The transmission of monetary policy impulses in Belgium

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Belgium's participation in European monetary union brings it the microeconomic benefits of a large commercial and financial area without any currency risk, and the macroeconomic advantages secured by an independent central bank which has been given a clear mandate to maintain price stability. Any cost incurred in renouncing an autonomous monetary policy – which had been to some extent anticipated by the adoption of a target exchange rate geared to the German mark in 1990 – depends not only on the probability that the Belgian economy may face specific shocks, but also on the extent to which the reaction to the impulses of the single monetary policy is liable to be atypical.

In order to supply some tentative answers to this last question, the present article first outlines the process whereby monetary policy impulses are transmitted, here and there pinpointing special features of the Belgian economy. After that it presents the results of some macroeconomic simulations.

1. Complexity of the transmission of monetary policy impulses

1.1 From the instrument to the objective : a long road

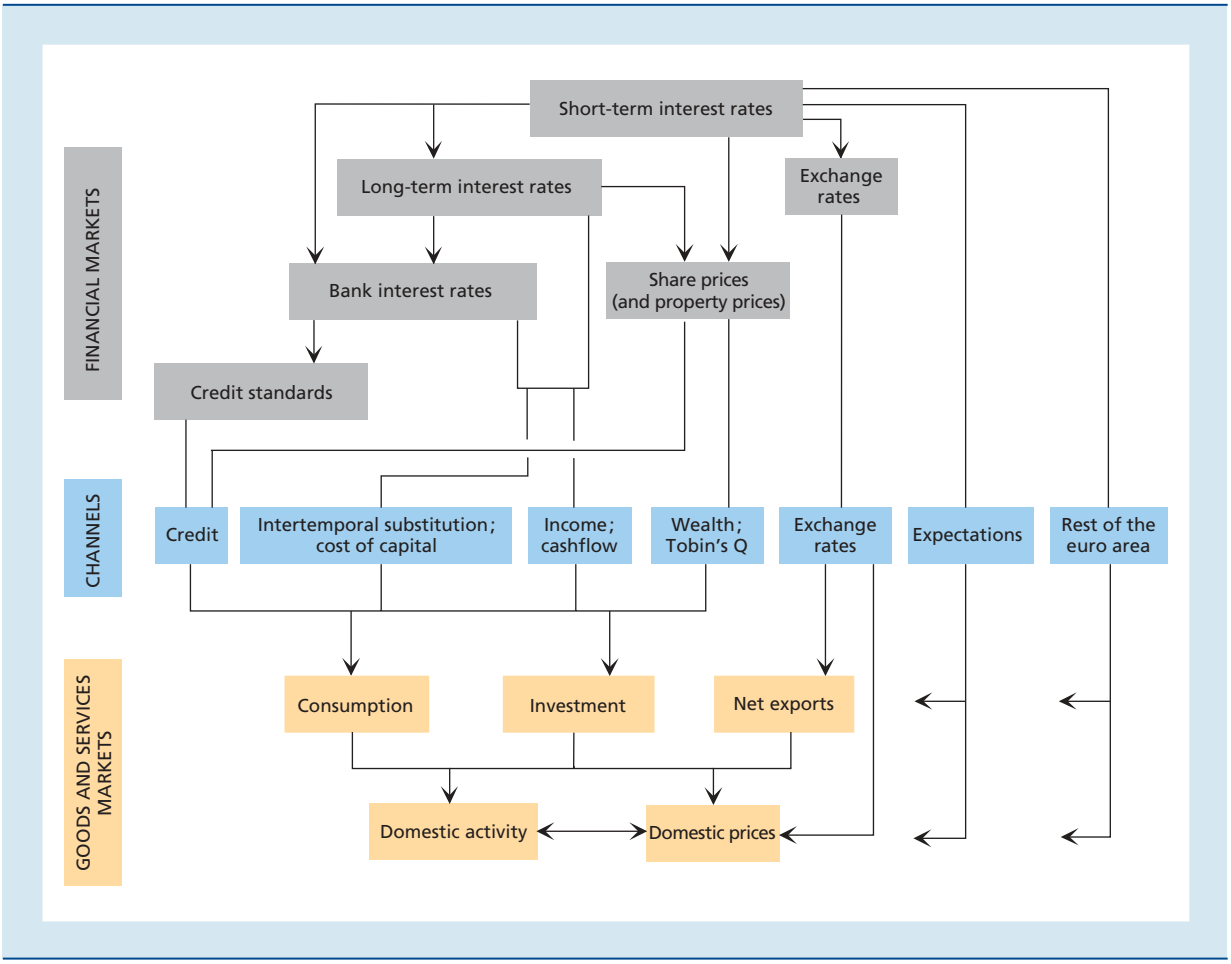
The effects of monetary policy on activity and prices cannot be analysed without reference to different time horizons. Thus, it is by maintaining price stability in the medium and long term that the monetary authorities will create the most favourable environment for sustainable growth. In that respect, the mandate conferred on the Eurosystem and the disappearance of the currency risk within the euro area give Belgian economic agents the assurance of monetary stability in a huge economic area.

In the shorter term, the monetary authorities contribute to the stabilisation of growth, since they take account of the fact that cyclical fluctuations will generate upward or downward pressure on prices. The desire to stabilise activity also explains why the price stability objective is defined in the medium term, permitting a gradual response to certain shocks affecting prices. However, it cannot give way to a desire to stimulate activity to the detriment of price stability, which would rekindle inflationary expectations.

The central bank tries to attain its objectives by responding to the various shocks affecting the economy. Thus, demand may be boosted by "financial exuberance", strong wage increases, a lax fiscal policy, or strong foreign expansion, etc. If such shocks give rise to inflationary pressure, the central bank may feel obliged to put the brakes on economic expansion in order to preserve an environment conducive to longer-term growth. Conversely, supply may be augmented by increased productivity gains. In that case, it may be necessary to ease monetary policy in order to encourage the adjustment of demand. A rise in oil prices is a more awkward shock, depressing activity and pushing up prices. The central bank will have to make sure that such a shock does not trigger any inflationary drift.

(1) The authors would like to thank K. Burggraeve and Ph. Jeanfils for the macroeconomic simulations which they carried out, and for their comments.

CHART 1 MAIN CHANNELS FOR THE TRANSMISSION OF MONETARY POLICY IMPULSES (1)



(1) This diagram simplifies all the interactions between the different variables presented, in order to show only the main channels through which a monetary policy impulse travels before affecting the goods and services markets.

Since the Belgian economy is closely interwoven with that of Europe, the movements are similar to those occurring in the euro area. In recent decades, it has been little affected by "asymmetric shocks" and has produced hardly any asymmetric response to common shocks. Together with France, Germany, the Netherlands and Austria, Belgium is one of the countries where developments in activity and prices were closest to the average for the euro area during the period 1993-2000. (1)

Monetary policy impulses are specific shocks (or counter-shocks) which have only an indirect effect on activity and prices. The central bank only exerts direct control over very short-term interest rates on the money market. These influence other financial variables which in turn affect behaviours on the goods and services markets and on the labour market, where costs and prices are determined (chart 1). Throughout this transmission process, the expectations of economic agents – financial market participants and parties involved in setting wages and prices, in particular – play an essential role.

1.2 The influence exerted on the financial variables

The anticipations of economic agents come into play right in the initial stages of the transmission of monetary policy impulses, as the same increase in the very short-term interest rate has very different effects on the yield curve depending on how it is perceived. If it was anticipated, it has hardly any impact on longer-term rates. If unexpected and regarded as long-lasting, e.g. because it augurs better growth prospects, it may push the whole curve upwards. Conversely, if it reinforces the anti-inflationary credibility of the central bank it may cause long-term rates to fall.

(1) Cf. S. Ide and Ph. Moës (2003).

Moreover, long-term interest rates in the euro area do not depend solely on the monetary policy of the Eurosystem and its future expected stance, but may also be influenced by other factors. Thus, they are directly affected by long-term rates in the United States, a phenomenon which became abundantly clear at the time of the abrupt rise in global bond market rates in 1994.

Where exchange rates are concerned, the multiplicity of factors taken into account in forming anticipations is such that the normal reaction to a short-term interest rate hike – namely (assuming that foreign interest rates remain steady) the appreciation of the currency in which investments have become more lucrative – does not always occur. That is why it is important, in any empirical exercise assessing the effects of monetary policy, to be able to identify the exchange rate channel.

Money and bond market interest rates in turn determine the rates applied by banks on loans and deposits. A forthcoming article will be devoted to the setting of bank rates in Belgium. Changes in the monetary policy stance may also affect the other bank lending criteria. Thus, a rise in interest rates which, all other things being equal, could cause a deterioration in the financial position of borrowers, may induce banks to ration credit in so far as they fear that higher rates may lead them to be presented with projects which are too risky (adverse selection).

Once monetary policy has been tightened, the slackening pace of lending and the increased attraction of investments in securities curb the expansion of the money stock.

Finally, a rise in interest rates normally causes a fall in the price of assets, constituting the discounted value of future income, such as the prices of existing equities and bonds, and property prices.

1.3 Channels through which financial variables influence real variables

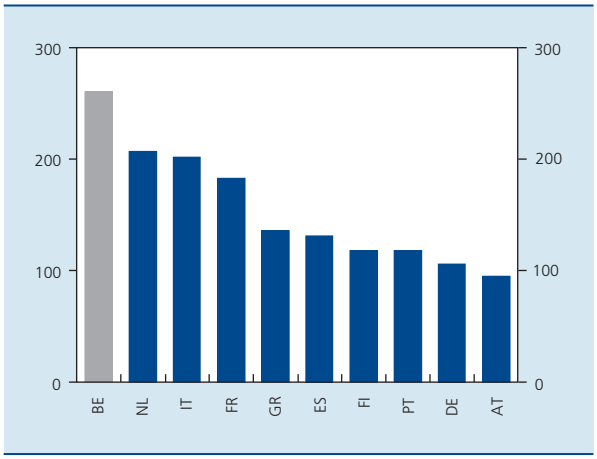
If the central bank raises interest rates,[1] that is likely to affect the variables in the 'real' economy through various channels. The most traditional one is that of inter-temporal choices: economic agents are encouraged to substitute financial assets – which have become more remunerative – for real assets, or to contract fewer debts, and thus to defer their consumption and investment expenditure. In general, we refer to the substitution channel in the case of consumers and the capital cost channel in the case of businesses. These effects have their greatest impact on expenditure on consumer durables, property, equipment and stocks, because those types of expenditure can more easily be postponed.

Furthermore, higher interest rates mean higher interest charges for borrowers and more income for lenders. These income effects are felt sooner if existing loans are short-term. In this connection, it appears that in Belgium, as in the majority of euro area countries, medium- and long-term borrowing predominates, especially where mortgage loans are concerned.[2] Demand for goods and services will be affected in so far as the propensity to spend current income varies between borrowers and lenders. Overall, the income effect will be positive for households in general and negative for businesses, where cash flow becomes tighter (see below), and for public authorities.

On the other hand, the fall in asset values caused by an increase in interest rates exerts a negative wealth effect on household consumption, provided it is seen as relatively permanent. The scale of the wealth effects depends on many factors. In Belgium, as in most euro area countries, it appears to be relatively limited, especially in comparison with the United States.[3] However, it may have increased, given the spread of shareholding, especially via undertakings for collective investment.

CHART 2 NET FINANCIAL ASSETS OF HOUSEHOLDS IN THE EURO AREA COUNTRIES[1]

(End of 2000, percentages of GDP)



Source: Report on Financial Structures, ECB, 2002.
(1) Data for Ireland and Luxembourg are not available.

(1) The effects of a decrease in interest rates may be considered symmetrical.
(2) In regard to the housing market, see V. Baugnet, D. Cornille and M. Druant (2003).
(3) Cf. B. Eugène, Ph. Jeanfils and B. Robert (2003).

It is true that Belgium is notable for the level of households' net financial wealth, which is partly the corollary to the level of the public debt (chart 2). However, those assets include a large proportion of unlisted shares, which are perhaps recorded more comprehensively than in other countries, and the difference in relation to the euro area average as regards the scale of the public debt is tending to diminish.

The fall in share prices caused by a tightening of monetary policy is also liable to curb investment, since it is a disincentive to issue shares. The ratio between the stock market capitalisation and the replacement value of the capital stock, known as Tobin's Q, influences the choice between the acquisition of existing companies and investment. Once again, this effect is probably less pronounced in the euro area than in the United States.

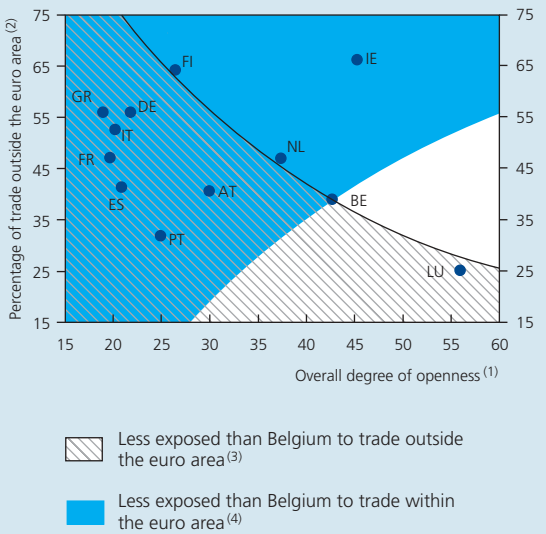
The negative effects of an interest rate increase on domestic demand may be reinforced by the existence of a credit channel, owing to the imperfection of the financial markets with their information asymmetry. A tighter monetary policy may in fact lead not only to a rise in the general level of interest rates but also to an increase in the external financing premium, or even credit rationing, since it is likely to aggravate the information asymmetry problem. On the one hand, the least liquid and solvent banks will be unable to compensate for the erosion of deposits by issuing securities, and will be more restrictive in their attitude to lending (bank lending channel). On the other hand, the deterioration in the balance sheet position of firms and the decline in the value of the collateral that borrowers can present will make the banks more cautious (balance sheet channel). Thus, we can observe financial accelerator mechanisms.

The existence of a cashflow effect on business investment is often regarded as evidence of the existence of a balance sheet channel, since it indicates cash constraints. An analysis conducted on a large sample of Belgian companies recently showed that such an effect was actually perceptible in manufacturing industry and in the building sector, especially in highly capital-intensive branches and in small firms. (1)

However, at the macroeconomic level it is apparent that Belgian companies have relatively low dependence on credit granted by resident banks. This situation is due in part to greater use of financing via foreign associate companies.

(1) Cf. P. Butzen, C. Fuss and Ph. Vermeulen (2001).

CHART 3 DEGREE OF OPENNESS OF EURO AREA ECONOMIES



Sources: EC, NAI.

(1) Average of exports and imports of goods and services as a percentage of final demand.

(2) Average of exports and imports of goods outside the euro area as a percentage of the average of total exports and imports of goods.

(3) Area in which the overall degree of openness times the percentage of foreign trade outside the euro area is less than the figure for Belgium.

(4) Area in which the overall degree of openness times the percentage of foreign trade within the euro area is less than the figure for Belgium.

In contrast to the other channels, the exchange rate channel has a direct impact on domestic prices: a currency appreciation reduces the cost of imports, and that is reflected with varying degrees of rapidity in consumer prices. Moreover, the appreciation depresses demand for products of firms in the exposed sector, whose competitive position deteriorates, so that it causes a fall in net exports. This effect is attenuated by the increase in the purchasing power of households, stimulating their consumption.

Adoption of the euro brought about a profound change in the exchange rate channel, since it is only exchange rates in relation to currencies outside the euro area that now vary. Previously, it was quite common for sharp fluctuations in the latter to cause tension between currencies of the European exchange rate mechanism, particularly if the dollar was weak. Moreover, exchange rate adjustments resulting from realignments within that mechanism were probably perceived as more permanent than fluctuations in the exchange rates of floating currencies. The exchange rate channel has therefore lost some importance. However, as a percentage of final demand, trade with countries outside the euro area is more important for Belgium than for the majority of euro area countries: in that respect,

Belgium comes next after Ireland, along with Finland, the Netherlands and Luxembourg (see chart 3). That position is due in particular to a greater preponderance of imports of intermediate products, and may be influenced by a "port effect".

Furthermore, the tightening of monetary policy is necessarily common to all euro area countries, and its effects on the Belgian economy depend very much on its impact on Belgium's trading partners within the euro area. Such spill-over effects will be particularly substantial for the Belgian economy which, after the Luxembourg economy, is the most open to trade with the rest of the euro area (chart 3).

The description of the channels for transmitting monetary policy impulses outlined above is not exhaustive. Thus, the increase in the interest burden for businesses pushes up costs and that usually reduces supply. The interaction between overall supply and demand for goods and services and the reactions on the labour market determine the scale and profile of the price and volume effects, a process in which expectations also play a key role.

1.4 Price and volume effects

All other things being equal, a rise in interest rates causes a contraction in overall demand which exceeds the reduction in supply, thus pushing prices down. As we have seen, prices may also be affected more directly by a currency appreciation on the foreign exchange market.

The distribution of the effects of the downward shift in demand on activity and prices respectively depends in particular on the price and wage setting, especially the degree of rigidity and the influence of anticipations. In this regard, one special feature in the case of Belgium is the automatic wage indexation, which reduces the nominal rigidity of wages and increases their real rigidity. However, the indexation is tempered by reference to a "health index", which excludes the prices of fuel, alcoholic beverages and tobacco, while wage bargaining makes explicit allowance for the need to maintain competitiveness.

Generally speaking, nominal downward rigidities or the persistence of inflationary expectations imply that a tighter monetary policy will cause a relatively large contraction in activity before producing the expected effect on prices, via under-utilisation of production capacity and the labour force. In an inflationary context, some growth has to be "sacrificed" in order to restore price stability. On the other hand, if the interest rate hike restores the anti-inflationary credibility of the central bank, the effect on prices may be far more rapid. If the central bank enjoys good credibility, it is easier to ensure price stability, and monetary policy can make a more effective contribution towards stabilising growth.

2. A simulation exercise

2.1 Limits of the exercise

The great complexity of the monetary policy transmission process, where the effects depend in particular on the state of the economy and the degree of credibility of the central bank, makes it very difficult to quantify the effects of monetary policy on activity and prices. The results of estimates produced via vector autoregressive (VAR) models or structural models are therefore rather uncertain orders of magnitude. They proceed from an inevitable simplification of the multiple economic interactions, and are therefore sensitive to the modelling choices. Moreover, they are necessarily based on regular effects observed in the past, in this case a past which may be different from the current situation, since the introduction of the single currency represented a major structural change.

The studies carried out by the Eurosystem in 2001, the main results of which were summarised in the ECB's Monthly Bulletin of October 2002 [1], showed that multiple models converged to produce the same picture : a temporary interest rate increase controlled by the central bank causes a transient contraction in activity and a slower but more persistent fall in prices. However, the models differ in terms of the scale and above all the time profile of these effects.

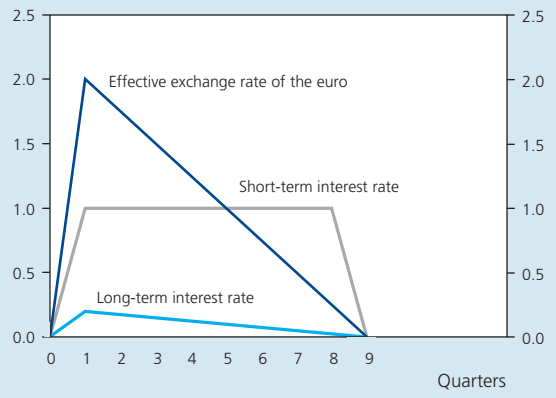
The estimates presented below constitute an update of some of the simulations carried out at that time. For the euro area, they are based on the NiGEM multi-country structural model developed by the National Institute for Economic and Social Research (NIESR) in the United Kingdom. The results of this model are the international environment variables used in the simulation relating to the Belgian economy, based on the Bank's quarterly structural model, which has been updated. [2]

(1) For a broader account, see I. Angeloni, A. Kashyap and B. Mojon (2003).

(2) The model published in 2000 – cf. Ph. Jeanfils (2000) – was re-estimated over a longer period, using new national accounts data (ESA 95) ; the consumption function – cf. B. Eugène, Ph. Jeanfils and B. Robert (2003) – and the investment function, among other things, were reformulated.

CHART 4 INTEREST RATE AND EXCHANGE RATE ASSUMPTIONS

(Percentage deviations from the base level)



2.2 The assumptions

The monetary shock considered is a 100 basis points increase in the key rate over a two-year period, followed by a return to the level of the base scenario. Among the financial variables forming a link for the transmission of monetary policy impulses, two are of crucial importance: long-term interest rates and foreign exchange rates. In the simulation exercise, the duration of the shock (two years) is taken as known. According to the uncovered interest rate parity assumption, the 1 percentage point rise in the short-term interest rate causes an immediate 2 p.c. appreciation in the nominal effective exchange rate, followed by a steady depreciation over two years, back to its original level, so that this depreciation offsets the short-term interest rate differential in relation to the rest of the world. Moreover, on the basis of the expectations assumption, this same rise in short-term interest rates implies an immediate 0.2 p.c. increase in the 10-year bond rate, followed by a steady decline over two years, so that the yield on a 10-year investment remains equivalent to that on successive short-term investments.

The effect of an interest rate increase with no change in exchange rates will also be examined, in order to take account of the particularly uncertain character of the reaction of the foreign exchange markets, and to highlight the specific features of the exchange rate channel.

2.3 Effects on activity and prices in the euro area

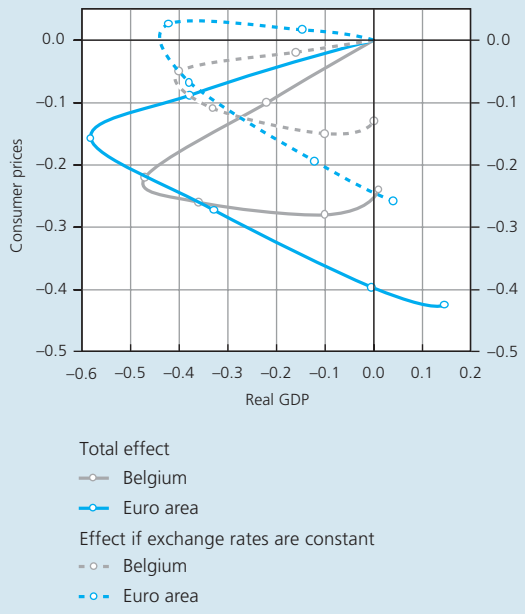
The simulations effected by means of the NiGEM model for the euro area confirm the general conclusion of earlier studies, namely that – all other things being equal – tightening of monetary policy causes a temporary contraction in activity and a slower but more sustained fall in prices.

If exchange rates are held steady, it is only activity that reacts to the interest rate hike in the first two years of the simulation. The absence of any immediate fall in prices, or even the presence of a slight rise, may be due to price rigidity, the impact of the increase in the cost of capital on supply, and the rise in unit labour costs resulting from a slow reaction by employment and wages to the contraction in activity. Prices subsequently fall, owing to the lower rate of utilisation of the economy's productive capacity, and this movement persists well after the end of the monetary shock, whereas activity returns to the base level.

If exchange rates react to the interest rate increase, that amplifies the temporary contraction in activity, but above all it leads to a faster and more pronounced fall in prices. Even before it influences the level of production, an exchange rate adjustment in fact has a direct impact

CHART 5 EFFECTS OF THE MONETARY POLICY TIGHTENING ON REAL GDP AND CONSUMER PRICES

(Percentage deviations from the base level over the first five years; each point represents one year)



Source : NBB.

on prices. The fall in import costs is to some extent very promptly reflected in consumer prices – in the case of imports of petroleum products or consumer goods – and to some extent more slowly – in the case of capital goods and intermediate products, where the decline in prices has a positive effect on supply. Despite these price responses which vary in speed, the appreciation of the euro depresses activity in so far as the impact of the loss of competitiveness outweighs that of the improvement in domestic purchasing power.

2.4 Effects on activity and prices in Belgium

The effects of a monetary policy tightening on activity and prices in Belgium do not appear to be noticeably different from those estimated for the euro area. According to the Bank's model, the temporary contraction in activity appears to be slightly weaker, and the fall in prices is faster, irrespective of whether the exchange rate channel is taken into account.

Subject to the points of uncertainty mentioned above, particularly the differences in modelling, it therefore seems that a number of the specific features of the Belgian economy mentioned in the first part of this article, such as the high level of net household wealth or the high degree of openness to countries outside the euro area, have no evident impact on the macroeconomic consequences of a monetary policy tightening. On the other hand, wage indexation – which is a handicap in other circumstances – may contribute to the faster spread of price reductions, particularly following the appreciation of the euro[(1)], and may thus improve the "sacrifice ratio", i.e. reduce the scale of the decline in activity necessary to curb inflation. Conversely, wage indexation reduces the expansionary effect of any easing of monetary policy.

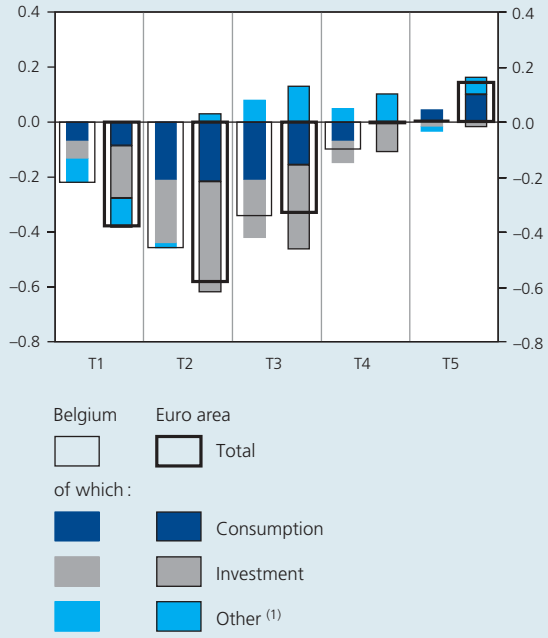
As regards the degree of openness of the Belgian economy to the rest of the euro area, this plays an important role, since a large part of the effects of monetary policy is due to its impact on the economies of the partner countries.

2.5 Effects on the main components of demand

Examination of the impact of a monetary policy tightening – including via the exchange rate channel – on the main components of expenditure at constant prices in the euro area, estimated by means of the NiGEM model, reveals the high sensitivity of investment. The contraction in investment owing to an accelerator effect – albeit delayed by the adjustment lags – makes a greater contribution towards

CHART 6 EFFECT OF THE MONETARY POLICY TIGHTENING ON REAL GDP AND ITS MAIN COMPONENTS

(Contributions to the deviation of real GDP from the base level over the first five years, in percentage points)



Source : NBB.
(1) Mainly net exports of goods and services.

the decline in real GDP than the fall in consumption, though the latter has a greater weight. The appreciation of the euro causes a fall in net exports in the first year, but that effect subsequently disappears owing to the decline in imports.

The smaller decline in real GDP in Belgium during the first two years, according to the Bank's model, in comparison with the euro area is due to a smaller contraction in investments, which may be due to a slightly lower dependence on bank lending, at the macroeconomic level, and a fairly weak accelerator effect.

3. Conclusions

The first part of this article highlighted the complexity of the transmission of monetary policy impulses, characterised by long and uncertain time lags and dependent, in particular, on the state of the economy and the credibility

(1) Wage indexation causes a smaller deterioration in competitiveness and a lesser appropriation by employees of gains in the terms of trade in the case of an appreciation of the euro. However, it is not immediate and the health index is not exhaustive.

of the central bank. Some special features of the Belgian economy were mentioned, such as its high degree of openness, especially in relation to euro area partners, the high level of household financial assets, relatively weak dependence on bank lending at a macroeconomic level, and the automatic indexation of wages.

The macroeconomic simulations presented in the second part of the article showed that, in Belgium as in the euro area, a monetary policy tightening tends to cause a temporary contraction in activity, due substantially to the decline in investment, and a slower but more persistent fall in prices. The euro appreciation normally caused by such a monetary policy shock amplifies its effects on activity, but above all accelerates its impact on prices. The reaction of the Belgian economy does not appear to be obviously different from that of the rest of the euro area. It seems to be slightly more moderate in volume, owing to the lower sensitivity of investment, and more rapid in terms of prices.

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