlands (57.8%). The degree of openness of the United States (9.2%) and Japan (8.9%) was similar to that of the European Union (11.4%) when only extra-EU trade is considered.

The role of foreign trade has traditionally been very important in Belgium. This is partly due to the small size of the economy. It also reflects the deep economic integration of Belgium within the EU, especially with the neighbouring countries, as demonstrated by the high contribution of intra-EU trade to Belgium's degree of openness.

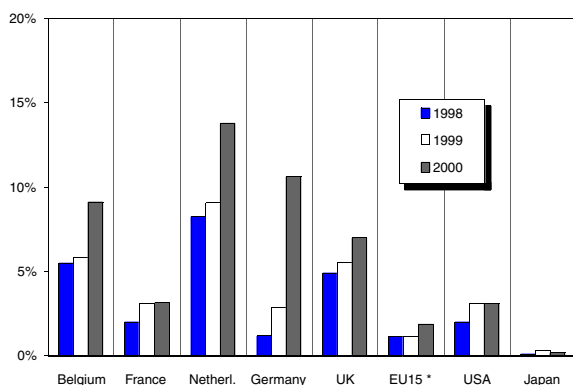
Although it has grown rapidly, the share of services in international trade is still minor in comparison to the share of goods, and also much lower than the contribution of services to the domestic economies of the countries under review. In Belgium, the share of commercial services reached 18% in 2001 on both the import and the export sides. Trade in services, however, is derived from balance of payments statistics and does not correspond to the merchandise trade statistics given elsewhere. It is likely that for most economies trade in commercial services is understated.

Belgium's sectoral trade pattern reflects the importance of three groups of manufactured products on both the import and the export sides: chemical products, basic manufactured goods and machines and transport equipment.

The main differences in the sectoral composition of intra-EU and extra-EU trade are due to a higher share of agricultural products and crude materials (SITC 0+1+2+4) in the intra-EU exports and a higher share of mineral fuels (SITC 3) in the intra-EU imports.

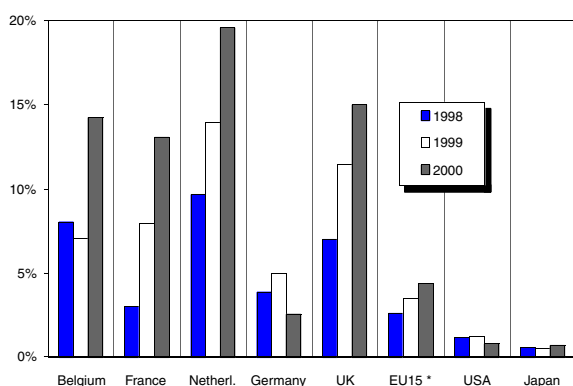
Key indicators: foreign direct investment

Graph 4 - Inward FDI in % of GDP



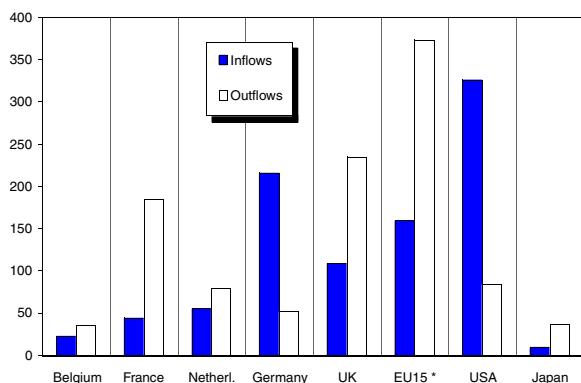
Source: Eurostat (NewCronos) and NBB/BNB
(* Net of Intra-EU flows)

Graph 5 - Outward FDI in % of GDP



Source: Eurostat (NewCronos) and NBB/BNB
(* Net of Intra-EU flows)

Graph 6 - Foreign direct investment flows in billion EUR, 2000



Source: Eurostat (NewCronos) and NBB/BNB
(* Net of Intra-EU flows)

The continuing globalisation of the economy in the coming years will make trade and foreign direct investment more and more important in explaining long-term economic growth. The increasing role of multinational companies and the process of mergers and acquisitions account for much of the evolution of foreign direct investment in the countries under review.

The simplification of the regulatory framework governing foreign investments in all the OECD countries has favoured increased FDI flows and contributed to the globalisation of production systems. As in the case of trade, however, the degree of internationalisation --calculated as the share of foreign direct investment flows in GDP-- varies significantly across countries. Over the 1998-2000 period, while the foreign investment outflows as a percentage of GDP were very low in the United States and in Japan (1.04% and 0.58% of GDP on average, respectively), they reached 3.47% of GDP on average in the European Union. Over the same period, the foreign investment inflows were much lower in Japan (0.19% of GDP on average) than in the European Union and in the United States (1.37% and 2.72% of GDP on average, respectively).

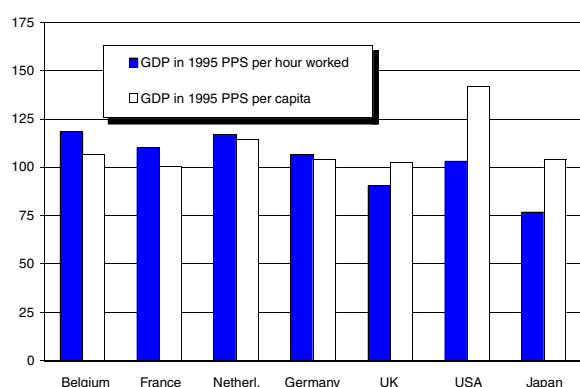
Over the 1998-2000 period, Belgium attracted a large volume of direct investment from abroad as a percentage of GDP. Inward direct investment increased from 5.5% in 1998 to 9.1% in 2000. The same period also saw a large volume of foreign direct investment from Belgium as a percentage of GDP. Outward direct investment from Belgium increased from 8% in 1998 to 14.2% in 2000. The data for Belgium concerning inward and outward direct investment, however, are overestimated. A large proportion of Belgium's foreign direct investment is related to the fiscal incentive benefiting coordination centres whose financial operations are realised among companies associated with the same group.

Among the countries under review, the highest scores for inward and outward direct investment as a percentage of GDP during the same period were achieved in the Netherlands, followed by the United Kingdom.

In 2000, France, the UK and the European Union as a whole were important net exporters of foreign direct investment, while Germany and the United States were net importers.

Key indicators: productivity and prices

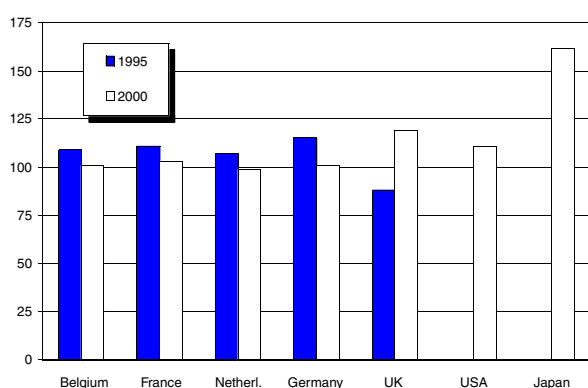
Graph 7 - Productivity and living standard (2001, EU15=100)



Source: Eurostat, NewCronos (domain National Accounts)
PPS=purchasing power standard

Labour productivity in Belgium, measured in the form of *GDP per hour worked*, was 18% higher than the EU average in 2001. It was also higher than in the neighbouring countries and higher than in the USA and Japan. These findings, however, differ from the observations for *GDP per capita*, indicating differences in employment rates between countries. For *GDP per capita*, the difference between Belgium and the EU average is only 6% instead of 18%, and the difference with the neighbouring countries is smaller too. At present, only the Netherlands achieved a better performance, with *GDP per capita* 8%-points higher than in Belgium. Convergence between European countries seems to be stronger in terms of *GDP per capita* as compared with *GDP per hour worked*.

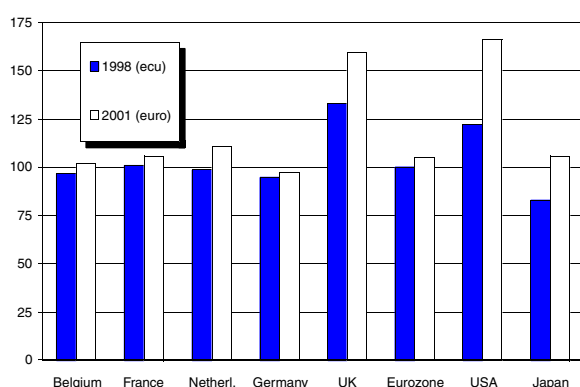
Graph 8 - Relative price levels (EU15=100)*



Source: Eurostat, NewCronos (domain Structural Indicators)
(* Index of private final consumption, measured as the ratio between PPP and market exchange rate
PPS=purchasing power parity

The index for *GDP per capita* is inferior to the index for *GDP per hour worked*, except for the UK. The same observation is true for the USA and Japan. Part of the explanation is that employment rates are higher in these countries than in continental Europe. Note that the difference between *GDP per hour worked* and *GDP per capita* indices is larger in the USA and Japan than in Europe.

Graph 9 - Labour cost per unit of value added (1995=100)*



Source: European Commission, Ameco database
(* Nominal total labour cost per unit of real value added for the total economy

Relative price levels are the ratio between PPP and the market exchange rate for each country. The ratio is shown in relation to the EU average. According to this measure, the 1995 price level in Belgium was relatively close to the EU average. This observation also holds true for the other European countries, although to a lesser extent in Germany and the UK. Price convergence among countries seems to be taking place to a certain extent, but not with respect to the UK. This convergence seems to be even stronger on the basis of estimates for 2001 (which are not shown in the graph), except again for the UK. In 2000, price levels in the USA and Japan were higher than the European average.

In comparison with 1995, nominal unit labour cost (ULC), which is an important indicator of cost competitiveness, has increased only slightly in Belgium (at 2.1%). For the 12 countries in the Eurozone, ULCs have increased slightly more (by 5.1%), so that the Belgian competitive position has improved slightly.

Looking at the underlying reasons for this, it appears that Belgian wages have increased rather less (by 11.1% as compared with 12.5%) and labour productivity somewhat more (with 8.8% as against 7%) than the Eurozone averages. All in all, however, differences with the other Eurozone countries are small. Major improvements in cost competitiveness have been observed in relation to the US and the UK, due to the appreciation of the currencies of these countries.

Key indicators: internal market

Table 1 - Share of state aid by sector (2000)

	Manufacturing	Financial services	Media, Culture & Services	Employment & Training*	Transport	Agriculture & Fisheries	Coal
Belgium	18%	0%	0%	6%	64%	12%	0%
France	29%	4%	1%	0%	39%	21%	6%
Netherlands	19%	0%	1%	0%	53%	28%	0%
Germany	36%	0%	0%	0%	39%	7%	19%
UK	19%	0%	2%	20%	39%	16%	3%
EU15	29%	1%	1%	4%	39%	17%	9%

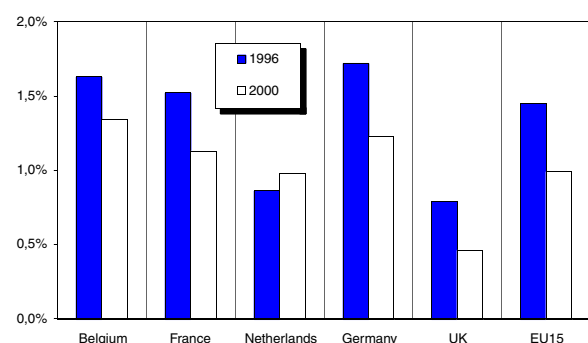
Source: European Commission, DG Competition
 (*) This is a "horizontal" type of state aid, as it may be granted to all economic sectors, for employment and training purposes.

Table 2 - Share of state aid by instrument, manufacturing only (average 1998 - 2000)

	Grants	Tax exemptions	Equity participations	Soft loans	Tax deferrals	Guarantees
Belgium	74,6%	16,7%	3,4%	4,1%	0,5%	0,9%
France	42,6%	46,4%	0%	7,6%	0,4%	3,0%
Netherlands	77,6%	11,4%	0%	6,0%	3,8%	1,2%
Germany	55,7%	26,1%	0,1%	11,7%	1,2%	5,3%
UK	95,8%	0,7%	0,9%	2,6%	0%	0%
EU15	63,1%	25,0%	0,6%	7,8%	0,6%	2,8%

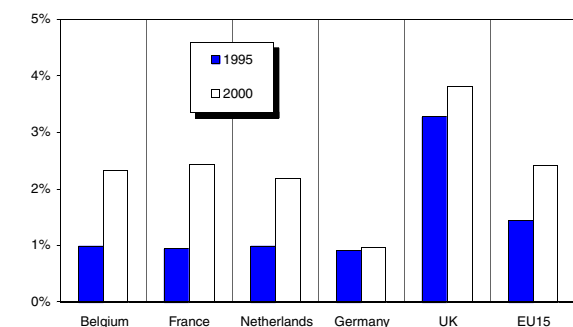
Source: European Commission, DG Competition

Graph 10 - State aid, as % of GDP



Source: European Commission, DG Competition

Graph 11 - Public procurement, as % of GDP*



Source: Eurostat, NewCronos (domain Structural Indicators)
 (*) Openly advertised procurement only

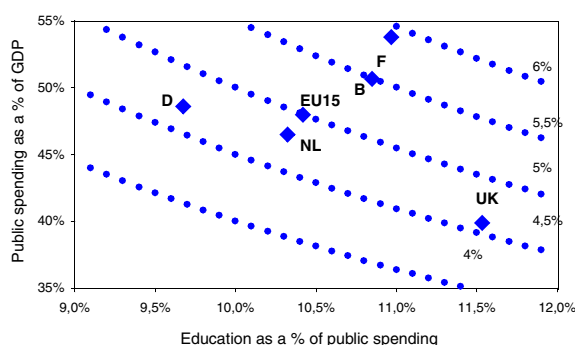
One of the keys to the completion of the internal market is the elimination of distortions in competition caused by state aid. State aid can take many forms. It may be direct aid such as grants, capital injections, reduced interest rates and loan guarantees. It may be indirect aid, for example waived revenues such as tax allowances, special tax regimes, social security reductions or payment arrears and non-performing loans. Aid from European funds and financial support for unemployed people is not included. Besides regional aid, State aid can be either horizontal or vertical. The former is granted throughout the economy and the latter to specific sectors or enterprises. In general, vertical aid is considered to distort competition.

With regard to manufacturing, the main instrument of State aid is direct aid in the form of grants, 63% of the total in the EU, but there is also significant indirect aid in the form of lower taxes. In 2000, 64% of all aid in Belgium was granted to transport, and almost all of this went to the railways. This was significantly higher than in other countries. For the period 1996-2000 – not shown here – the shares of aid have been relatively stable. Total state aid as a percentage of GDP shows a declining trend.

Another area in which progress is being made towards an internal market is the increasing amount of openly advertised public procurement. The estimate only covers procurement for which tenders have to be published in the Official Journal. The figure does not, therefore, include procurement that falls below the thresholds of the relevant Directives. There may also be an element of non-compliance with the Directives.

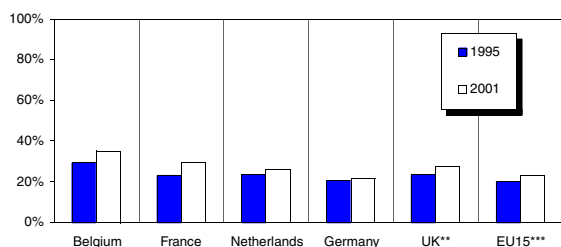
Framework conditions: education

Graph 12 - Public spending on education (1999)



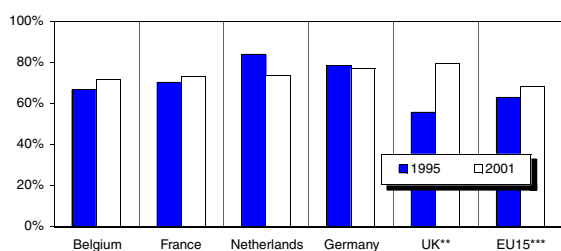
Source: Eurostat, NewCronos (domain Education)

Graph 13 - People with higher education *



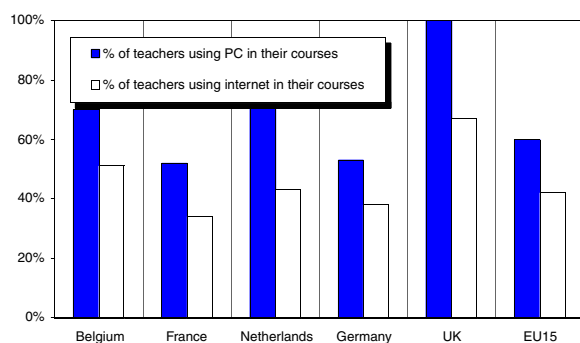
Source: Eurostat, NewCronos (domain Labour Force Survey)
 (*) Percentage of people aged 25-39 who completed higher education (ISCED 5-6),
 (**) Estimation, (***) 2000

Graph 14 - People educated to higher secondary level*



Source: Eurostat, NewCronos (domain Labour Force Survey)
 (*) Percentage of people aged 25-39 who completed at least higher secondary education (ISCED 3-6), (**) Estimation, (***) 2000

Graph 15 - Use of ICT at school (2001)



Source: European Commission, Eurobarometer Flash

Education is a central factor in the process of building human capital suited to the opportunities and constraints of the 21st century knowledge society. The availability of a skilled labour force is an essential condition for competitiveness, which is improved through high levels of productivity in goods and services markets. The importance of this for the development of welfare is increasingly being recognised throughout the world. Moreover, the current wave of innovation also requires frequent updating of labour force qualifications. Belgium is well placed to take advantage of these developments. On several aspects of education, it is well ahead of other countries.

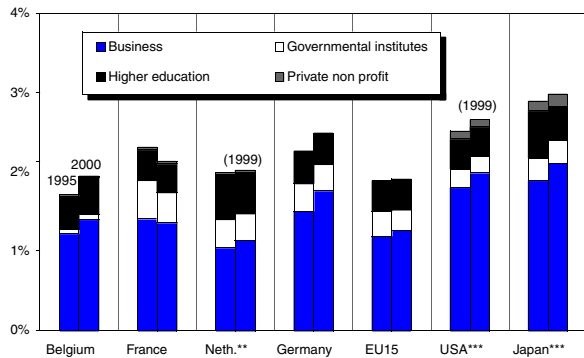
Belgium characteristically has quite a high level of public investment in education. About 5.5% of GDP is currently devoted to education. This is slightly below the French level, but above that of Germany, the Netherlands and the UK. Graph 12 shows public expenditure for education as a percentage of GDP along the curved dotted lines. The relatively high Belgian ratio may be explained by the combination of two factors, shown on the horizontal and vertical scales. On the one hand, the Belgian public authorities devote an important share of their budget to education: about 11%, which is almost the same as in France. On the other hand, public expenditure is a large component of GDP: more than 50%. Note that the UK has low overall public spending, but still devotes about 4.5% of its GDP to publicly financed education. In the USA and Japan, public expenditure on education is about 5% and 3.5% of GDP respectively (figures for 1998).

With regard to the highly skilled population, the percentage of people aged between 25 and 39 who have a tertiary education diploma is relatively large in Belgium. This share is close to (but still higher than) the French and British share, but significantly higher than the Dutch and German shares. The variability in the length of studies, and the fact that German students are older than Belgian students on average (partly because many begin their tertiary studies at a higher age) provides only part of the explanation. The number of people with secondary education is relatively low.

Among the countries shown on the graphs, the UK, Belgium and the Netherlands have the highest penetration rate of information and communication technologies (ICT) in education. What is more, Belgian teachers are very familiar with the use of computers in their classrooms. This result comes from a survey, however, rather than from a census. Nevertheless, more than half of teachers said that they use the Internet in the context of their classes.

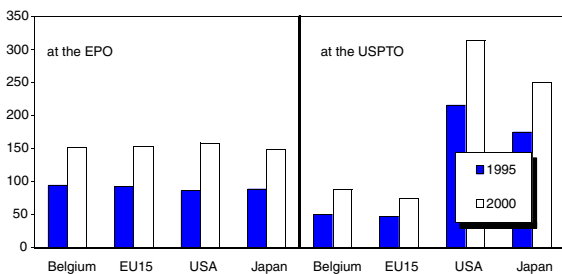
Framework conditions: R&D and innovation

Graph 16 - R&D expenditure by sector, as % of GDP*



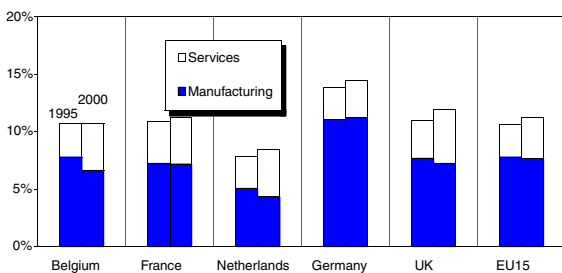
Source: Eurostat, NewCronos (domain R&D Expenditure and Personnel)
 (*) Sectors are defined as 'institutional' sectors, (**) 1999 is estimated, (***) Estimations

Graph 17 - Patent applications per million inhabitants



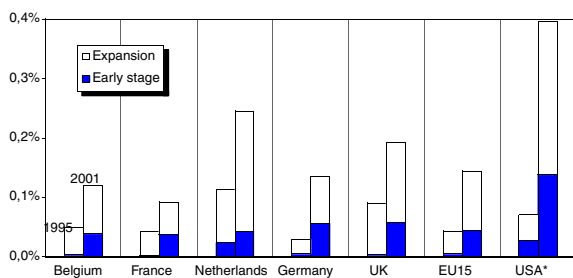
Source: Eurostat, NewCronos (domain Structural Indicators)

Graph 18 - Share of MHT sectors in total employment*



Source: Eurostat, NewCronos (domain Employment in High Technology Sectors)
 (*) MHT = medium- and high-technology sectors

Graph 19 - Venture capital investment as % of GDP



Source: Eurostat, NewCronos (domain Structural Indicators)
 (*) Estimations

Due to the rapid diffusion of new technologies and growing competition in the markets, R&D and innovation have become some of the most important factors in economic development. One major claim of the "new economy" is that it develops internal innovation and R&D capacities in enterprises, organisations and institutions. Compared to its neighbours and main competitors, the Belgian position has always been one of contrasts: R&D and innovation indicators have long been considered as weak, while labour productivity and international trade performance are among the best in the world. Recent indicators show a significant improvement in R&D and innovation, mainly driven by incentives from regional policies. The public contribution to R&D is still below the European average and even well below that of its main competitors. The gap, however, has been reduced.

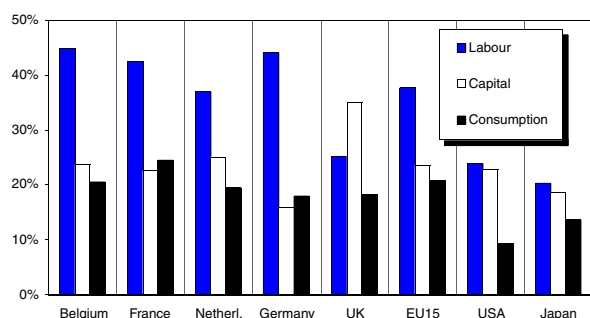
The intensity of R&D expenditure in commercial enterprises has increased rapidly, especially during 1998-2000. The ratio of business R&D to GDP in Belgium is now above the EU average although it remains well below that of USA and Japan. One striking fact is the concentration of R&D in a few sectors, mainly medium-high tech branches (MHT, see glossary). These MHT branches represent around 10% of Belgian employment. In the second half of the nineties, most SMEs and traditional sectors in Belgium appeared to be "not innovative or only slightly innovative". Some low-tech sectors such as textiles, food and non-metallic mineral products, do nevertheless seem to have increased their R&D expenditure quite rapidly in recent years.

The quality of research is one of the strengths of the Belgian innovation system. It has always been considered to be high, although the economic "output" is relatively weak. Another sign of improvement is the growing number of patent applications filed at the European and US Patent Office (EPO and USPTO, respectively), in which more than 60% growth was observed during 1995-2000.

Easy access to venture capital and a well-educated population should facilitate the diffusion of innovation, while the lack of scientific and engineering graduates among the young population could slow the rate of changes. Only 5% of those aged 20-29 in Belgium graduated in scientific and engineering disciplines, as compared with 11% in the EU as a whole.

Framework conditions: taxation

Graph 20 - Effective tax rates (1999)*

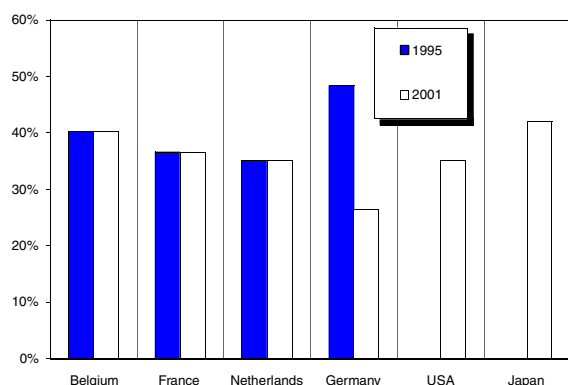


Source: European Commission, European Economy
 (*) Effective rates are obtained by relating the broad categories of tax revenues to the corresponding taxable bases: for labour, social security contributions and other payroll taxes as a ratio of gross wages; for capital, personal income taxes attributable to capital income, taxes on corporate income and property taxes, as a ratio of the adjusted gross operating surplus; for consumption, indirect tax revenue as a ratio of (private and public) consumption, excluding wages paid by general government.

When considering the functioning of goods and services markets, taxes have an impact on the supply of goods and services and the demand for them. Taxes also influence the country's overall competitive position.

In comparison with other countries, the overall tax burden in Belgium is high, reflecting the preference to finance many services (i.e. public consumption, social security spending etc.) from public resources. The effective tax rate on consumption is comparable to the EU average. Labour, however, is heavily taxed in Belgium (44.8% of gross wages, as compared with an EU average of 37.6%). These figures reflect high social security contributions and high personal taxes. In both of these areas, however, Belgian policy since 1999 (the situation shown in the graph) has aimed at reducing these taxes. The total wage wedge has decreased from 51.9% in 1999 to 51.4% in 2002.

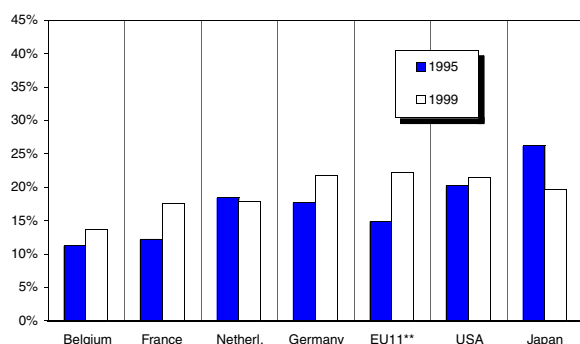
Graph 21 - Statutory corporate tax rates



Source: G. Nicodème (2001), Computing effective corporate tax rates: comparisons and results

The effective tax rate on capital is close to the EU average. Looking specifically at corporate taxes, the effective rate in the manufacturing sector is significantly lower than the statutory tax rate. It is also much lower than the EU average. In Belgium, companies are taxed at a 39% statutory rate on taxable income. Reduced rates (ranging from 28% to 39%) are applicable for SMEs, where the taxable income does not exceed a certain level and other conditions are satisfied (concerning inter alia the payments of fees to directors, coordination centres, shareholding of the company and the payment of dividends). These rates do not include the 3% surcharge. The effective corporate tax rate for large companies is smaller than the rate for small companies. Relatively low effective rates are also observed in the energy and water, manufacturing industry and trade sectors, while they are higher in building and civil engineering.

Graph 22 - Effective marginal tax rates for manufacturing*

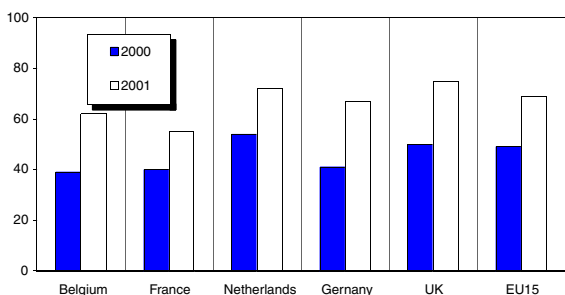


Source: G. Nicodème (2001), Computing effective corporate tax rates: comparisons and results
 (*) Ratio of corporate tax paid on gross operating surplus (i.e. before depreciation). Data from the Bach database on individual enterprises is used.
 (**) EU15 excluding the United Kingdom, Ireland, Greece and Luxembourg

The government is planning to revise the corporate tax system from January 2003 onwards. The reform relates to the reduction of statutory rates (the normal rate is reduced from 39% to 34%) and base-widening measures, so that it is supposed to be revenue neutral and the overall effective tax rate would not change much (it is supposed to be decreased for SMEs). In this way, the corporate tax system should become simpler and more transparent.

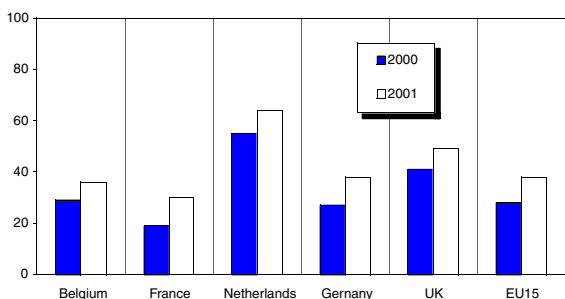
Network industries: telecommunications

Graph 23 - Mobile phone subscriptions per 100 inhabitants



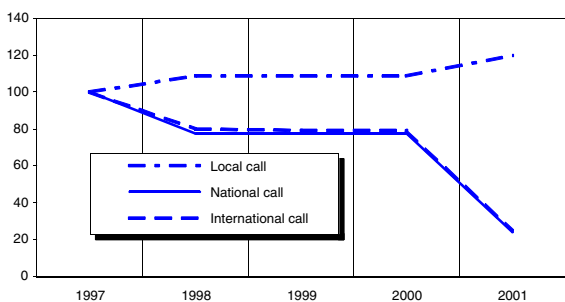
Source: IBPT, Rapport concernant l'évolution du service universel des télécommunications pendant l'année 2001

Graph 24 - Internet connections per 100 households



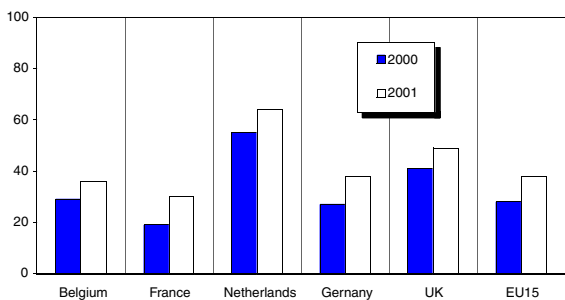
Source: IBPT, Rapport concernant l'évolution du service universel des télécommunications pendant l'année 2001

Graph 25 - Price of telephone calls in Belgium (1997=100)



Source: IBPT, Rapport concernant l'évolution du service universel des télécommunications pendant l'année 2001

Graph 26 - Local call charge per 10 min. (EUR, VAT incl.)



Source: Eurostat, NewCronos (domain Communications)

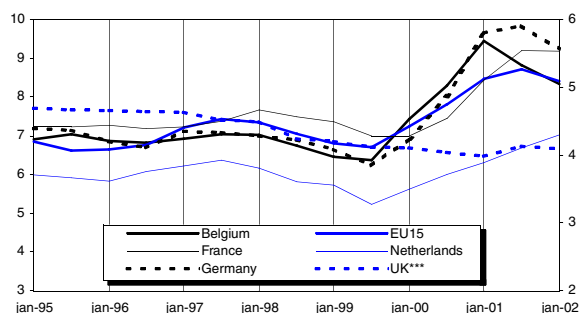
Last year was characterised by a worldwide deterioration in the climate within the telecommunications industry. Recent difficulties were caused by the conjunction of different factors: economic slowdown and declining stock exchanges in major economies, expensive UMTS licensing (auctioned) and infrastructure investments, costly mergers and acquisitions and increasing competition in the sector. As a result of this development, many operators, including some important incumbents, have announced very drastic restructuring plans in order to reduce their indebtedness. Despite this general climate, some positive results were achieved in the liberalisation of the Belgian telecommunication market. Some companies succeeded in entering the market, offering new services and lower prices. In addition to the spectacular increase in mobile telephony, broadband Internet is achieving rapid penetration. At the end of 2001 the penetration rate of mobile telephony had increased to 62% of the population as compared with 39% at the end of 2000. Between March 2001 and March 2002, the number of private broadband Internet connections tripled from 145,000 to 455,000.

At the end of 2001, Belgacom, the incumbent, was forced to publish an offer concerning the unbundling of the local loop (BRUO), which allows other operators to provide customers with direct access to their services via Belgacom access. The regulating authority (IBPT/BIPT) has made various recommendations on this BRUO, asking for a reduction in prices and improvements in technical aspects.

In September 2002, 48 operators held licenses to operate public networks, 32 held licences for voice telephony and three for mobile telephony. Despite the increased number of telecommunication services providers, Belgacom still has a dominant position in the three main markets: fixed telephony, interconnection and mobile telephony. According to the law of March 21, 1991, an operator is judged as having Significant Market Power (SMP) when it owns more than 25% of the market share. In 2002, Mobistar, the second mobile operator, was also declared to have SMP. The prices of an operator with SMP are under the control of IBPT/BIPT, which uses a cost-oriented model to determine fair prices. These controls and the increase in competition have generally allowed a decrease in prices for final users. Although prices of national and international calls on the fixed network have decreased enough to improve Belgium's position within the EU, however, (Belgium is 5th among the cheapest countries), prices of local calls increased in 2001, staying among the highest in the EU.

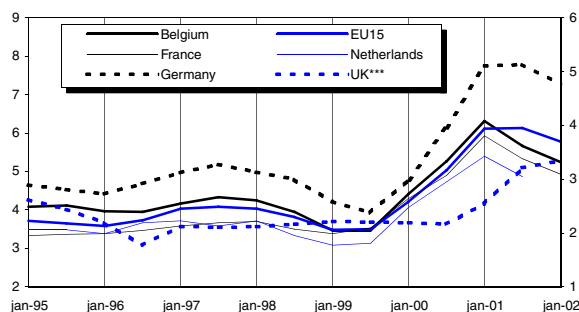
Network industries: gas and electricity

Graph 27 - Domestic gas prices in EUR/GJ, net of taxes* **



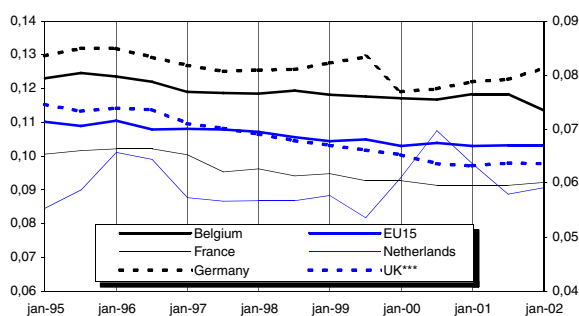
Source: Eurostat, NewCronos (domain Structural Indicators)
 (*) Standard consumer group: domestic consumer 83.7 GJ/year
 (**) Up to 1999 measured in Ecu/GJ, (***) £/GJ, right-hand scale

Graph 28 - Industrial gas prices in EUR/GJ, net of taxes* **



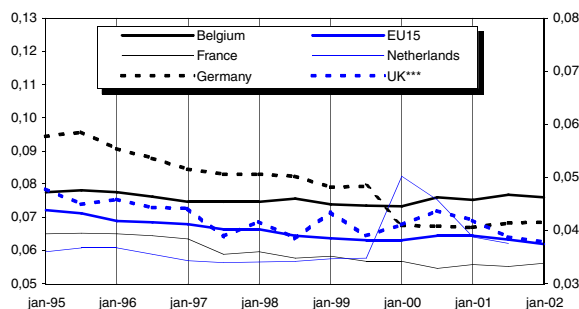
Source: Eurostat, NewCronos (domain Structural Indicators)
 (*) Standard consumer group: industrial consumer 41860 GJ/year
 (**) Up to 1999 measured in Ecu/GJ, (***) £/GJ, right-hand scale

Graph 29 - Domestic electricity prices in EUR/kWh, net of taxes* **



Source: Eurostat, NewCronos (domain Structural Indicators)
 (*) Standard consumer group: domestic consumer 3500 kWh/year
 (**) Up to 1999 measured in Ecu/kWh, (***) £/ kWh, right-hand scale

Graph 30 - Industrial electricity prices in EUR/kWh, net of taxes* **



Source: Eurostat, NewCronos (domain Structural Indicators)
 (*) Standard consumer group: industrial consumer 2 GWh/year
 (**) Up to 1999 measured in Ecu/kWh, (***) £/ kWh, right-hand scale

In view of the short period since the gas and electricity markets were opened and the differences between the degree of market opening in the member states (the four standard consumer groups as shown in the graphs are still captive except in Germany and the UK), the extent to which major differences in prices across countries can be attributed to market liberalisation is far from straightforward.

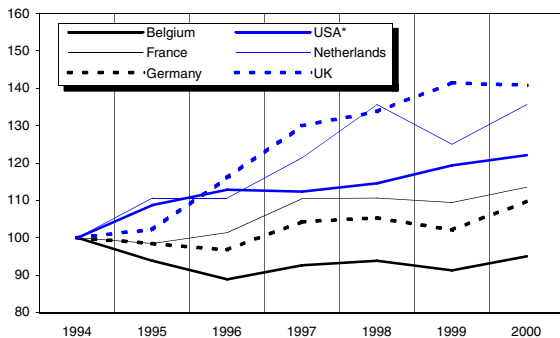
After a remarkable rise in gas prices during 1999-2000, resulting from an increase in oil prices accentuated by a high US dollar exchange rate, gas prices on the continent declined steadily until January 2002, as did oil prices. Until the beginning of 2001, gas prices for the four standard consumer groups were higher in Belgium than in all the neighbouring countries except Germany, and also higher than the EU average. During 2001, however, Belgian gas prices decreased faster than those in other countries, moving below the EU average. This trend can be traced to price reforms aimed at several gas price reductions for captive users. It is interesting to note that when taxes are included in the prices, the ranking shown in the graphs is not significantly modified.

In the case of electricity prices, the downward effect of significant price reforms over 1999-2002, combined with increased natural gas prices (natural gas is used to produce electricity) has led to a stabilisation for domestic customers in Belgium during 1999-2001 and then to a decrease that is still continuing in 2002. Despite this decline, electricity prices for households are still among the highest and above the EU average. Electricity prices with taxes included, however, put Belgium at the level of the EU average. On the other hand, electricity prices for standard industrial customers increased slightly during 1999-2001 (+2.8%), whereas they decreased in almost all other member states. As a result, electricity prices for this consumer group remain higher than in Belgium's European competitors, and the gap is widening. Belgium's position is unchanged when taxes are included.

The comparison with EU average gas and electricity prices show differences from prices in the US and Japan: for natural gas, average EU prices are close to the prices paid by US industry but about 50% higher than the prices paid by American households. They are, however, three times lower than in Japan for both categories of customers. As for electricity, the average EU prices for industry and households are about 50% higher than in the US, but from 60 to 40% lower than in Japan depending on the category of consumers.

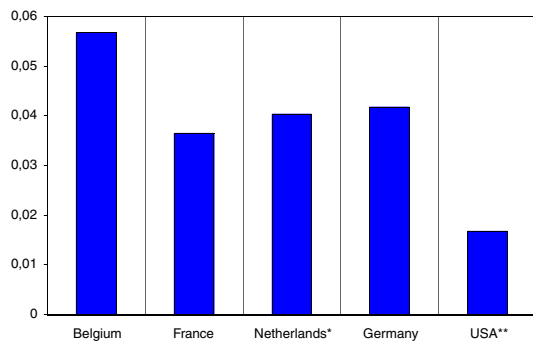
Network industries: railways

Graph 31 - Freight transport by rail (tkm, 1994=100)



Source: DG Energy and Transport & Eurostat, EU energy and transport in figures
 (*) Referring to the 10 largest operators only (91% of the market)

Graph 32 - Average turnover of railfreight (EUR/tkm, 2000)



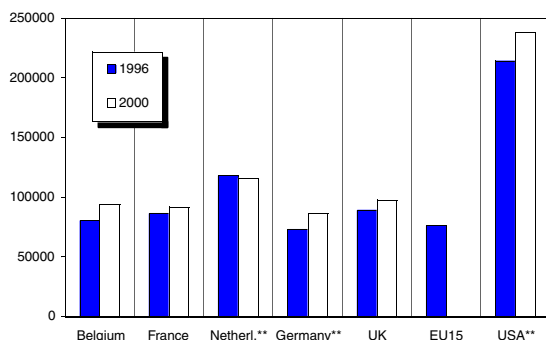
Source: FPB/BfP, own calculations based on data from UIC
 (*) Calculations based on UIC and Ministry of Transport & Water Management
 (**) Referring to the 10 largest operators only (91% of the market)

Freight traffic by rail has been more or less stable in Belgium since 1994. In France and Germany and also in the EU as a whole, it has increased slightly. Strong growth was seen, however, in the UK (41%), the Netherlands (36%) and the USA (19%). It should be noted that the UK and the USA have already opened their rail freight markets. In the growing transport market, stable traffic in Belgium implies a falling market share. Compared to other transport modes (road, inland waterways and pipelines) this share accounted for 14% in 1999 while it still accounted for 21% in 1990. In the EU as a whole the market share of railways in the goods transport market declined from 19% in 1990 to 13% in 1999.

The average turnover per tonne km is used as a very crude indicator of price levels for benchmarking. In Belgium this figure is very high in comparison to the three neighbouring countries. The incumbent (NMBS) is therefore not in a good position to fight off potential competitors. The first competitor already entered the network in April 2002. When the opening of the TERFN network to competition takes place in 2003, however, there will still be many obstacles to overcome. Some countries have problems with the allocation of capacity because of the priority given to passenger traffic, and some also have to deal with a lack of investment in infrastructure. International rail transport is still limited by the differences in technical and safety systems that exist between European countries.

Network industries: postal services

Graph 33 - Labour productivity of postal services*



Source: FPB/BfP, own calculations based on data from De Post and UPU
 (*) Average number of postal items per employee
 (**) For 2000, international items (less than 6% of total items) are estimated

The number of postal items sent and received in Belgium has increased by 10% between 1996 and 1999. In that same period, the number of employees of the incumbent (De Post) decreased. These developments illustrate improved productivity in terms of items delivered per employee. According to De Post, there was no growth in letter post traffic in 2002 and a decline of 8% is expected over the next five years. This can be explained mainly by the substitution of traditional letter post traffic by electronic mail. The forthcoming liberalisation will increase competition in Belgium since some foreign competitors are already operating on the Belgian market.

Monetary policy in the euro area

In this working paper we use the NIME model to analyse the responses of the main macroeconomic variables of the euro area under alternative monetary policy rules.

The NIME model is a macroeconometric world model developed at the Federal Planning Bureau. This model is used to study the transmission effects of economic policies and exogenous shocks on the European economy. The NIME model covers the euro area, the other countries in the European Union, the United States, Japan, and the rest of the world. In each block of countries, except the rest of the world, we distinguish between a household sector, an enterprise sector, a monetary sector and a fiscal sector. In the NIME model, money is neutral in the long run, but it is not neutral in the short run because of sluggish adjustment in prices and stocks. The two policy rules we consider in this exercise are money targeting and a Taylor rule. Under money targeting, the monetary authorities target the money supply in every period. Under a Taylor rule, the monetary authorities set the short-term interest rate by weighing inflation and output relative to a reference value.

Three shocks are applied to the model, i.e., a temporary increase in real demand, a permanent increase in the velocity of money and a permanent drop in labour productivity. The temporary real demand shock allows us to analyse the extent to which money targeting, when compared with a Taylor rule, tempers the inflationary pressures that arise in the real sector. The productivity shock and the money velocity shock allow us to examine the extent to which money targeting may compromise price stability when money growth targets are not immediately revised in the face of these shocks.

The paper begins with a brief discussion of money targeting and a Taylor rule. Under money targeting the short-term interest rate is determined by conditions in the money market, while under a Taylor rule, the short-term interest rate is determined by the conditions in the goods market. Moreover, both rules require a specific information set. Under money targeting, the monetary authorities require knowledge about potential output (growth), the velocity of money, and the contemporaneous money supply. Under a Taylor rule, the monetary authorities need knowledge about contemporaneous inflation, the output gap, and the equilibrium interest rate.

Implementing the case of a temporary demand shock is straightforward. In the case of a permanent shock to the velocity of money or productivity, however, one also has to make assumptions on how the monetary authorities revise their reference values and their targets. We therefore identify two sub-variants in the case of a permanent shock. In a first sub-variant, the monetary authorities immediately revise the reference value for output or the money target. In the other sub-variant, the monetary authorities do not change either the reference value or the money target.

In the paper, we discuss detailed simulation results for the different shocks under alternative policy rules for the euro area and we compare them with results for similar policy rules and shocks in the United States. The main conclusions are as follows. Firstly, in the case of a temporary demand shock, we find that money targeting causes the smallest deviation from trend for output during the first year. This is because the induced changes in the interest rate are larger under money targeting than under a Taylor rule in the first year. As time goes on, however, and conditions in the money market and the goods market evolve differently, we find that after the first year money targeting loses its ability to provide greater output stability than a Taylor rule. We have therefore also investigated the implications of a two-pillar strategy that sets the short-term interest rate by weighing the conditions in the money market against the conditions in the goods market. We find that such a policy rule provides greater output stability than either money targeting or a Taylor rule. It should also be noted, however, that this higher output stability is achieved at the expense of lower stability in the financial variables. Secondly, in the case of a permanent shock to the velocity of money we find that important short-run deviations from trend may occur if the monetary authorities do not immediately adjust the money supply. Third, in the case of a permanent drop in labour productivity we find that money targeting tempers the initial decline in output, especially if money targets are not revised. It should also be stressed, however, that such a loose monetary policy only delays adjustment towards the new steady state, and that it compromises price stability in the long run if money targets are not revised in good time.

“Monetary policy in the euro area. Simulations with the NIME model”, Eric Meyermans, Working Paper 11-02

Constructing productive ICT capital stock series for Belgium

In this working paper an attempt is made to construct productive capital stocks for information and communications technology (ICTs) goods in the Belgian economy over the period 1990-2000. After a presentation of the methodology and data sources and the assumptions used when building the capital stock series, we compare our results with the available data for other European countries, the US and Japan.

The widespread use of ICTs in the industrialized countries has given rise to many studies attempting to measure the impact of these technologies on economic growth and/or productivity. Most of these studies are carried out at the macro level. In this working paper we use the “perpetual inventory method” in order to construct ICT productive capital stock data for the Belgian economy as a whole and for a number of industries over the 1990-2000 period. These calculations are carried out for different sectoral classifications and will be used in a subsequent study of the impact of ICTs on the Belgian economy on the sectoral level.

The “perpetual inventory method” is based on calculating capital stocks on the basis of investment data at constant prices. Since the only year for which data on nominal ICT investment exists is 1995, we use foreign trade data to construct ICT investment expenditure by Belgian enterprises. The 1995 data mentioned above were used to calculate these investment series at the sector level.

After the calculation of ICT investment data at current prices, at both macro and sectoral levels, appropriate investment deflators have to be used in order to convert these into constant price investment series. Since ICT goods are subject to frequent changes in quality, harmonized price indexes, based on the US hedonic price indices, are used for deflation, rather than available investment deflators, which do not take into account improvements in a number of characteristics of computers.

Once ICT investment at constant prices has been calculated, assumptions must be made in relation to certain parameters of the capital accumulation process in order to construct productive capital stocks for each ICT asset (two items are considered in our calculations: information technology hardware and communications equipment). These assumptions relate to the average service life of each ICT asset, their age-efficiency profile and their use on retirement. The average service life is set at 5 years for IT equipment and 11 years for communications equipment. A hyperbolic age-efficiency profile is used in order to take into account losses occurring in the productive capacities of ICT capital goods. A deterministic mortality function characterized by the simultaneous exit of capital goods of the same generation has been used for the retirement process.

After the calculation of the user cost of each ICT capital asset, which was needed to obtain each asset’s share of total income, the rate of depreciation has been calculated on the basis of the age-price profile – itself derived directly from the age-efficiency profile – and the internal rate of return on each asset is calculated as the ex-post rate that uses up all non-labour income in the production account.

In the last section, we first examine the evolution of the share of ICT investment and capital respectively in total nominal investment and capital stock of six major sectors of the Belgian economy over the 1990-2000 period.

The share of ICT investment in total investment and the share of ICT capital in total capital stock are presented for several European countries, the US and Japan during the nineties. We also compare the share of ICT investment in equipment investment for the manufacturing and services sectors in France and Belgium in the nineties. These comparisons enable us to assess the extent of ICT diffusion in Belgium over the period 1990-2000.

“Constructing productive ICT capital stock series for Belgium”, T. Pamukçu, W. Van Zandweghe, November 2002, Working Paper 12-02.

Qualifications and ICT: the role of education and training

This study reviews the increasing wage and employment differentials between less skilled and highly skilled workers in Belgium and most developed countries. This development is related to the increasing use of technology in the production process. Educational strategies for improving ICT experience among children and less skilled adults are also investigated.

The paradox and its explanation

In most developed countries, and Belgium is no exception, rapid increases in the supply of skilled labour has made less skilled labour increasingly scarce. At first glance it seems paradoxical that this development has been accompanied by a deterioration in labour market outcomes for less skilled workers. This development can, however, be explained by a strong relative increase in the demand for skilled workers, an increase that has outweighed the initial increase in the supply. There are two possible explanations for this increase in the demand for skilled labour. The first hypothesis is that increased exposure to trade from developing countries has caused developed countries to specialize in the production of skill-intensive goods and services. The second hypothesis is that skill-biased technological change (hereafter SBTC) has caused production in both developed and developing countries to become more skill-intensive, although this development may differ in magnitude. We find support from the literature for the latter hypothesis, i.e. we conclude that SBTC is the root cause of the observed increase in wage and employment differentials.

Skill-biased technical change and less skilled workers

The basic causal link is that SBTC has caused a deterioration in the relative position of less skilled individuals on the labour market. Empirical support for this line of reasoning is presented and discussed. There are, however, grounds to believe that alternative lines of reasoning might also be true. For example, an exogenous increase in the level of skills in the population may have resulted in SBTC, thereby increasing the demand for skills. The main difference between this and the first causal link is that SBTC is no longer an exogenous causative factor, but is the result of a exogenous change in the level of skills in the population. Another alternative is that the basic causal link should be reversed, i.e. that the increased cost of skilled workers has (further) encouraged employers to invest in SBTC. Lastly, some studies suggest that those benefiting from the introduction of ICT in the workplace are not IT specialists, but those with skills complementary to IT, such as managers, designers etc.

ICT and learning

The second part of the study investigates educational strategies for improving experience of ICT among children and less qualified adults. It begins by outlining the advantages of learning in general and of ICT skills in particular. The OECD summarizes this by postulating that “learning for such competence and confidence needs a prominent place in combating social exclusion” (OECD, 1999, 23). Next, four basic approaches to integrating technology into learning and instruction are brought forward and the characteristics of (less skilled) adults and children in a learning environment are then outlined. In view of these characteristics it is considered which of the educational strategies is optimal in order to improve ICT skills among the categories of learners identified.

The first conclusion is that including ICT directly in the curriculum, i.e. giving ICT courses, is not most appropriate for those adults who lack basic skills. First of all, these individuals lack the skills that are needed to deal with ICT, so it would be better to work on these skills first. Secondly, these individuals more often than not have little experience of ICT, a deficiency that is known to result in a more negative attitude towards ICT. It would therefore be more effective to introduce ICT indirectly in a curriculum aiming to improve the basic skills of these adult learners. This way, they could improve their basic skills and gain experience with ICT in the process.

It is clear that this first conclusion does not hold true for adult learners who do not lack basic skills. In fact, ICT courses could be highly effective, and this may be the reason why there is a need for these courses among both employed and unemployed adults. This is the second conclusion.

Finally, the above-mentioned educational strategies are considered in relation to learning by children. The goal may either be to improve the average level of ICT skills among pupils or to minimize differences between pupils in terms of their ICT skills. A review of the literature unfortunately shows that this latter objective is too ambitious. It also cannot be concluded that having access to ICT improves the general skills of pupils, if the introduction of ICT is not accompanied by a re-examination of the curriculum as a whole. This is the third conclusion.

“Opleiding en kwalificaties, arbeidsmarkt en ICT: de rol van onderwijs en training”, G. Dekkers, Working Paper 15-02.

Other Recent Publications

[Economic Forecasts 2003](#), September 2002,
(available in Dutch and in French).

[Medium Term Economic Outlook 2002 - 2007](#), April 2002,
(available in Dutch and in French).

[AIECE General Report](#), October 2002.

Prepared by the FPB for the AIECE (Association des Instituts Européens de Conjoncture Economique).

[Planning Paper 91](#), March 2002

"Perspectives financières de la sécurité sociale 2000-2050: Le vieillissement et la viabilité du système légal des pensions / Verkenning van de financiële evolutie van de sociale zekerheid 2000-2050. De vergrijzing en de leefbaarheid van het wettelijk pensioensysteem", M. Englert, N. Fasquelle, M.-J. Fesjtjens, M. Lambrecht, M. Saintrain, C. Streel, S. Weemaes.

[Working Paper 07-02](#), July 2002., "ICT contribution to economic performance in Belgium: preliminary evidence", Ch. Kegels, M. Van Overbeke, W. Van Zandweghe

[Working Paper 08-02](#), September 2002, "ICT contribution to economic performance in Belgium: preliminary evidence - A revision of WP 7-02", Ch. Kegels, M. Van Overbeke, W. Van Zandweghe.

[Working Paper 09-02](#), September 2002, "Agglomération et dynamique des activités économiques dans les villes belges : Une approche spatiale et sectorielle", J. Decrop.

[Working Paper 10-02](#), September 2002, "Towards E-Gov in Belgium - Situation in August 2002", H. Van Sebreeck.

Research in progress

[The MODTRIM II model](#)

The 'Short term forecasts and business cycle analysis' team built a quarterly model for the Belgian economy during the period 2000-2001. Despite its newness, this model has already been re-estimated a couple of times due to several revisions of (quarterly) national accounts. The model was used during the last four forecasting rounds and its quarterly results were presented graphically in the Economic Budget. A new version of the model is being estimated and its simulation properties will be published.

contact: il@plan.be

[Labour market analyses](#)

Three areas are currently being investigated in the field of labour market analysis: 1. the impact of labour turnover on the evolution of wages, 2. the impact of three special employment programmes aimed at specific groups, 3. the development of a macro-econometric model of a segmented labour market including wage setting, labour supply and demand, and matching.

contact: cj@plan.be, mln@plan.be

[The NEMESIS model](#)

In collaboration with a network of European research institutions, the FPB is developing a regional macro-sectoral econometric model for Europe, whose baseline should be available soon. This aims at providing tools for decision-making in the fields of energy, the environment and economic policy.

contact: fb@plan.be

[Impact of ICT in Belgium.](#)

As a follow-up of its study on ICT diffusion in the Belgian economy, the FPB studies the effects of ICT on the Belgian economy. This project has six components: macro-economic impact, micro-economic impact, digital divide and dualisation, ICT and the localisation of economic activities, e-government, and Internet and indirect taxation.

contact: ck@plan.be, gd@plan.be

[Cities and regions](#)

The aim of the research is to get an insight in the specialisation and dynamism of cities and regions in Belgium. Structural changes in the sectoral composition of the Belgian economy is taken into account. On a regional level, the Belgian regions are compared with some other major European regions. On a city and town level, a study on the factors determining the location of economic activities and the location of households is undertaken.

contact: ds@plan.be

[Input-Output](#)

The Federal Planning Bureau prepares Input-Output tables for 1995. These will be compiled for the first time using the Economic System of Accounts ESA95. The Institute for National Accounts will transmit the data to Eurostat. In the beginning of 2003, Eurostat should dispose of comparable IO-tables for 1995 for all EU-countries in a 60 commodity disaggregation.

contact: ag@plan.be

Recent history of major economic policy measures

- November 2002** The federal government approves the new stability programme for Belgium (for the period 2003-2005). Budgetary equilibrium should be reached in 2002 and 2003. For the medium term, the government proposes to pursue a general government account surplus of 0.5% of GDP in 2005.
- November 2002** The federal government decided to take over the debts of the national railway company NMBS / SNCB, albeit subject to certain conditions. These are that the total government debt has fallen below 100% of GDP, and the operation has a neutral impact on the budget. Due to major infrastructure investments in recent years, the railway company's debts had become very considerable.
- October 2002** Acknowledging the sharp deterioration in the public finances in major EU countries (Germany, France, Italy and Portugal), the European authorities suggested delaying from 2004 (as set out in the Broad Economic Guidelines 2002) to 2006 the deadline for reaching balanced budgets in euro-zone countries, and stress the need for those countries in deficit to pursue continuous adjustment of their structural deficits by at least 0.5% of GDP per year. The Commission launched an Excessive Deficit Procedure against Portugal and Germany and addressed an early warning to France.
- October 2002** The Belgian federal government presented a balanced budget in 2003 for general government, assuming lower economic growth (2.1%) than forecast by the Institute for National Accounts (2.6%).
The various reforms concerning direct taxation were confirmed (the 2003 stage of the personal income tax reform, the abolition of the "complementary crisis contribution" and the reform of corporate income tax). Indirect taxation on tobacco products is increased and personal advance payments were introduced to take better account of the local government surcharge (these two measures account for nearly 0.5 billion euro, but the budgetary impact of the second one is a one-shot).
Other one-shot revenues have been decided (dividends from Belgacom, selling of buildings etc..) amounting to almost 0.5 billion euro.
A further reduction in employee social security contributions for low wage earners has been announced, by either expanding the low-wage ceiling or increasing the exemption per worker (amounting to 70 million euro). Seasonal work in agriculture and the restaurant and hotel business will be subjected to lower employer social security contributions. The details of these two measures will be determined before the end of 2002.
A simplification of the various schemes of employer social security contributions' reductions will be adopted by law before the end of this year. The recommendation from the social partners that had been requested by the government, was given in October.
The government decided to limit to 1.2% the pace of real-terms growth in primary expenditure at the federal level, through various measures.
Social expenditure was increased through various measures. Some low retirement benefits were increased, notably minimum pension allowances (a 3.8% for wage-earners and 5% for self-employed people), pensions for wage-earners and self-employed people who retired in 1994 and 1995 (by 2%) and pensions for self-employed people who have taken early retirement. Family allowances will be increased for severely ill and handicapped small children. Spending on health care insurance will grow faster (6.5%) than the "norm", allowing for various measures: increased subsidisation of surgical operations, hospitals and some medicines, increased intervention for severely ill and handicapped children, wage increases for "family" practitioners, increased budget for institutionalised long-term care.
- October 2002** The federal budget also includes a 300 million euro increase in capital for the postal company De Post / La Poste. This sum will come from the Federal Participation Company, and had already been reserved for De Post for a few years. It will be used for modernisation of the company.
- September 2002** The government nominated "ELIA System Operator" as transport system operator for electricity. This nomination was a key step in the opening up of the Belgian electricity market.
The regulator of the electricity and gas markets in Belgium (CREG) approved the Fluxys' tariffs for connection to and use of the gas transport network. The tariffs are applicable as of 1 November 2002. These tariffs are the first regulated tariffs according to the Belgian legislation on the organization of the gas market.
- July 2002** A new management contract was concluded between the Federal Government and the postal company De Post / La Poste. The contract covers the 2002-2006 period and specifies public service obligations, among other things. It also determines the financial compensation paid by the State for these obligations.

A more complete overview of "Recent history of major economic policy measures" is available on the FPB web site (<http://www.plan.be>)

Abbreviations for names of institutions used in this publication

BIPT/IBPT	Belgian Institute for Postal services and Telecommunications
BLEU	Belgian-Luxembourg Economic Union
EPO	European Patent Office
NBB/BNB	National Bank of Belgium
UIC	International Union of Railways (French abbrev.)
UPU	Universal Postal Union
USPTO	United States Patent Office
WTO	World Trade Organisation

Glossary / Other Abbreviations

Effective corporate tax rate	Ratio of corporate tax paid on gross operating surplus
FDI	Foreign Direct Investment: investments in domestic assets and equity by foreign economic agents, and foreign assets and equity by domestic agents
GJ	Billion joule: measure of the energy content of gas
GWh	Million kWh
ICT	Information and Communication Technologies
ISCED	International Standard Classification of Education
MHT	Medium and high-technology sectors: chemicals, chemical products, all machinery and equipment, post & telecommunications, computer services, research & development (NACE 24, 29-35, 64, 72 and 73)
Openness	Ratio of imports and exports to GDP
PPP	Purchasing Power Parity: currency conversion rates that convert economic indicators expressed in national currencies to a common currency that equalises the purchasing power of different national currencies
Public procurement	Purchases of consumption and investment goods (and services) by public authorities, <i>i.e.</i> works, supplies and services
SITC	Standard International Trade Classification
State aid	Transfer of State resources to private and public enterprises
Statutory corporate tax rate	Official tax rate on profits
TERFN	Trans European Rail Freight Network: network of major lines to be opened for competition in 2003
Tkm	Tonne kilometer: Measure for the physical output of goods transport
Venture capital	Capital that provides long-term, committed, risk sharing equity to help unquoted companies to grow and compete.
Effective corporate tax rate	Ratio of corporate tax paid on gross operating surplus