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ОРИГИНАЛНИ НАУЧНИ РАД

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UNDERSTANDING THE FIRM-LEVEL PRICE-SETTING BEHAVIOUR: THE DEVELOPED COUNTRIES EXPERIENCES AND INSTRUCTIONS FOR SERBIA

Abstract

It is important for central banks to understand how firms set prices. The price-setting behaviour plays a key role in the monetary policy transmission mechanism. To be able to understand and predict how monetary policy impacts on macro variables such as output, employment and inflation, it is useful to have information on what lies behind the choices made by each individual economic subject. Which factors determine firms' price-setting is a particularly important question. This paper outlines the major themes and results on price-setting behaviour that have emerged from international research on the basis of surveys conducted by central banks of many developed countries.

Key words: *price-setting behavior, price stickiness, frequency of price changes, survey data, monetary policy.*

РАЗУМЕВАЊЕ ПОНАШАЊА ПРИ ОДРЕЂИВАЊУ ЦЕНА НА НИВОУ ФИРМЕ: ИСКУСТВА РАЗВИЈЕНИХ ЗЕМАЉА И ПОУКЕЗА СРБИЈУ

Апстракт

За централне банке је важно да дознају како фирме одређују цене. Понашање у погледу одређивања цена игра једну од кључних улога у трансмисионом механизму монетарне политике. Да би били у стању да разумемо и предскажемо како монетарна политика делује на макро варијабле, као што су производња, запосленост и инфлација, корисно је имати информације о томе шта стоји иза избора учињених од стране сваког економског субјекта. Фактори који опредељују фирму при одређивању цена, представља посебно значајно питање. Овај рад скицира главне теме и резултате у погледу понашања при одређивању цена који су проистекли из међународног истраживања на бази анкета, спроведених од стране централних банака многих развијених земаља.

Кључне речи: *понашање при одређивању цена, лепљивост цена, учесталост промена цена, подаци анкете, монетарна политика.*

Introduction

The way on which the firms set their prices is highly important for formulating and implementation of monetary policy. The price-setting behaviour influences the way of monetary policy affecting the economic activities flows. The key issues for the central bank are whether the prices are sticky – i.e. is their response slow to changes in the economic environment – namely, are they responding asymmetrically to excess demand and excess supply. The answers to those two questions have implications on the conduct of monetary policy: for example, how rapidly are monetary authorities capable to bring inflation back to the defined target after the economy had suffered a shock Also, those answers are shaping the process transmitting changes in monetary policy to the real activity (output and employment) and inflation.

In many economic models, often used in analyzing monetary policy, some constraints are assumed in price adjustment. Some time interval is assumed to exist between each individual change in the price of goods or services. Such a sluggishness in price setting is the factor enabling monetary policy to impact, in short-term, real interest rate as well as real variables (like output and employment). In long- term monetary policy determines only the inflation rate. The potential of monetary policy is higher with stickier prices, since the central bank is capable to largely lessen fluctuations in output and employment. In other words, one of the key issues for the central bank is how slowly are prices in the economy adjust to market conditions.

During the last decade the central banks in the developed countries conducted a new research, tending to enhance their understanding on the firm-level price-setting behaviour. In this research work new information had been revealed on the frequency with which firms change prices and explanations acquired about the reason of the prices being sticky. Using the surveys in order to get a better insight into the firm's price-setting behaviour was first applied in USA. The way of such an application was cleared by the work by Blinder (1991) and Blinder et al. (1998). Those works led to similar surveys in other developed countries – in United Kingdom (Hall et al., 1997), Sweden (Apel et al., 2005) and in Euro areas countries (Fabiani et al., 2006).

The paper is structured as follows. Section 2 explains why price setting is important to a central bank concerned with controlling inflation. The next section is a brief overview of the major themes and results on price-setting behaviour that have emerged from international research on the basis of surveys conducted by central banks of many developed countries. Section 4 presents some general information regarding the price-setting behaviour of Serbian firms: up to now no research was conducted regarding the pricing behaviour of Serbian companies, and hoping that such a research is going to be conducted soon; and the assumptions regarding some characteristics of price-setting behaviour in Serbia. The final section contains our conclusions and some directions for further researches work.

1. Why is Price Setting Important?

Understanding price setting in the companies is important for the central bank's attitude in inflation controlling. The price-setting behaviour determines how decisions about monetary policy – on interest rate, money and inflation - affect the economy. In the former theories on macroeconomy monetary variables were assumed to exert no influence on the real ones. Those theories were partly based on the idea that price-changes are costless and instantaneous. However, anyone having participated in buying or selling an item knows that in reality prices are set by buyers and sellers, and costs and time appear as factors in the sale contract. Two factors take part in calculating the right price of any product, i.e. determinate how prices should respond to a change on the market. Anyway, a number of empirical proofs supported the view about the changes of money and prices (nominal quantities) being capable to influence production and employment (real quantities), at least in short-term.

The views referring to the importance of price stickiness as one of the major issues in macroeconomics varied in time. In the 1960s and 1970s the economists generally accepted the presence of sticky prices and their ability to generate real-side disturbances in the face of monetary policy shocks. At the end of 1970s and 1980s a number of academic research was focused on real side of the economy. Two economic paradigms – the rational-expectations and real-business-cycle models – rejected the presence of sticky prices and denied the role of monetary policy in stimulating growth during the periods of slack demand.

On the contrary, in 1990s and 2000s, the literature dealing with macroeconomic issues revealed a general acceptance of price stickiness and a possible important role of monetary policy in an economy functioning beneath its potential capabilities. Consequently, the economists turned to accessory means for assessing the price stickiness level. An approach having reached a rapid popularity consists in a direct survey of the economic agents-firms about their price setting.

The modern theory of monetary policy is the theoretical basis of the approach by survey. In this theory a number of assumptions are presented of how an individual firm is setting its prices. For example, it is often assumed that the firms are alike, that there is a certain interval between each time a price is changed and that price-setters are forward-looking. Simultaneously, aggregate price movements are the result of the pricing decisions of all participants on the market. Consequently, knowing the determinants of prices on the individual firm's level is highly useful to each central bank.

2. Price-setting Behaviour

For a long-time it was proved in the economic theory that the speed of the firms changing their prices is determined by the extent to which fluctuations in the demand of goods and services lead to fluctuations in production rather than in prices. When the prices are inflexible, sticky, i.e. sluggish, a disproportional part of the adjustment of the economic subjects-firms to economic shocks appears through the changes in the scope of production, employment and the level of the capacity utilization, rather than through changes of their products prices. The sluggish price adjustment makes the implementation of monetary policy more difficult, not only due to possible long lags between the changes of monetary policy and changes of prices, but also due to resultant fluctuations of output levels, possible to be expensive.

During the last decade researchers in a number of countries used new data sources in order to investigate the frequency of the firms adjusting their prices. Some of those researches were based on detailed surveys regarding the individual firm's behaviour, and some relied on data gathered by the national statistical agencies. The results acquired by those researches pointed to considerable differences. At one extreme point stood the firms (in fact not numerous) adjusting their prices on a weekly basis. On the other extreme point were those (relatively numerous) adjusting their prices less than once every two years. Between those two extremes were the firms adjusting their prices in regular calendar cycles and those taking such measures only after their cost structure underwent a shock from the environment they carry on their business.

The works by Okun (1981), Kahneman, Knetsch and Thaler (1986) and Blinder (1991) largely traced the path of all recent research regarding the way the firms adjust their products prices. Okun developed the theory of the firm price adjustment, based on the idea of "costly search". He proved that the customers find costly searching for those firms offering reliably and timely products of high quality and reasonable prices. When the customer finds such firms he (or she) sticks to them permanently. So long-term and stable connections are set between the customers and the firms. The firms still change their products prices, but taking care not to harm their connections with the customers. And finally, Okun assumed that the firms are reluctant to rise their prices level as the way of responding to demand shocks, worrying about their customers possible reluctance.

Kahneman et al. (1986) surveyed people on their views about when changing the firms products prices would be acceptable. A great majority of people are of opinion that rising the products prices in a firm would be justified with the increase of its business operation costs. On the other side, the respondents told that they would not object to the firm not lowering the prices after decreasing the costs of its business operation. The respondents consider as acceptable the decrease of products prices with a low demand. But it would be unfair if the firms rise their products prices above a normal level in case of a high demand. The author argues that the firms should act accordingly, so that their asymmetric responses to demand and cost shocks could be observable.

Blinder (1991) and his associates (Blinder et al., 1998) conducted intensive interviews in a number of firms in USA regarding their pricing behaviour[1]. The authors asked a number of questions, as: How often are the firms changing their prices? How do the firms respond to changes of costs and demand? Do the frims set their prices according to the theories in textbooks regarding price stickiness? The answers were convincing enough, so the application of surveys on price-setting bahaviour appeared also in a number of other countries. Most frequently the surveys were conducted by the central banks. The researchers in Europe and in North America analyzed the firm-level price data to get an insight how often are the firms changing their retail and wholesale prices.

The results of the reasearch by Blinder and his associates provide a better understanding of not only the frequency of the firms prices changes, but also of the reasons for such changes. Considering the frequency of price changes, the results obtained pointed that just some firms change their prices very often, and a number of them do it occasionally. Blinder found out that 10% of the American firms change their prices once a week, and 50% not more than once a year. According to more recent resaerch in this field, 25-30% firms in USA change their prices each month, while an average duration between price changing amounts to 6 or 7 months (Bils and Klenow, 2004; Klenow and Kryvtsov, 2005). It seems that the European consumer prices are stickier. The interviews conducted in a number of European countries point

[1] Prior to Blinder, mainstream economists were skeptic to the use of firm-level survey and interview data. Due to the success of this survey, this situation is changing rapidly.

that approximately 15% consumer prices are changed each month, while the average duration between price changes amounted to somewhat over a year (Dhyne et al., 2006).

Also, the reasearches of price-setting behaviour were focussed on the reasons of the firms changing their products prices. The survey used by Blinder (and his associates) contained a section where the respondents were confronted with different theories of price rigidity and were asked to answer to what extent do those theories appropriately present the situation in their firm. Namely, the respondents were asked to rank the importance of each statement formulated to summarize different theories explaining why prices must be sluggish. The firms got a list of twelve assumed reasons for their not changing prices more frequently. Each of the reasons offered represented one of the theories of price stickiness. The surveyed firms were asked to rank those reasons according to their importance. In the survey by Blinder, the first five explanations (presenting the theories of price stickiness) by rank were:

- Firms hesitate to raise prices in case their competitors will not follow (coordination failure),
- Firms change prices, with a lag, to changes in costs (cost-based pricing),
- Firms change non-price features, such as varying the quality of service (non-price competition),
- Firms have an implicit understanding with their customers not to increase prices when supplies are tight, unless justified by higher costs (implicit contracts),
- Firms have written contracts which usually make it difficult to change prices within the contract period (explicit contracts).

In Table 1 the complete list of explanations (theories) is presented, not only from the survey by Blinder, but also those presented and ranked by the firms in United Kingdom, the Euro area, Canada and Sweden. As we may notice, the firms in each of those countries presented considerably similar rankings. In general, the surveys conducted in the mentioned countries support the thesis about the firms changing their prices responding more to cost changes than to demand changes .

Table 1
Explanations, importance and ranking of price stickiness theories
Country Study and Rank

Theory	Explanation	US	UK	EA	CA *	SW
Cost-based Pricing	Prices depend mainly on the costs of labour and raw materials used in producing goods and services. Therefore, prices don't change until costs change	2	2	3	1	2
Explicit Contracts	The price is regulated in formally-written contracts that are costly to renegotiate	5	1	2	3	3
Implicit Contracts	Customers prefer a stable price and a change could damage customer relations, even if competing firms also change their prices	4	5	1	2/7	1

Coordination Failure	Firms delay price increases because they do not want to be the first in the industry to raise prices. Firms delay price cuts because they do not want to be the first in the industry to cut prices	1	3	4	5/8	4
Non-price Competition	Firms are more likely to amend product characteristics (e.g., warranty, delivery lag) than prices	3	8	7	4	-
Pricing Thresholds	Psychological “thresholds” for the price exist. The article/service is assumed to sell much better at $49.95 than $50.05, for example	8	4	10	-	7
Constant Marginal Cost	Factors influencing prices, such as marginal costs, do not change over the business cycle	9	6	-	9	-
Manu costs	There are “physical” costs connected with price changes, e.g. printing new price lists, the cost of notifying retailers, etc.	6	11	8	10	11
Information-gatheriting costs	It is costly in terms of time and/or money to gather relevant information for pricing decisions	11	-	9	11	12
Procyclical Elasticity	Prices are sticky because firms loose customers when prices raised but gain few when lowered	7	9	-	-	10
Stock Adjustment	Firms adjust stocks rather than prices to accommodate shocks to market conditions	10	7	-	-	-
Price Means Quality	Firms may be unwilling to cut prices in case customers think there is a decline in quality	12	10	5	-	-

*) In the column for Canada, two figures are reported for the implicit contracts and coordination failure theories, because in the Canadian questionnaire there are two different statements related to these theories.

Sources: United States (US): Blinder et al. (1998), United Kingdom (UK): Hall et al. (2000), Euro Area (EA): Fabiani et al. (2006), Canada (CA): Amirault et al. (2004), Sweden (SW): Apel et al. (2005).

In the research of the dynamics of prices conducted in some developed countries, a number of other valid findings were presented as well. The following list of findings, based on the work of Fabiani et al. (2007, pp.7-8, 47), presents a summary of research conducted (by the Eurosystem Central Banks) in the majority of the Euro area countries:

- The frequency of price changes varies considerably from firm to firm,
- The average frequency of price changes varies by sectors,
- Energy sector firms change prices more frequently than other firms,
- Firms that use a lot of raw materials change prices more frequently than firms that use few raw materials,

- Firms that are labour intensive, particularly in the service sectors, change prices less frequently than others,
- Firms in the Euro area change their prices less frequently than those in the United States,
- There is little evidence of downward price rigidity, except in the services sector,
- Price-setting responds asymmetrically to factors such as changes to cost and demand.

3. Do We Know Something About the Price-setting Behaviour of Serbian Companies?

Monetary policy in Serbia is oriented towards maintaining a low and stable inflation. In order to be capable to understand and predict the way of the monetary policy's influence on macro variables, like output, employment and inflation, we should dispose of information about the determination of the basic economic subjects behaviour (in the sense of taking different choices). What factors do determine the firm's price setting is a question of particular importance.

The research capable to identify the empirical features of price-setting behaviour at the level of price setter in Serbia was not conducted by now.According to some indications, such a research could be conducted soon. We can just guess that the price-setting patterns are more or less similar to those observed in Euro area countries. Probably our future analysis shall point to the following:

- that different factors influence price rises and price falls. Higher costs – in particular, labour costs and raw materials – are the most important driver behind price rises, whereas lower demand and competitors' prices are the main factor resulting in price falls;
- that firms adjust prices asymmetrically in response to shocks: cost shocks are more important for resulting in price increases than price decreases; reductions in demand are more likely to induce price changes than increase in demand;
- that the frequency, inflation persistence and inflation rate are higher in Serbia as compared to West;
- that firms change prices in Serbia more in response to changes in monetary policy than demand shocks.

Conclusions

Long ago the central banks noticed that the speed of firms adjusting their products prices is one of the key factors considerably influencing the monetary policy effectiveness and the costliness of its realization. The academic economists, but also bankers from the central banks, hold an opinion that a better insight into the reasons of the firms changing their products prices could be of great help to the central banks, being the monetary policy carrying institutions. A better understanding of the firms asymmetric adjustment to the positive or negative demand shocks is possible to provide the central bank with a better “textbook” of the monetary policy operation, particularly in the economy with a downward in business activity.

On the international level, future research should focuss on the analysis of monetary policy rules under asymmetric price rigidity and cross-country comparisons of monetary policy practice. More empirical evidence on asymmetric pass-through and asymmetric reaction of prices to positive and negative money supply shocks is desirable for Serbia as well as for other countries. Also, a microfounded theoretical explanation of asymmetric price rigidity could additionally contribute to our understanding of the problem.

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