

Dániel Felcser: How should the central bank react to the VAT increase?*

With a VAT increase, prices go up in the economy as businesses pass through the effects of the tax rise. Technically, this means that the consumer price index increases for one year; this is called the first-round effect. If, however, the expectations of economic agents are not completely rational or the inflation target of the central bank is not credible, there is a risk that agents will consider the additional inflation attributable to the VAT hike to be persistent and future inflation to remain higher than it was before the VAT rise in the long term. In this case, the effect of the tax hike may also be present in the form of higher wages and expectations. This latter, indirect process is called the second-round effect. According to the international best practice of central banks, monetary policy disregards the one-off price level increasing shocks, but attempts to offset second-round effects on inflation. However, in countries where the inflation target had not been met before the VAT rise, central banks are more inclined to also react to direct price level increasing measures, and risks relating to the anchoring of expectations are highly articulated in the communication of the central bank. As inflation in Hungary has persistently been above the target, there is a possibility that the recurring cost shocks may become incorporated into inflation expectations and may cause stronger second-round effects.

INTRODUCTION

These days, the central banks of developed countries and of a number of emerging countries set the maintenance of price stability as their primary objective. According to modern economic theory, monetary policy can most efficiently contribute to increasing welfare by ensuring the predictability of the economic environment, maintaining price stability and the stability of the financial system. Numerous central banks have chosen so-called flexible inflation targeting as the framework for this. Inflation targeting (IT) is a monetary policy strategy whereby the central bank strives to achieve its primary objective of price stability through a publicly announced inflation target. Under this regime, the central bank strives also to decrease economic volatility arising from different sources and reducing social welfare, exploiting the fact that inflation targeting provides it with a sufficiently flexible strategy. This is one of the reasons that at the international level IT has proven successful in curbing high inflation and anchoring expectations.¹

The maintenance of price stability is hindered by shocks to the economy, which may divert inflation from the desirable

level. The response of monetary policy depends on the causes underlying the change in inflation; consequently, the nature of the shock and the credibility of the commitment of the central bank to price stability need to be taken into consideration. If the shock has opposite effects on inflation and output (a so-called supply shock), then the short-term inflationary effect of the shock may be offset only at the cost of significant real economic sacrifices, and central banks try to achieve price stability in the medium term in such cases. If monetary policy is credible, the central bank has more leeway to refrain from offsetting swings which are considered to be temporary, because economic agents believe in the commitment of the central bank and expect inflation to subside later. Consequently, the temporary spike does not have any long-term effect on the pricing decisions of businesses. If, however, the expectations of economic agents are not completely rational or the inflation target of the central bank is not credible, there is a risk that agents will consider the additional inflation attributable to the one-off shock to be persistent and future inflation to be higher in the long term as well. In this case, the effect of the tax hike may also be present in the form of higher wages and expectations. This latter, indirect process is called the second-round effect. The second-round effect

* The views expressed in this article are those of the author(s) and do not necessarily reflect the official view of the Magyar Nemzeti Bank.

¹ Inflation targeting had typically been a regime for small, open economies. However, early in 2012 two central banks of global significance, the Federal Reserve Bank of the U.S. and the Bank of Japan took additional steps towards inflation targeting (for more details, see Felcser and Lehmann, 2012).

may lead to a persistently higher inflation, which, all else being equal, may require a firmer monetary policy response.

A change in the rate of the value added tax (VAT), an indirect tax, can be considered as a special supply shock where the source, the timing and the initial size of the shock (the change in the tax rate) are easy to identify.² With a VAT raise, the price level increases in the economy as businesses pass through the effects of the tax rise, but as VAT is a consumption tax, it does not typically result in any additional effect through the cost structure of businesses.³ Technically, this means that the consumer price index increases for one year; this is called the first-round effect, while in 12 months' time the one-off price level increasing effect drops out of the annual price index. In the case of a one-off tax measure, the risk of a second-round effect may be lower than in the case of typical cost shocks (e.g. oil price increases). Therefore, if monetary policy is credible, the central bank can typically dispense with offsetting the inflationary effect of a VAT increase. If, however, the consumption tax rates are changed frequently, the aforementioned second-round effect is more likely to appear, which may require a monetary policy response.

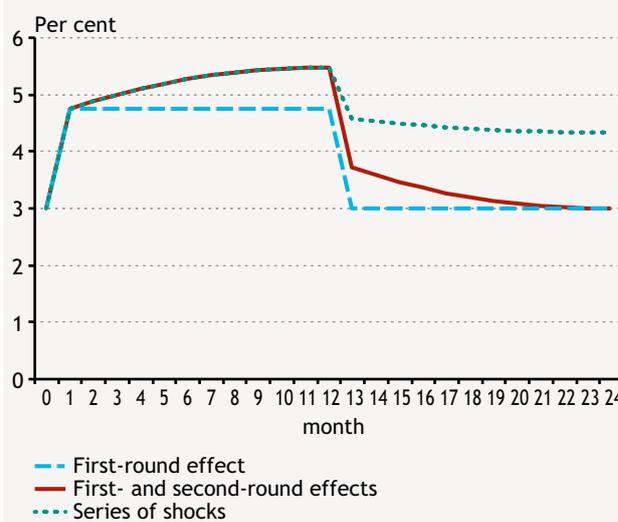
In the following, we use various scenarios to present the potential effects of a VAT rate increase, and then go on to survey international experiences. Finally, we discuss the characteristics of the current Hungarian situation.

THE GOOD, THE BAD AND THE UGLY

The VAT increase may cause the price index to rise significantly while the inflation rate adjusted for the direct effect of the tax change remains moderate, which poses a challenge to the central bank both from a monetary policy and communication standpoint. As mentioned earlier, the monetary response essentially depends on the inflationary effects of the VAT increase. To illustrate this point, we first present two cases in the one-off VAT increase scenario, depending on whether the shock has any second-round

Chart 1
Inflation scenarios after a VAT increase

(YoY indices)



effect. In our example, the VAT rise caused a close to two percentage point increase in inflation in the initial period, as the effect of the tax change is immediately built into prices (Chart 1).⁴ We assume that before the VAT shock the inflation target of the central bank had been met and no other inflation shock is affecting the economy, that is, the central bank faces only the inflationary effects of the VAT hike. Then we examine what additional risks arise if the economy is subjected to a series of shocks, instead of a one-off occurrence.

In the first case, the VAT increase has only first-round effect: the prices of the products affected rise and remain at the higher level persistently, while inflation falls to the inflation target of the central bank after a year, provided that expectations are anchored, as soon as the effect of the tax increase drops out of the annual price index. Economic agents consider the deviation of inflation from the target to be temporary and align their pricing and wage decisions to the medium-term target. Central banks do not tend to offset

² Other price shocks may also result from government measures, but in this article we concentrate on VAT increases due to their aforementioned features and because of the fact that inflation targeting central banks (IT central banks) examined typically refer to this factor in their communication.

³ Increases of the rates of taxes on consumption directly increase the price of the part of the consumer basket subject to the tax change and they may also indirectly affect consumer prices (for instance, through their effect on aggregate demand). Thus, when households bring forward some of their consumption before a VAT hike to make use of the lower tax rate, the one-off increase in demand may also result in higher price levels. We should note that according to the results Gábor and Reiff (2006) obtained for Hungary, the effects of VAT increase and VAT decrease are not symmetrical. We concentrate on VAT increases in the following.

⁴ In the example we disregard the possibility that businesses may incorporate the VAT increase in their prices in advance, in the period between the announcement and implementation of the VAT increase depending, inter alia, on the cost of the price change and the level of competition on the market. This happened at the time of the VAT hikes of 2007 and 2012 in the Czech Republic when, according to the Czech central bank, more than half of the short-term effects appeared in prices in the 2-3 months preceding the tax rise (CNB, 2012). In respect of Hungary, a previous study found no signs of that happening (Gábor and Reiff, 2006). Furthermore, the short-term effect of the VAT increase may actually exceed the longer-term increase in the price level as shops may implement some price increases originally proposed for later simultaneously with the price rise caused by the VAT hike.

such temporary inflation shocks. An argument for this approach is the temporary nature of the direct inflationary effect of the shock: by the time the monetary policy measure could have an effect, the shock has already unwound, while monetary tightening would raise the risk of undershooting the inflation target. An argument against this approach is the possibility that – as a result of the higher-than-targeted inflation – the anchoring of expectations may weaken and second-round effects may emerge after a while. That is, the stronger the medium-term anchoring of expectations and the credibility of monetary policy is assumed to be, the more the central bank can afford to forego offsetting the primary inflationary effect of the shock.

In the second, less favourable scenario, the one-off price increase is accompanied by second-round effects. While the central bank may decide not to offset the direct effects of the VAT shock on inflation, the presence of second-round effects may necessitate monetary policy action. The second-round effect is closely related to the inflation expectations of economic agents. If businesses expect inflation to persistently be above the target, they may increase their prices more than they would otherwise. If employees expect inflation to be persistently above the target, they will put forward higher nominal wage increase demands to maintain the purchasing power of their income. Businesses may be prompted to increase their prices to be able to finance wage increases. Meanwhile, higher income and the resulting higher consumption also generate inflationary pressure. Consequently, the increase of expectations for future inflation may affect the pricing and wage decisions of economic agents; inflation on the whole rises at a higher rate and more persistently than in the first scenario and, all else being equal, more monetary tightening may be required to curb inflation.

The situation is aggravated if instead of a one-off shock, a series of VAT rises keep inflation high, increasing the risk of second-round effects. One-off price level increasing shocks are generally considered to be relatively rare events; in such a scenario, the probability of cost shocks diverting inflation from the central bank target is the same as the probability of downward shocks (shocks are symmetrical), therefore, they are not expected to feed into the expectations of economic agents. If, however, consumption tax rates are changed frequently, there is an increased risk that economic agents will not think of such government measures as rare shocks with zero effect on average, and second-round effects will follow. Therefore, monetary policy may not necessarily be in the position to refrain from offsetting the VAT shocks if they are frequent and point in the same direction – for instance due to a rearrangement between direct and indirect taxes.

Consequently, the optimal monetary policy response to a VAT rise depends on the level of trust of monetary policymakers in the anchoring of inflation expectations. Typically, surveys are used to attempt to quantify inflation expectations, but due to various measurement difficulties reliable indicators are hard to generate.⁵ In general, the more a shock can be considered temporary and the less second-round effects are to be feared, the less monetary policy needs to respond.

INTERNATIONAL EXPERIENCE

During the crisis, VAT rates (mostly the standard rate) have been increased in several countries where the central bank follows inflation targeting. In most cases, the tax increase resulted in above-target inflation, as the price increases kept the price index high for 12 months. As we

Table 1
Selected VAT rate increases in recent years

Country	Date of raise	Extent of raise	Monetary policy response
Czech Republic	1 January 2010	1 percentage point <i>(general)</i>	Risk of second-round effects was deemed insignificant, no interest rate increase followed.
	1 January 2012	4 percentage points <i>(reduced rate)</i>	
United Kingdom	1 January 2010	2.5 percentage points <i>(standard rate)</i>	Expectation risk became a recurring element in communication.
	4 January 2011	2.5 percentage points <i>(standard rate)</i>	
Romania	1 July 2010	5 percentage points <i>(standard rate)</i>	Ongoing easing cycle came to a halt.
Poland	1 January 2011	1-2 percentage points <i>(various rates)</i>	One of the reasons for tightening.

⁵ For example, the expectations of households may be distorted by the tendency of households to assign a greater weight to products purchased more frequently, such as food and petrol.

saw above, central banks tend to focus on the risk of second-round effects rather than the temporary spike in inflation. However, the responses of central banks may cover a broad spectrum. To illustrate this, we looked at the monetary responses to six VAT increases of recent years by regional central banks and the Bank of England (Table 1).

The Czech central bank did not respond to VAT increases, considering the risk of second-round effects to be insignificant both in 2010 and 2012. In 2010, the inflation forecast showed inflation increasing slightly in the short term, whereas on the horizon of monetary policy the target was reached and inflation adjusted for the effects of tax changes approached the target from below. Whereas in January Czech policymakers unanimously decided to keep the interest rate unchanged, in February, as a result of inflation being lower than expected (partly for methodological reasons) they saw a downward inflation risk and a rate cut was also considered in the Board. At the time of the VAT increase of 2012, the price index was expected to temporarily rise above 3 per cent, which significantly exceeded the 2 per cent target of the Česká národní banka (Czech National Bank), but the price index is expected to fall early in 2013. Inflation adjusted for tax effects is forecast to be around the target throughout the horizon. The Board perceived an upward inflation risk in the development of food prices; on the whole, their assessment of the risks was balanced. The potential second-round effects in inflation expectations and wages were deemed insignificant, which was confirmed by anecdotal evidence and the development of expectations. In the alternative scenario of their inflation report in May they reckoned with more VAT increase to come, but based on past experience and the subdued economic climate, they still did not expect any significant second-round effects.

In the case of the VAT hike of the UK early in 2010 (which was a re-raise of the rate after the VAT rate cut at end-2008), there were signs indicating that the pass-through of the VAT hike may be somewhat greater than previously expected. Moreover, the fuel price rise also increased inflation. If inflation remains persistently above the target for years, expectations may also increase – but on the whole the Bank of England saw little evidence that the inflation expectations of households or of money market participants had changed significantly in the second half of 2009. In addition to the disciplinary power of unused capacities on pricing, the forecasts for the period when the effects of the weakening exchange rate and the VAT increase would end indicated that inflation would fall below the target. Consequently, no monetary tightening was deemed necessary.

Early in 2011 inflation was considerably above the target due to the repeated increase of the standard VAT rate and the higher energy and import prices. According to the Board, medium-term inflation risks had also risen (Bank of England, 2011). The central bank emphasised that in such an environment it was particularly important how much economic agents relied on past inflation when formulating their expectations and how long they envisage the horizon over which the Bank of England can meet its target again. In its communication, the Bank of England emphasised the risk of second-round effects repeatedly in view of the inflation being persistently above target. The inflation expectations of households started increasing in previous months whereas the expectations of businesses, and expectations derived from money market prices and wage growth remained stable. Eventually, the VAT rate hike dropped out of the basis early in 2012, the incoming data indicated a significant decline in inflation, which reduced the expectation risk.

The above cases share the common element that inflation expectations can be assumed to be anchored in both countries. Where the inflation target had been met on average for a longer period, second-round effects gave less cause for concern and the central bank 'looked through' the one-off spike in inflation. However, in countries where the inflation target had not been achieved, central banks were more inclined to also react to direct price level increasing measures, and thus the tax change had an impact on their interest rate decisions.

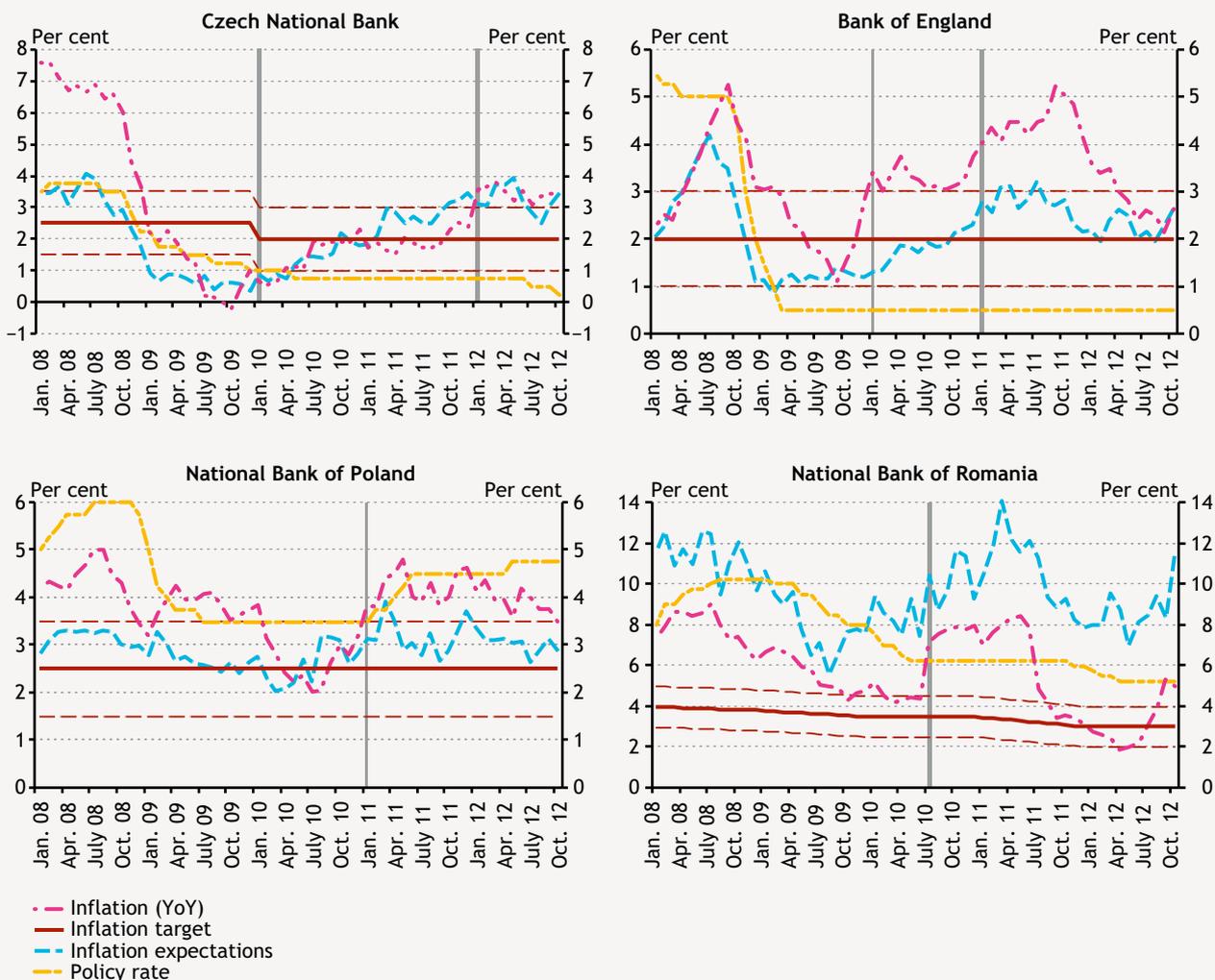
One such central bank is the Banca Națională a României (National Bank of Romania), whose decision making body, at its meeting at the end of June 2010, abandoned the interest rate cut cycle started at the beginning of the year, in the course of which it had reduced the base rate by 175 basis points in total. The decision was motivated mainly by the expected rise in inflation as a result of the VAT increase and the need to anchor expectations so that the appearance of second-round effects in consumer prices can be avoided. Against the backdrop of a significant, but temporary spike in inflation, the central bank continuously emphasised during the summer that it was striving to mitigate second-round effects and anchor inflation expectations at a low level. Taking into account the inflation reducing effect of the negative output gap, decreasing inflation towards the target was expected for the end of 2011, after the first-round effect of the tax change drops out of the price index. In the medium term, however, they called attention to the risk of second-round effects through rising expectations. The risk remained despite the inflation figure in September being slightly less than expected, while the base rate was not modified again during 2010. The first-round effect of

the VAT rise petered out in one year; as a result, inflation had subsided to 3.5 per cent, which is close to the target, by September 2011. After this, the Board embarked on another interest rate cut cycle in November.

In the case of the Narodowy Bank Polski (National Bank of Poland), the motives underlying the rate increase may have included fears of rising inflation expectations. The rise in the inflation rate in Poland early in 2011 was attributable mainly to the VAT rate increase, the global rise in agricultural commodity prices and oil prices as well as an increase in regulated prices. Parallel with the inflation rate, core inflation and the inflation expectations of households also rose. The Board decided on a 25-basis point base rate increase in January already, citing inflation risks. Because of rising inflation, there was a risk that expectations would be stuck at a higher level, which would call for further

monetary tightening. At its next meeting in early March, the Board did not see such a measure justified: in its assessment, the interest rate increase of January in combination with the subdued economic climate, the moderate wage pressure of businesses and rising unemployment had sufficiently reduced the inflation risks. In April, however, it was already evident that core inflation and expectations had both continued rising, and the incoming real economic data showed that increasing inflation pressure was to be expected from the demand side. Consequently, the Board decided to continue monetary tightening to mitigate the risk of inflation being above the target in the medium term. The tightening cycle started in response to the rising inflation may have also played a part in the current anchoring of expectations. More firmly anchored expectations also mean that the latest rate cut may incur less inflation risk.

Chart 2
Inflation, expectations and the policy rate in the countries analysed



Note: The vertical lines indicate the VAT rate increases analysed. The broken lines indicate the tolerance interval around the inflation target. Inflation expectations quantified from the survey of the European Commission, based on Gábel (2010).
Sources: IFS, MNB, central banks and national statistical offices.

It is notable in the inflation history of the countries analysed that they typically considered firmer monetary policy responses necessary in cases where the inflation target had not been met in the prior period and consequently there was a higher risk of increasing inflation expectations (Chart 2). In contrast, where the target had been met, there was more confidence in the anchoring of expectations, and thus there was less fear of second-round effects.

OVERVIEW OF THE SITUATION IN HUNGARY

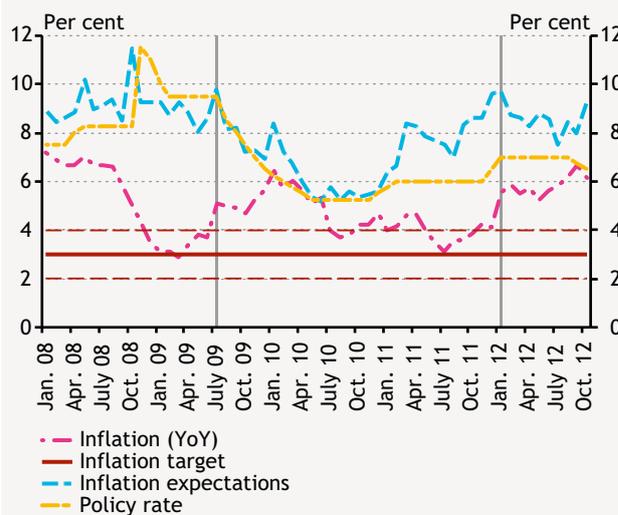
Inflation in Hungary has been significantly above target for a considerable length of time. Since the introduction of the continuous inflation target early in 2007, inflation has been above 5 per cent on average. The so-called constant tax rate index calculated by the Hungarian Central Statistical Office (HCSO) to filter out the immediate direct effect of changes in indirect taxes was approximately 1 percentage point lower on average during the period but it was still above the 3 per cent target. According to policymakers, when assessing the achievement of the inflation target, fluctuations resulting from unexpected effects must also be taken into consideration, and therefore a consumer price index departing from the 3 per cent target by no more than ± 1 percentage point is acceptable *ex post* for purposes of price stability. However, inflation was above the 4 per cent ceiling thus calculated in three quarters of the period. In the case of the constant tax rate index, this ratio is below 40 per cent, which is still not negligible and shows the importance of indirect tax rises in the development of inflation.

Inflation remaining persistently above target may endanger the anchoring of expectations. This risk arises because economic agents, perceiving inflation to significantly exceed the target of the central bank, may conclude that the central bank is more tolerant of short-term deviations in inflation or doubts may arise concerning the commitment of the central bank or its ability to bring inflation back to target in the medium term (Macallan et al., 2011). This may cause their inflation expectations to rise, which in turn will be reflected in their pricing and wage decisions. The more credible the central bank is, that is, the longer the period that it was able to maintain price stability, the less likely the above risk is to materialise.

International experience also shows that persistent deviation from the target raises inflation expectations, which start declining only when inflation is back around the target again (Corder and Eckloff, 2011). Research findings indicate that short and medium-term inflation expectations are slower to shift than inflation itself, and they gradually

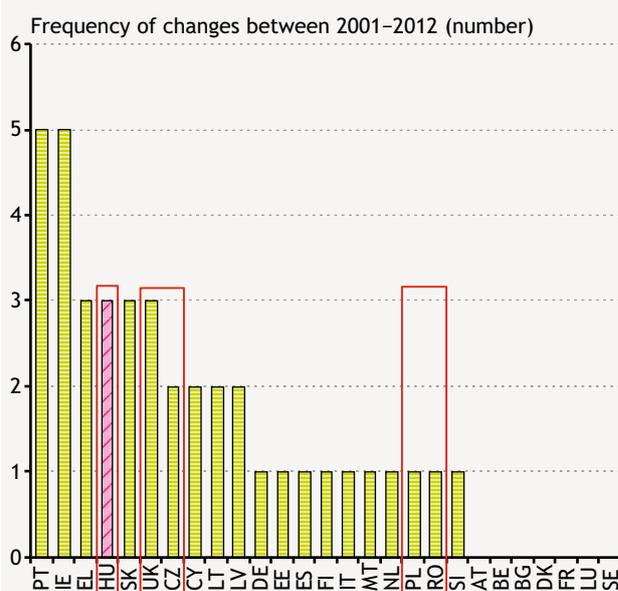
return to their previous level once inflation is back on target. However, the return of (medium-term) expectation takes time. In half the cases investigated, where inflation was persistently off-target, inflation deviated from the inflation target for 9 quarters at the most – the Hungarian figure is significantly higher than that. This also seems to indicate that in Hungary there is a considerable risk that

Chart 3
Inflation, expectations and the policy rate in Hungary



Note: The vertical lines indicate the VAT rate increases analysed. The broken lines indicate the *ex post* tolerance interval around the inflation target. Inflation expectations quantified from the survey of the European Commission, based on Gábel (2010). Sources: IFS, MNB.

Chart 4
Frequency of changes to the standard VAT rate in EU Member States between 2001 and 2012



Note: The countries analysed are highlighted. Source: European Commission.

inflation expectations are not anchored, as in the past 5 years monetary policy has been unable to stabilise inflation for a longer period around the 3 per cent target (Chart 3). This is also suggested by the results of Gábrriel (2010), to the effect that in Hungary expectation shocks have played an important part in explaining the volatility of inflation and the development of inflation and wages. Accordingly, the inflation target of the central bank probably fails to sufficiently coordinate the expectations of economic agents; therefore, there is greater probability of temporary inflation shocks having second-round effects.

High inflation is partly attributable to frequent and substantial cost shocks: in recent years food and oil price increases and tax measures with inflationary effects have come one after the other. The changes in the Hungarian VAT rates would be considered frequent by international standards, and thus the outstanding volatility of the standard tax rate did not contribute to a predictable economic environment and the evolution of firmly anchored inflation expectations (Chart 4). Accordingly, there is a risk that of the scenarios described above, the one containing a series of shocks will materialise.

CONCLUSIONS

The illustrative scenarios and international experience outline the typical response of central banks to VAT increases: where inflation expectations are anchored, it may be assumed that government measures directly increasing price levels have no persistent effect on inflation, and monetary policy does not respond to them, while it does offset any second-round effects appearing in wages and expectations. The international best practice of central banks relies on the assumption that price level increasing shocks are relatively rare and symmetrical. This assumption is the reason that central banks may be justified in thinking that such shocks are not built into the inflation expectations

of economic agents. In the case of Hungary, however, there are arguments that the risk of second-round effects is greater. On the one hand, based on the persistently above-target inflation and survey results, the anchoring of inflation expectations around the target is questionable. On the other hand, in recent years economic agents may have become accustomed to the rearrangement of Hungarian consumption tax rates; therefore, it may be reasonable that they do not think of the government's price increasing measures as rare shocks with zero average effect.

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