Survey Evidence on Price Setting Patterns of Romanian Firms

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Abstract

This paper presents the results of an ad-hoc survey aimed at identifying the price setting patterns of Romanian firms. This approach, broadly employed across EMU countries under the Eurosystem Inflation Persistence Network (IPN), is new among the last 12 European Union Members. The high complexity of the survey and the broad coverage both in terms of firms' size and NACE sectors are lacking a high answer rate, the latter being around half of the average of the above mentioned studies. Operating in a relatively high competitive environment, most of firms set the price internally, among these, small firms predominantly adopting the market price while the medium and large ones opt mostly for mark-up pricing. Furthermore, most of the firms use a time-dependent price reviewing strategy with state-dependent elements, the latter strategy alone being adopted mostly by small firms. Romanian firms review and change prices more often than the firms surveyed by IPN studies, large firms adopting less rigid prices, more resources and higher mispricing costs explaining probably this finding. Similar with IPN evidence, contracts, either implicit or explicit are the main sources of price stickiness, with traditional theories (e.g. menu costs) ranking at the bottom. Wages are also in this case stickier than prices with around 72% of the firms changing their wages once per year or less often, the most important factor leading to wage variations being the change in productivity. Finally, firms usually fully transmit into their prices the impact of strong unanticipated financial shocks.

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1. Introduction

Lately, there has been an increased interest in policy implications oriented research, based on macroeconomic models with micro-foundations. These models usually incorporate various forms of nominal rigidities, which allow for monetary policy to have an impact on real economic activity over the short to medium term. The empirical evidence gathered to support such models - more prominently those involving some type of price stickiness - has been growing steadily in the recent periods[1], both from looking at aggregated and micro- or firm-level data. While one can argue that evidence based on aggregated data is sometimes dependent on the assumptions used and methodology employed, micro-level research offers complementary and more direct evidence regarding the price-setting behavior of firms.

This latter strand of the literature can be broadly divided into three categories, according to the specifics of the data analyzed and the methodology employed. One category analyzes data from a particular sector of the economy or a specific group of firms (e.g. Kashyap, 1995 looks at US catalogs; Dutta et al., 1999 investigates pricing behavior for US supermarket chains, Copaciu, 2004 analyzes prices for Hungarian supermarkets). When compared with papers that analyze disaggregated data used for the construction of the CPI index, like the one of Bils and Klenow (2002), Neves et al. (2004) and Aucremanne and Dhyne (2004)[2], the first category papers are more suitable in analyzing the specific causes and costs a firm faces when deciding on its pricing policy. Finally, a third set of studies uses a survey-based approach in documenting various aspects of price stickiness. Its main advantage lies in the fact that it allows for additional insights and permits a clear inventory and ranking of the causes and patterns of price stickiness. This class of research was initiated by Blinder (1991) for US firms and extended by Apel et al. (2005) for Swedish firms, Hall et al. (1997) for UK firms and Fabiani et al. (2004) for Italian ones. Recently, the use of this methodology has spread considerably on account of a number of survey-based studies conducted within the Eurosystem's Inflation Persistence Network (IPN). Fabiani et al. (2005) offers a comprehensive overview of the results obtained through this research for the euro-area countries.

When it comes to the New EU Member States (NMS), however, micro-level evidence of any of the three categories mentioned above is rather scarce. To our knowledge, the only related research belongs to the first two categories of studies and was carried out for Hungary and Slovakia[3], while no evidence of the third type is yet available. The present study, which has involved a broad survey of Romanian firms, comes to fill this gap, being the first of this type conducted for a NMS economy. Besides capturing various price-setting behaviors of Romanian companies and comparing them with those revealed by surveys from developed economies, we also tried to capture the perceived impact of interest rate and/or exchange rate shocks on prices and costs, an aspect not covered until now in similar studies.

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[1] The studies of John Taylor (1999) and Alex Wolman (2003) offer a comprehensive overview of the literature regarding price and wage adjustment processes (the latter aspect is present only in Taylor's study).
[2] Alvarez et al. (2005) presents a broad overview of this category of studies.
[3] See Copaciu (2004), Ratfai (2003, forthcoming) for Hungary and Coricelli and Horvath (2006) for Slovakia.

The analysis presented here focuses on four main sets of issues. First, it tries to determine whether Romanian firms follow state or time dependent pricing rules, the type of info used when changing prices, the way prices are formed and the frequency and size of price changes. Second, it looks at the determinants of price changes and tries to evaluate the different theories explaining price stickiness at the firm level. Wage setting behavior is also briefly touched upon, since wage stickiness is another rigidity that could influence the conduct and the impact of monetary policy. Finally, firms' price reaction to potential shocks on interest rates and exchange rate and Romanian exporters' behavior on international markets are investigated.

The main findings of the paper can be summarized as follows: most Romanian firms declare to set their prices internally; nevertheless they appear to be operating in a relatively high competitive environment, more prominently in the case of small enterprises, which predominantly follow the market price and less so in the case of medium and large firms, which mostly use mark-up pricing. Most of the firms surveyed use a time-dependent price reviewing strategy with state dependent elements, the latter strategy alone being adopted mostly by small firms. On average, Romanian firms review and change prices more often than the firms surveyed by IPN studies, with large firms being more active in adopting less rigid prices, probably due to non binding resource-constraints and higher mispricing costs. Similarly to IPN evidence, contracts in either their implicit or explicit form are the main sources of price stickiness, with traditional theories (e.g. menu costs) ranking at the bottom. Survey evidence also suggests that wages are stickier than prices, with around 72% of firms changing their wages just once per year or less. The most important factor chosen by respondents as leading to wage variations is the change in productivity. Finally, firms generally admit to fully transmit into their prices the impact of strong unanticipated financial shocks.

However it should be mentioned that the results are subject to some inefficiencies, part of which are inherent to any survey-based analysis and part due to the fact that most Romanian firms were confronted for the first time with this type of survey. The latter might explain the relatively low response rate (19.83%), when compared to the average of the IPN studies (approximately 45%[4]). Another potential drawback of the survey approach is that it misses to capture entirely the quality adjustments of firms' main products, which can have an important impact on their pricing strategy and consequently on inflation[5]. Related to this, one possible extension of this research may involve periodically repeating the survey using the same sample and a slightly modified questionnaire in order to capture the aspect of product quality enhancements. Another line of future research should be directed to augmenting our results with analyses of detailed balance sheet data of Romanian firms. Finally, given the central bank's objective in terms of CPI inflation and the use of micro-founded models in the central bank for policy research and forecasting, the complementary approach employed also by the IPN of investigating the disaggregated data used for CPI compilation should be pursued if the necessary data becomes available.

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[4] Weighted average results based on data presented in Fabiani et al. (2005).

[5] Filer and Hanousek (2003) estimated that in the case of the Czech Republic inflation was overstated by more than four percentage points a year during the last decade, mainly on account of non-captured quality changes.

2. Methodological issues

The survey was carried out with the help of the National Bank of Romania (NBR) and the Public Policy Center (CENPO) between September and November, 2006. The questionnaires were sent to firms in paper form by traditional mail. The survey was targeted to reach the companies' top managers. The options for sending the answers were: (i) by returning the addressed envelope that was also sent, (ii) by fax or (iii) by emailing the completed survey[6].

2.1. The sample design and post-weighting procedure

The starting point in constructing the sample was a Ministry of Finance database containing all firms that reported their balance sheets and profit reports to the fiscal authority in June 2005. In principle, this database covers the whole population of the Romanian firms. The data was filtered in several steps, starting with getting rid of the firms for which some anomalies were discovered (e.g. 0 turnover). The companies remaining in the database after this point will be referred to from now on as the ***initial population***.

The second step consisted of eliminating the firms with fewer than 10 employees. This cutoff is also used in other studies like Alvarez and Hernando (2005) or Martins (2005) and it is meant to avoid over-representing very small firms. The remaining companies after this point are to be called throughout the paper as the ***population.***

It should be mentioned that, notwithstanding the filtering of the initial population, the NACE sector coverage is broader when compared with most of the studies carried out within IPN, our survey being similar in this respect with the one carried out in the Netherlands by Stokman and Hoeberichts (2006). The covered sectors include: agriculture and related activities (NACE 1, 2 and 5)[7], manufacturing (NACE 15 to 37), energy (NACE 40 and 41), constructions (NACE 45), trade (NACE 50 to 52), hotels and restaurants (NACE 55) and transport and communications (NACE 60 to 64). A more detailed list is provided in Appendix (Table A.1).

The third step was the actual sample design. The firms retained after the second step (***the population)*** were split into three groups, according to their number of employees: small firms (firms with 10 to 50 employees), medium firms (firms with more than 50 employees but less or equal than 250) and large ones (firms with more than 250

[6] If firms chose to email the completed questionnaire, an electronic copy would be sent to their specified email address (since a priori we did not know the email addresses of the firms).

[7] Although in other similar studies agriculture and related activities are not included in the enquiry, in the case of Romania they were considered too important to be omitted. Among the new member states of the European Union, Romania stands out as having a very high proportion of its population residing in rural areas and a relatively high contribution of agricultural production to the overall GDP (around 10% in 2005). Moreover, there is some evidence (see Hammermann, 2007) suggesting that, although decreasing, the share of agriculture in GDP has been the main non-monetary determinant of the inflation differential between Romania and other Central and Eastern European countries. In order to capture the specificity of the agricultural sector in terms of price-setting behavior, seasonal factors were added to the list of potential determinants of price changes.

employees). Considering the number of NACE sectors covered (38) and the above splitting according to the number of employees, 114 mutually exclusive strata emerged at this stage.

The procedure applied in designing the sample was stratified random sampling, having as criteria the number of employees. The targeted number of employees in the sample was close to the number of employees for the most homogenous stratum (with the highest number of firms and employees in the total). Firms were randomly drawn from each stratum using as a benchmark the relative frequency in terms of number of employees in the population. Two thousand two hundred and one firms were thus extracted. It should be mentioned that the above number of firms suffered changes since the database from the Ministry of Finance did not contain information about the actual judicial status of the firm. Thus, for any sample extracted the judicial status of the firms should be checked ex post and those not operating anymore/having an unclear judicial status should be removed from the sample[8]. For a number of 104 firms this was the case. Furthermore, the initial database did not contain firms' addresses, the latter being collected ex post from the Ministry of Finance site (based on the unique identification code) and internet. Problems were encountered also at this stage as for some firms the mailed questionnaire returned since the address was indicated as invalid. In the first stage, an alternative address was required from the Registry of Commerce, this (alternative address) also not being all the time the case correct. Thus, 94 firms could not be reached and were eliminated from the sample. One hundred firms, extracted randomly from the sample, were used for pre-testing the questionnaire. The pilot questionnaire was sent at the end of June 2006. Extra evaluation questions were attached. Firms had three weeks to answer.

The adjusted sample, obtained by eliminating the above three categories from the initial sample, contained 1901 firms. These firms accounted for about 10% percent of the *population* in terms of employment.

Table 1: Population, sample and adjusted sample characteristics

	Initial population	**Population**	**Sample**	**Adj. sample**
Number of employees	4 042 431	2 881 700	289754	273764
Turnover (billion euro[9])	64.50	48.91	5.64	5.48
Number of firms	498220	42112	2201	1901

Source: Ministry of Finance database and own calculations

Table 2 below shows the breakdown of the adjusted sample according to aggregate sectors and company size.

[8] One might suggest that the firms removed after this stage should be replaced through random draws with other firms. However, this would give rise to a continuum process since also the newly extracted firms' judicial status should be checked once again.

[9] Turnover in euro was computed using the exchange rate of 36050 ROL/EUR, recorded at the end of June 2005.

Table 2: Number of firms in the adjusted sample for each main sector according to their size

	Aggregated sector	Number of firms sample/adjusted sample			
		Small	Medium	Large	Total
Agriculture and related activities (NACE codes 1,2,5)	NACE 1	64	11	4	79
Manufacturing (NACE codes 15 to 37)	NACE 2	477	183	92	752
Energy (NACE codes 40 and 41)	NACE 3	4	7	7	18
Construction (NACE code 45)	NACE 4	169	48	6	223
Trade (NACE codes 50 to 52)	NACE 5	531	64	12	607
Hotels and restaurants (NACE code 55)		72	12	1	85
Transport and communication (NACE code 60 to 64)	NACE 6	101	25	11	137
Total		1418	350	133	1901

The period during which the survey was carried out was October 15 - November 15, 2006. However, at the end of this period we obtained answers from only approximately 10% of the firms in the adjusted sample. An additional 10% of firms answered after having been contacted via phone. In total, 377 firms ended up answering the questionnaire, corresponding to an answer rate of 19.83%. This represents a relatively low answer rate, being around half of the average obtained for the studies carried out under the IPN initiative. Possible explanations for this drawback include: (i) the higher complexity of the questionnaire, compared to those conducted in the EMU countries; (ii) the use of a new sample, designed specially for this study; (iii) firms' lack of experience with answering this type of surveys, especially in the case of small enterprises which accounted for a large portion of our sample.

Table 3: Answer rates in the *unweighted sample* for each main sector according to firm size

		Size of the firm			
	Aggregated sector	Small	Medium	Large	Total
Agriculture and related activities (NACE codes 1,2,5)	NACE 1	17.19%	9.09%	100.00%	20.25%
Manufacturing (NACE codes 15 to 37)	NACE 2	16.56%	25.68%	59.78%	24.07%
Energy (NACE codes 40 and 41)	NACE 3	25.00%	42.86%	71.43%	50.00%
Construction (NACE code 45)	NACE 4	15.38%	16.67%	50.00%	16.59%
Trade (NACE codes 50 to 52)	NACE 5	13.76%	26.32%	30.77%	15.46%
Hotels and restaurants (NACE code 55)					
Transport and communication (NACE code 60 to 64)	NACE 6	14.85%	12.00%	81.82%	19.71%
Total		15.16%	23.43%	60.15%	19.83%

As one can observe from Tables 2 and 3, after pooling all answers, the ex-post sample displayed an overrepresentation bias in favor of large firms. This is further reflected by the fact that despite only 19.83% of the initial number of firms are represented in the ex-post sample, these firms accounted for 67% of the total number of employees in the adjusted sample that we started off with. Thus, if inferences were to be made regarding the whole population[10] of Romanian firms, one would have to employ a post-weighting procedure. Our approach in this respect follows closely the one used by Kwapil et al. (2005) for Austrian firms, taking the number of employees as the benchmark measure. Table A.2 in the Appendix shows the details of the post-weighting procedure. *Throughout the paper, the reported results pertain to the post-weighted answers.*

2.2. The questionnaire

The questionnaire draws mainly from those developed in the context of the Eurosystem's Inflation Persistence Network (IPN), seeking thus to ensure comparability from this point of view between our and IPN's results. It is organized in six sections and it contains 26 questions. An English version of the questionnaire is presented in Appendix B.

Companies, where indicated, were asked to consider 2005 as the reference year and to relate all their answers to the product or service that generated most of their turnover during the reference year.

Section A collects general information regarding the firm, namely its main product/service and the percentage of turnover it generated in 2005. Also in this section, the main market, the destination of sales, the degree of competition, the market share and the nature of the relationship with clients are surveyed.

Section B includes information on the price setting behavior within the firm. First firms are asked about who sets prices (themselves, parent company etc.). Other aspects investigated refer to the way prices are constructed, whether firms follow state or time-dependent pricing rules, whether they are forward and/or backward looking with respect to the information they use, the number and size of price changes and the months in which changes usually take place.

Section C gathers information on the determinants of price changes, in such a way as to reveal their perceived asymmetries between price decreases and price increases. Furthermore, the different theories put forward for explaining price stickiness are evaluated.

Information regarding the main patterns and causes of wage setting behavior is collected in Section D.

The questions in Section E seek to investigate whether Romanian firms are able to absorb potential macroeconomic shocks (such as exchange rate depreciation/appreciation or higher interest rates) through cost and/or profit margin adjustments or whether such shocks are more or less fully transmitted into prices.

[10] In the actual context, population refers to the concept defined in the paper, namely firms present in the database of the Ministry of Finance in June 2005, having more than 10 employees.

Finally, section F focuses on only a subset of the sampled firms, namely those for which more than 20% of their turnover is exported. These firms were asked to evaluate the different factors of price discrimination across markets and the reaction of their export prices to an appreciation of the domestic currency.

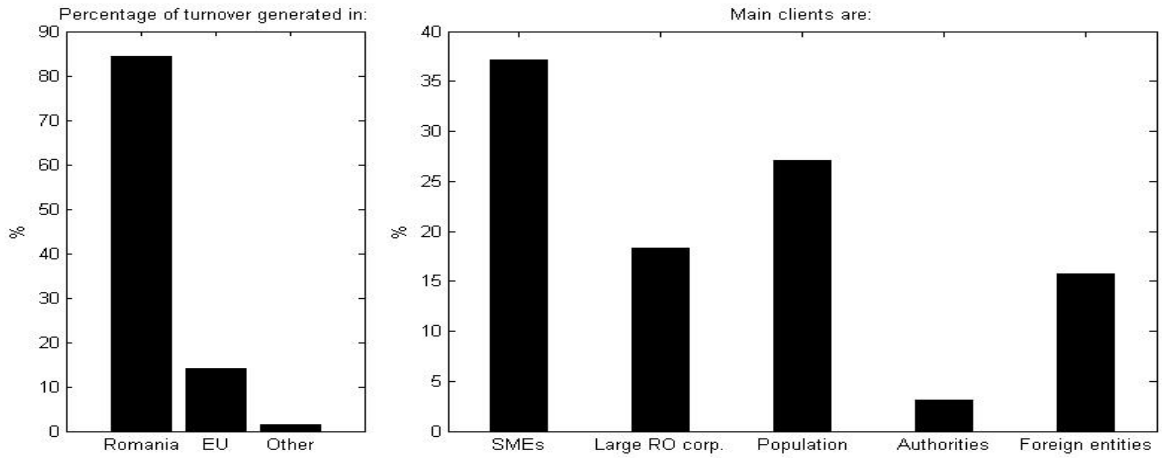
3. Main market characteristics

3.1. Main product and main market

When completing the questionnaire, firms were asked to relate all the answers to their main product. In order to better anchor the answers received, the main product was identified as the one that contributed the most to the company's turnover in 2005[11]. The answers indicated that the main product generated an average of 81% of firms' turnover[12]. Across big NACE groups (as defined in Table 3), there is a lower contribution for firms in the wholesale and retail trade sectors, namely 76%, which is consistent with the larger number of products these companies usually sell. Across firm size, there is a slightly smaller contribution of the main product to the 2005 turnover for large firms.

The main market was identified by the firms as being the domestic one. Namely, 84% of their turnover was generated on average from sales in Romania, while approximately 14% resulted from the business with partners from the EU and only 2% from business elsewhere. Firms in the manufacturing sector (NACE 2) and those in the NACE 6 group, (especially transportation firms) have shown to have a higher proportion of their turnover generated from relations with EU partners, a feature also retained in IPN studies such as those on Italy and Spain. When considering size, large firms have almost equal proportions of their turnover generated from sales in Romania and the rest of the EU[13].

Figure 1: Geographical source of turnover and main clients



[11] Firms in the service sectors were asked to identify the main service that contributed to their turnover in 2005.

[12] All the numbers reported are rounded to the nearest integer.

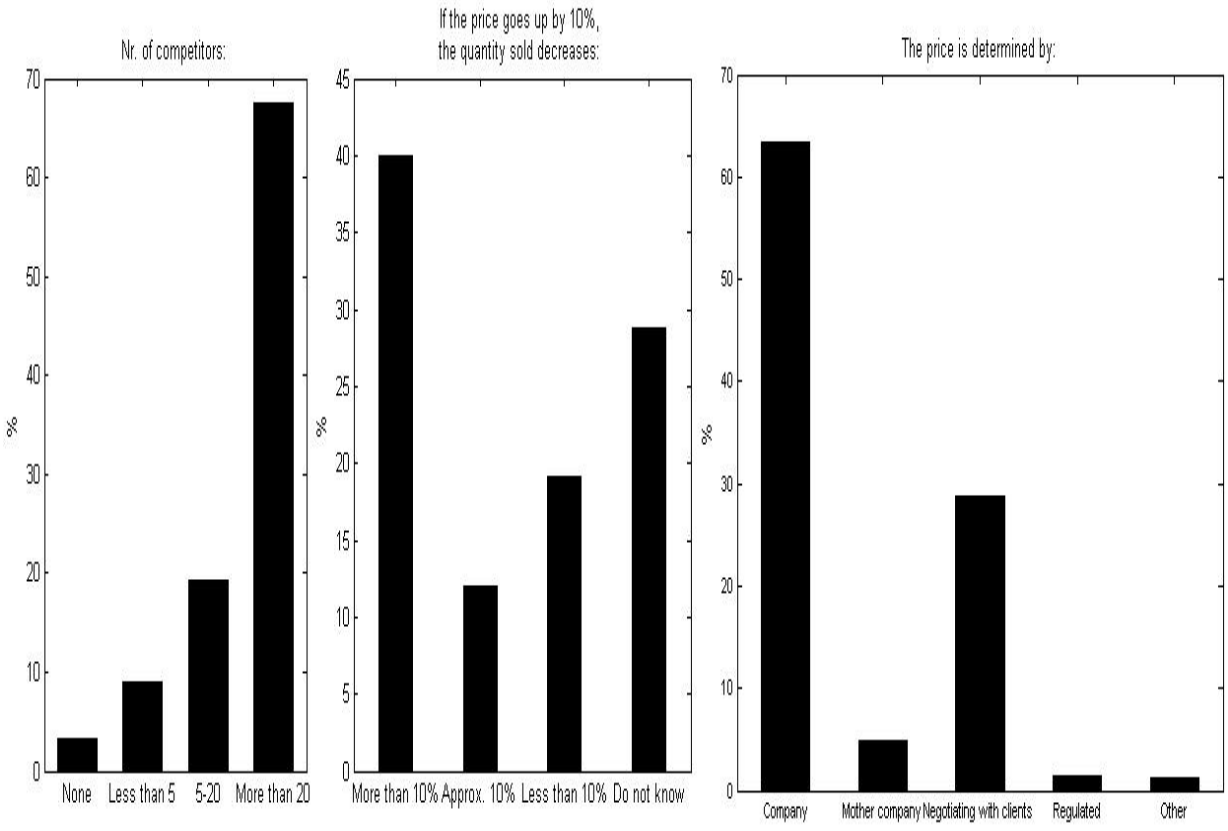
[13] More precisely 47% in the case of Romania, which is similar to that obtained in the case of Portugal. A higher proportion of the turnover generated by exports to EU is also obtained in the similar study for Spain.

Most of the firms (around 71%) have as their main clients other firms, a feature present also in the studies done throughout the IPN network (Fabiani et al., 2005), although in their case there is a predominance of the industrial sector in the national samples, which is not our case. An implication of the fact that population represents the main customer base for only 27% of firms is that inferences drawn from the survey answers should be viewed as referring to price-setting behavior in the whole economy and not specifically in the more inflation-relevant, consumer goods sector.

3.2. Perceived competition

The degree of competition firms perceive is an important variable in the price setting process. The more competitive the market, the higher the probability of firms setting their prices close to the marginal cost. There were several questions trying to assess Romanian companies' perceived degree of competition either directly or indirectly[14].

Figure 2: Perceived competition



[14] However, as is the case in the studies conducted under the IPN framework, the answers to these questions are not fully consistent. For example, the answers to the question regarding the market share (question A.6) were not consistent with other ones trying to assess the degree of competition. This might be the result of poor knowledge of the whole Romanian market, some firms choosing a very narrow identification of their competitor base, e.g. only local competitors.

Question A.5 asked the firms about the perceived number of competitors in the Romanian market. *Ceteris paribus*, the higher this number, the higher should be the degree of competition implied. 67% of the firms perceive that they have more than 20 competitors in the Romanian market, with the percentage being higher for small firms (72%). Only 12% of the firms perceive that they have fewer than 5 competitors for the whole sample, but almost half of these are medium and large firms. Comparing the answers to this question with those from the IPN studies, it seems that firms in Romania perceive to face more competition than those in most of the surveyed EMU countries. However, this can also be the result of the relative bias most IPN samples display in favor of larger firms than our case. A closer distribution of competitor numbers to our own is obtained in the case of Portugal, where 56% of firms declared to have more than 20 competitors (i.e. 5% market share) in their main market.

A relatively high degree of competition is confirmed by question B.11, which concerned the perceived elasticity of demand to a 10% price increase. Forty percent[15] of firms estimated that the quantity sold would go down by more than 10%, 12% indicated a unit elasticity and 19% a below unit elasticity. Almost 29% of the respondents did not answer this question[16]. The highest percentage of firms reporting an above unit price elasticity was recorded in the agricultural sector, while the lowest percentage, across size, was displayed by large firms.

Still related to the competitive environment, question B.1 asked firms who sets the price of the main product. Despite the high degree of perceived competition suggested by the answers to question A.5, 63% of the firms declared to have full autonomy in setting their price, a situation which is similar to that obtained for Portugal and Spain[17]. The pricing autonomy percentages are the highest in the wholesale and retail trade sector and are below average for large firms (consistent with such firms having mostly corporate customers with which they have a stable relationship, see below). Main customers "setting directly" the prices of their suppliers rank second with a percentage of 29% of all firms, a proportion which is higher than the ones obtained in other studies and is mainly due to sectors such as agriculture and transport and communications.

Overall, one can conclude that Romanian firms operate in a competitive environment, which they *relatively perceive* stronger than their EU counterparts (all related answers are reported in Table A.3 in the Appendix). This finding is further supported by the importance that firms attach to competitors' prices when setting their own, an aspect investigated in section 5 below. As a matter of fact, the answers to the latter question are the ones deemed as decisive in assessing the degree of competition in similar studies (e.g. Spain), due to the diverging information resulting from other questions.

Also looking at Table A.3, one can observe that across big NACE groups, perceived competition is higher in manufacturing (big NACE 2) when compared to wholesale and retail sectors (big NACE 5), the two groups accounting for most of the firms in the sample. Furthermore, the degree of competition is higher for small firms when compared

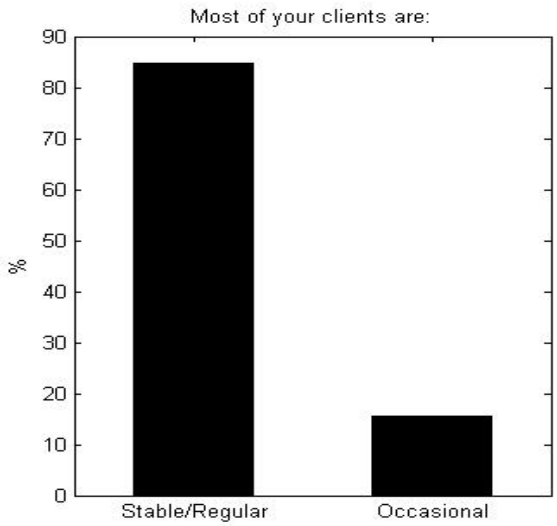
[15] The similar number for Portugal is 67% (Martins, 2005).
[16] This is a low figure since for a similar question only around half of the firms answered in Italy (Fabiani et al., 2004) and none in Belgium (Aucremanne and Druant, 2005).
[17] In their case, the proportion of firms having an autonomous pricing policy is even higher, around 80%.

to large ones. The latter finding is a distinctively different result from that reported by Fabiani et al (2005) for the EMU countries surveyed under IPN, where the degree of perceived competition is directly proportional with the size of the firm. One possible explanation could be that, on the one hand, EMU integration has spurred higher competition for large firms, as cross-border expansions of business has become less costly (in other words national monopolies and oligopolies have become less relevant in a Common Market context). On the other hand, smaller firms in the EMU may have adopted more client-oriented strategies in order to survive in the market, such as product customization and niche specialization, thus managing to avert some of the direct competition they used to face. Finally, the difference between Romania and IPN countries may be artificially induced by the fact that in part of the IPN surveys the starting cutoff for firm selection is higher than ours.

3.3. Long-term vs. occasional relations with customers

Firms were also asked whether their customers are regular or occasional. The existence of stable relationships might impede the price adjustment in the face of a shock. The answers are in line with those in most surveys realized under IPN. Namely, in our case, 85% of the firms considered that most clients are stable[18]. Across firm size, larger firms indicate that all their clients are regular while the proportion is slightly lower than the overall average for small firms. The results for large firms are in line with the findings that foreign firms and other large Romanian companies are their main clients and the high role that these (clients) have in the price-setting process. Furthermore, these answers (stable and regular relationships and prevalence of firms as main clients) suggest an important role contracts - both formal and informal - could have in providing incentives for firms to keep prices fixed, an aspect documented in section 5.

Figure 3: Long versus short relations

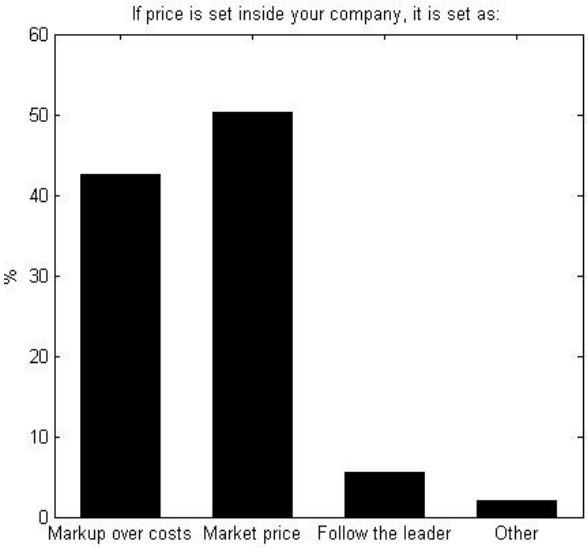


[18] In the constructions (NACE 4) and wholesale and retail trade sectors (NACE 5) this share is slightly lower but still predominant, while for firms in the energy sector (NACE 3) all clients are stable, reflecting the contractual nature of energy provision.

4. Price setting behavior

4.1. How is the price set?

Figure 4: The way the price is set inside the company



For the 63.4% of firms which set the price on their own, question B.2 tried to capture the way the price is formed. Forty-three percent of these firms set their price as a markup over costs, a low figure when compared with similar estimates from other areas (for example US, EMU[19]). Instead, half of the firms are adopting the market price, which is consistent with our previous finding that most firms are operating in a relatively competitive environment.

Across big NACE groups, markup over costs is a dominant strategy only for firms in the manufacturing sector, with 46% of the firms in this sector following such a pricing strategy[20]. Medium-sized and especially large firms[21] that establish the price of the product inside the company adopt a markup pricing strategy, while for small firms, the market price is dominant. This pattern is consistent with the earlier results on perceived competition, and the relatively higher occurrence of long-term relations with customers for medium and large firms when compared with smaller ones.

This result is also in line with traditional theory, as larger firms, having full autonomy over their price setting process and operating in a close to monopolistic market, would tend to have a higher probability of choosing markup pricing when compared with smaller firms. The opposite is reported by Fabiani et al. (2005) for the EMU countries in which similar surveys have been carried out. In most of such countries, smaller firms adopt markup pricing in higher proportion than larger ones. This remains however correlated with the degree of perceived competition, since, as mentioned, EMU large firms face a more competitive market as small ones.

Price discrimination can represent an additional feature of the price setting process for a specific firm in order for the firm to extract a higher consumer surplus.

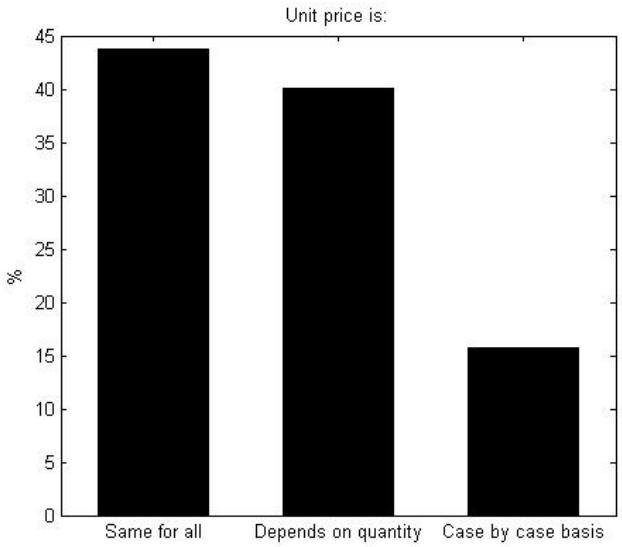
[19] Except France (Loupias and Ricart, 2004).

[20] It should be mentioned that no firms from the electricity, water supply and gas sector (the big NACE 3 sector) answered this question, since for 88% of these the price is regulated, while the customers set the price for the rest.

[21] 74 of the large firms qualifying for question B.2 indicated the adoption of markup pricing.

Only 44% of the firms declared that they charge the same price for all customers. This figure might seem low at first glance, but when compared with similar figures from other studies, it is in fact relatively high. Loupias and Ricart (2004) report that only 19% of French firms charge the same price for all customers, while for Portugal the reported figure is 23% (Martins, 2005). In our sample, 40% of companies discriminate according to the quantity sold and the rest decide the price on a case by case basis.

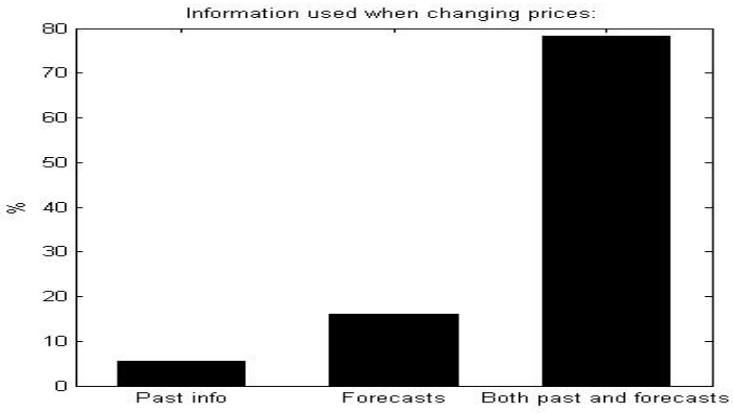
Figure 5: Price discrimination



Across big NACE codes, no discrimination is the rule in the case of energy, gas and water supply (NACE 3), constructions (NACE 4) and wholesale and retail trade (NACE 5) sectors, the latter one being consistent with the finding for Euro area countries (Fabiani et al., 2005). Price discrimination according to the quantity sold is higher for large firms (54%), while small firms discriminate less than the medium and larger ones (47% charge the same price). The latter fact might reflect the higher degree of competition perceived by small firms.

4.2. Information used in price setting processes

Figure 6: Information used in price setting process



The New Keynesian literature stresses the importance of forward-looking factors in modeling macroeconomic variables such as inflation. While purely forward-looking Phillips curves are rarely used in forecasting models[22], the most widespread specification has become that of a hybrid Phillips curve, such as the ones proposed by Fuhrer (1997)

[22] Gali and Getler (1999) argue that the main difficulty of fitting the data with a purely forward-looking New-Keynesian Phillips Curve comes from the use of the output gap as a proxy for real marginal cost.

or Smets (2003). Our results seem to support such a specification, since only 6% of the firms claim to use exclusively past information when setting their prices and only 16% use forecasts alone, while the great majority of firms (78%) use a combination of past information and price projections.

4.3. When are prices changed?

4.3.1. Time-dependent versus state-dependent strategies

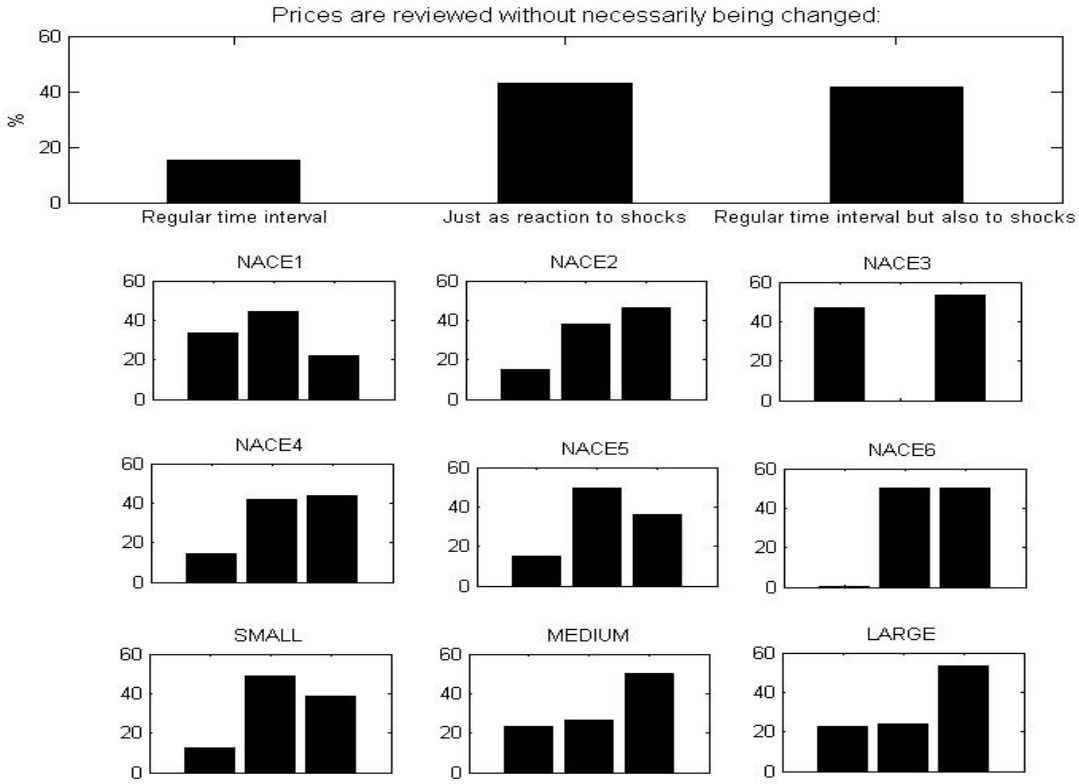
According to the nature of the price adjustment process, two main branches on the literature on price stickiness can be identified, namely one which is based on time-dependent models and the other which involves state-dependent models. Both types of models assume that firms operate in an environment of imperfect competition, that is, they are price setters.

The models that assume that companies follow a time-dependent pricing policy, like the ones developed by Taylor (1977) or Calvo (1983), imply a constant duration of price quotation and synchronized within store price changes. While Taylor assumes that price-setter knows in advance, through contracts, the path of the price adjustment process, in Calvo's model the price is altered only when the firm receives a random signal that follows an exogenously specified distribution. Fischer (1980) instead assumes that prices are predetermined but not fixed; different prices for each period are possible when multi-period contracts are established. The main advantage of time-dependent models of price adjustment is the analytic tractability that allows the analysis of aggregate dynamics. However, their major drawback is that firms are assumed to be unable to respond to shocks that occur in the intervals between two consecutive price adjustment moments.

By contrast, in state-dependent pricing models, prices are not fixed at any moment in time between exogenous fixed periods of adjustment. Prices are fixed only as long as they are not driven too far from the optimal one. Moreover, firms are allowed to respond to shocks. As pioneered by Sheshinski and Weiss (1977, 1992), the optimal policy for stores facing a fixed cost of price adjustment is one of (S,s) type, in which firms change the nominal price in a discrete manner each time the real price falls below a predetermined level *s* so that to attain a real price *S*. The frequency of price adjustments in these models is therefore random. It should be also mentioned that the expected inflation rate is an important determinant in choosing the target and threshold prices.

In order to test which of these theories seems to be closer to Romanian firms' practice, the subjects of our survey were asked if their prices are reviewed - without necessarily being changed – (i) at regular time intervals, (ii) just as a reaction to shocks (e.g. fluctuations in demand), or (iii) usually at fixed periods but also in reaction to certain events.

Figure 7: Time versus state dependent pricing



The answers revealed that approximately 15% of the firms appear to follow a purely time-dependent rule, 43% follow a purely state-dependent rule, while the rest employs a mixed strategy. Time-dependent pricing is above average in the case of firms from agriculture (NACE 1-34%) and energy, gas and water supply (NACE 3-47%), which can be explained by the seasonal pattern of prices, in the case of the former and regulatory guidelines, in the case of the latter[23]. Small firms follow mostly state-dependent strategies, while for medium and large firms the mixed strategy is the most preferred one. For the latter firms the proportion of those preferring a time-dependent policy is slightly above the sample average, which is consistent with the IPN data, where the preference for time-dependent pricing is directly proportional to firm-size (see Fabiani et al., 2005).

Overall, the share of firms choosing a time-dependent strategy alone is smaller when compared with the average for the US (40%, Blinder et al., 1998), the UK (79%, Hall et al., 1997) and the euro area (34%, Fabiani et al., 2005), but there some similarities to the results obtained in the case of individual countries such as Belgium (26%, Aucremanne and Druant, 2005) and Sweden (23%, Apel et al., 2005).

[23] A similar pattern is obtained in the case of Spain (see Alvarez and Hernando, 2005).

4.3.2. Frequency of price revisions/changes

Firms were asked the number of price revisions and the number of price changes for the year 2005[24]. All firms were asked these questions, but the main focus was on firms which indicated to follow time-dependent and/or mixed pricing rules. This is also related to the fact that, when asked if there is a specific month when the price is changed, only firms with time-dependent and mixed rules completed the answers. Table 4 reports the results concerning the frequency of price revisions and price changes.

Table 4: Frequency of price revisions/changes

	Total	NACE1	NACE2	NACE3	NACE4	NACE5	NACE6	Small	Medium	Large
Number of:										
Price reviews in 2005	4.82	6.62	4.16	2.49	4.28	5.96	3.27	4.65	4.55	8.86
Price changes in 2005	2.96	2.71	2.28	2.21	2.52	4.25	1.62	2.99	2.3	5.18
Price reviews in 2005 conditional on time&mixed dependent pricing rules	4.42	5.55	4.71	2.49	3.2	4.58	3.43	3.91	4.67	8.93
Price changes in 2005 conditional on time&mixed dependent pricing rules[25]	2.47	1.97	2.48	2.21	2.32	2.8	1.59	2.3	2.17	5.5

Several observations emerge:

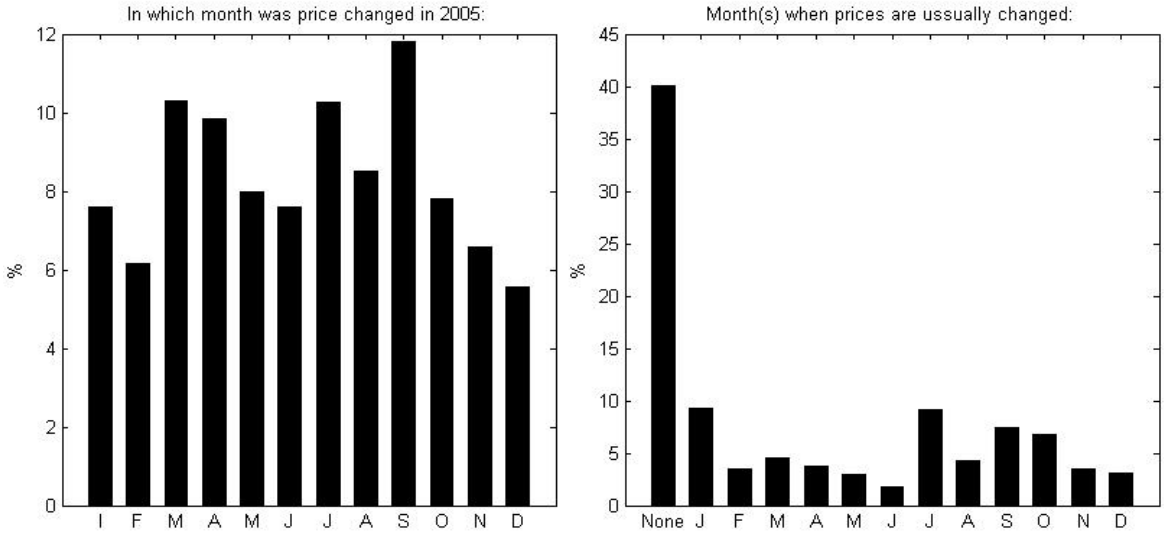
- The results indicate that the degree of price stickiness is much lower when compared with the aggregated results obtained for all the Eurosystem countries in which similar surveyed were done, where the median frequency of price changes/reviews is around once per year[26] (Fabiani et al., 2005). This is not a big surprise considering the history of high inflation in Romania, with the average inflation falling to a single–digit level as late as 2005[27]. On average, firms that follow a strategy with time-dependent elements reviewed their prices circa 4.4 times per year (that is approximately once every 2.7 months) and they changed their prices about 2.5 times per year (that is on average every 5 months). Price reviews were thus taking place more often than price changes, roughly in a two to one ratio for most firms, with the exception of the energy, water and gas sector where the frequencies of reviews and changes are equal, due to regulatory requirements.
- Large firms reviewed their prices much more often than medium or small ones. This might be the result of a stronger concern regarding costs of mispricing, a

[24] A specific year was also asked in the surveys conducted in Italy, France and Portugal.
[25] Grouping these two options togheter was based on the procedure followed in similar studies. However, one could argue that the mixed strategy is closer to the state-dependent case.
[26] Although there are countries where price reviews are taking place quarterly like Austria, France or Nederlands (Fabiani et al.).
[27] The current phase of the disinflation process in the post-communist period is considered to have started in the second part of the year 2000, when inflation stood at around 40-45%.

higher diversity of their products and the larger resources at their disposal[28], as well as the lower degree of competition perceived.

- The average number of price reviews and changes for all firms in the sample is slightly higher than the similar measure computed only for firms which indicated to follow a time or a mixed-dependent pricing strategy.
- When asked about the month(s) when prices were changed in 2005, no significant spikes were observed in the answers, with the exception of agricultural (NACE 1) and public utility companies (NACE 2), which displayed spikes in the third and second quarters respectively.
- Furthermore, firms that followed a price setting strategy incorporating a time-dependent pattern were asked if, *in general* there are specific months when the price is changed. Surprisingly, almost 40% indicated that there is no such month. This can be reconciled with the strategy followed if the decision is taken for example in a certain quarter and not a specific month. Among those indicating a specific month, the distribution is quite uniform with some minor spikes in January, July, September and October.

Figure 8: Monthly distribution of price changes



Besides the frequency of price reviews and price changes, firms were also asked to indicate the magnitude of a typical price increase/decrease in 2005. The answers to this question suggest a certain asymmetry between price increases and price decreases, with the former being more evenly distributed between the 0-4% and the 4-8% brackets (38%-38%), while the latter are obviously skewed towards the 0-4% interval (55% for price decreases of these magnitudes and 29% for price decreases between 4% and 8%)[29]. This

[28] Although survey respondents were asked to refer in their answers to their main product, the existence of a high variety of different products makes it more likely in the case of large firms that they would employ a specialized workforce which would monitor, review and propose price changes at regular time intervals .

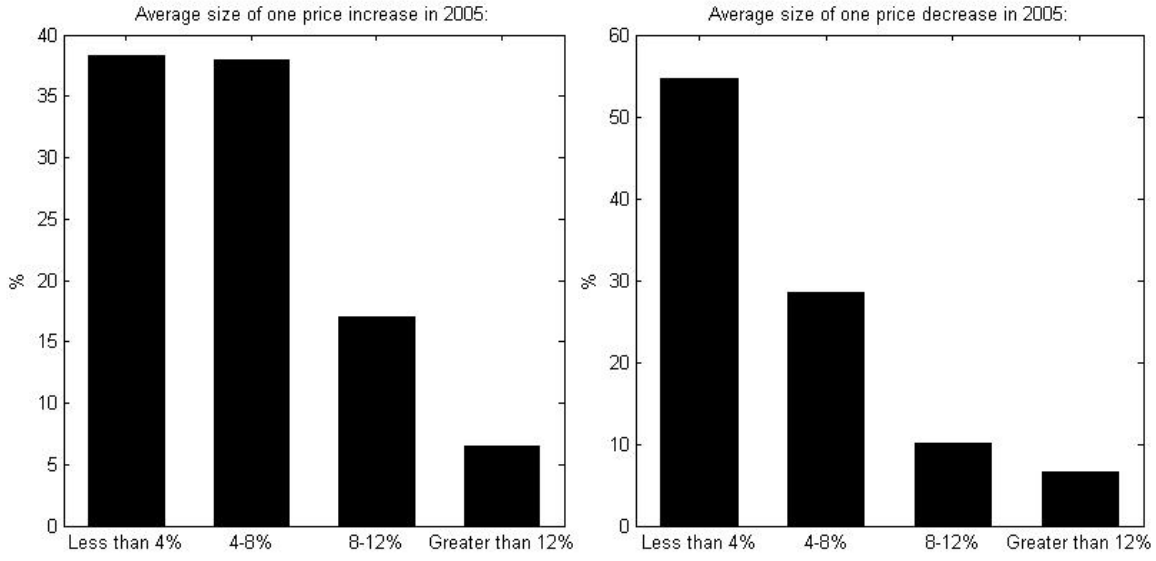
[29] Price increases also displayed a more significant proportion of answers for the 8-12% bracket (around 17%) as opposed to price decreases (around 10%).

type of asymmetry is also manifest with respect to the direction of price changes (there were only 286 answers for the magnitude of a typical price increases and 129 answers for the magnitude of a typical price decrease). While the prevalence of upward price changes is to be expected in a moderate-to-high inflation environment, one may also emphasize the role of the higher frequency and magnitude of upward price shocks in 2005: administered price and excise tax hikes in April, bad agricultural crops due to two rounds of floods, large upswings of the international oil price and the positive demand shock due to the introduction of a flat income tax rate of 16%.

The highest proportion of large price increases, (i.e. larger than 12%) were obtained for firms in the public utilities sector (electricity, gas and water supply, NACE 3 sector). Together with the data on price change frequencies for this sector, this comes to confirm the intuition that regulated prices are modified less often than market prices, but when they are, they tend to come in relatively large shocks[30]. Given that such "unpopular" shocks are seldom pre-announced by governmental policy makers for obvious reasons, this type of behavior creates significant difficulties for an inflation targeting central bank both to properly forecast inflation developments and to come up with the proper monetary policy response in order to keep inflation close to the target.

As for the largest (>12%) price decreases, these are mostly characteristic of firms in the agricultural sector. This again is an intuitive result, since food prices (especially fruit and vegetables) are known to be have a strong seasonal pattern, with large price discounts recorded in the third quarter of every year.

Figure 9: Size of price changes



[30] Large administered price changes in the runup to EU membership were partly connected with regulatory changes meant to eliminate subsidies in some sectors and to align some prices (e.g. natural gas) and taxes (e.g. for fuels, tobacco and alcohol) to the levels imposed by EU directives.

5. Determinants of price changes and causes of price stickiness

Section C of the questionnaire was designed to obtain information on the determinants of price changes and the main causes of price stickiness.

5.1. Determinants of price changes

As for the question of the main determinants of price changes (question C1), respondents were asked to assess on a scale from 1(not important) to 4(very important) the importance of each of a list of underlying factors, separately for price increases and for price decreases. The factors considered were similar to those used in similar studies (see Table 5 below), except that we included as additional determinants exchange rate fluctuations and the inflation rate. The reason is linked to the historical pattern of some Romanian firms' automatically indexing their prices to the exchange rate or to past or anticipated inflation rates, which in itself represents a characteristic of price setting behavior in countries with a high inflation environment.

Although the actual average scores have different magnitudes, our factor rankings look rather similar to those reported by Fabiani et al. (2005) for the euro area average. Thus, in both cases the changes in the cost of raw materials and those in labor costs are at the top of the drivers of price increases and the changes in competitors' prices, those in raw material costs and the fluctuations in demand lead the hierarchy of price decrease determinants[31]. Furthermore, the asymmetry between the causal factors of positive and negative price changes shows similar patterns to the IPN results, with supply side factors being more relevant for price increases and less so for price decreases, while the reverse is true about demand side factors.

The gap between raw material costs (scoring 3.4) and labor costs (scoring almost 3) at the top of price increasing factors is large, probably reflecting a relatively lower correlation between price and wage dynamics, to the extent that the latter are better correlated with productivity growth, as suggested by the answers to our question on the determinants of wage dynamics in section 6 below. Although ranking in the second half of the factors explaining price surges, exchange rate movements and the inflation rate still play a relatively important role in Romanian firms' price setting, despite the faster disinflation and the significant currency appreciation of the recent years, compared with financial costs which received little importance.

[31] Raw materials costs are the most important factor in determining price increases across all sectors considered, while for price decreases, demand changes factor are equally as important as raw material costs for agricultural firms and as competitors' prices for manufacturing firms. There are no significant differences compared with the overall answers when results are considered according to firm size.

Table 5: Most important factors for a price increase/decrease decision*

PRICE INCREASES			PRICE DECREASES		
Factor	***Mean***	***P-value*** **	***Factor***	***Mean***	***P-value*** **
Raw materials	**3.40**	0	**Competitors' price**	**3.15**	0.85
Labour costs	**2.97**	0.38	**Raw materials**	**3.15**	0.75
Demand changes	**2.91**	0.76	**Demand changes**	**3.11**	0
Competitors' price	**2.91**	0.17	**Exchange rate**	**2.78**	0.68
Exchange rate	**2.83**	0.2	**Labour costs**	**2.75**	0
Inflation rate	**2.72**	0	**Inflation rate**	**2.40**	0.03
Financial costs	**2.35**	0.03	**Seasonal factors**	**2.26**	0.55
Seasonal factors	**2.16**		**Financial costs**	**2.20**	
Other	**2.64**		**Other**	**2.29**	

Note: * - Firms were asked to indicate the importance of each option in a scale ranging from 1 ("not important") to 4 ("very important"). ** - The p-values were computed for testing the hypothesis that the mean of a given theory is the same as that ranked just below with the exception of the "other" option.

5.2. Determinants of price stickiness

Different explanations have been advanced by economists to motivate price stickiness. In the present case, the following seven possible explanations[32] were listed for firms to assess their importance:

1. Explicit contracts – which refers to the idea that, until re-negotiation, firm-client relationships are governed by the constraints imposed by written contracts.
2. Menu costs – which refer here to the narrow sense of the concept, namely that firms tend to keep their prices unchanged because price changes imply physical costs (printing new catalogues, changing the price tags, changing the information posted on their websites etc.). Among the few studies that measure menu costs in this narrow sense directly, the series co-authored by Daniel Levy stand out. Using data coming from a company that sells electronic shelf label systems (ELS), Levy et al. (1997) and Dutta et al. (1999) quantified menu costs for supermarket chains and drugstores. Their results involved magnitudes which exceeded the thresholds put forward by other studies for adjustment costs beyond which a firm would optimally have no incentive to adjust its price[33].

[32] The choice was done by investigating similar studies and eliminating some explanations which were innapropriate (e.g. the pricing points theory could not be applied due to the denomination of the Romanian currency which took place at 1st of July 2005). The way the questions were formulated was more detailed as one can observe in the Questionnaire presented in the Appendix B of the current paper.

[33] For example, according to the model of Blanchard and Kiyotaki (1987), price adjustment costs of 0.08 percent of revenues are enough to prevent price adjustments from taking place. Levy et al. (1997) and Dutta

3. Information and decision costs – are based on the idea that acquiring information for the decision making process is costly to the firm, generating lumpy price behavior. This concept is part of a broader understanding of menu costs, as pointed out by Ball and Mankiw (1994). They argue that "*menu costs* are a metaphor like *shoe leather costs*", and that the most important part of these costs refer to "the time and attention required of managers to gather the relevant information and make and implement decisions." This is similar to the idea of "decision costs" proposed by Sheshinski and Weiss (1992). Evidence for the importance of decision costs is provided by Zbaracki et al. (2004) who quantify the costs of adjusting prices for an industrial corporation that was observed over a two-year period. While physical costs of price adjustment are found to be quite high, the other two categories (managerial and costumer costs) are shown to have even higher magnitudes. Moreover, soft consumer costs[34], although not quantified, seem to be important as also emphasized by coordination failure theory or by Rotemberg's (2005) concept of "customer anger".
4. Coordination failure theory - according to which firms hesitate to change prices for fear of being the only ones doing so, and, thus, they prefer to wait for others to make the first move. Coordination failure implies a high degree of synchronization in the timing of price changes across vendors.
5. Implicit contract theory - takes into account the existence of an invisible mutual agreement between firms and customers that prevents firms from changing prices. Rotemberg (2005) argues that an extra reason for nominal price rigidities is that some price changes are perceived by consumers as unfair. Firms avoid such changes, giving extra signals on their "loyalty" to customers through periods of stable prices. However, as Kackmeister (2003) documented, there was a decline over time in the seller-buyer relationship. He suggests that there are two parts of this relationship: one personal and the other brought about by business concerns. At the retail level, an increase in the size of stores and more centralized decisions on prices led to the personal part being lost, which generated a decrease in consumers' loyalty (Kackmeister, 2003).
6. Price readjustments - implies that firms are reluctant to change prices in a given direction for fear of having to change it in the opposite direction in a short period of time. This is related to the perceived nature of shocks: temporary shocks induce price stickiness, while permanent ones induce price changes. Borrowing the terminology from the time-dependent models of price stickiness, this factor can also be interpreted as firms' assessment of the strength of the price adjustment "signal".

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et al. (1999) in their turn obtained menu costs representing 0.70 percent of revenues for supermarket chains and 0.59 percent of revenues for drugstores.

[34] Like customer antagonization costs, not quantified in the mentioned study due to measurement difficulties.

7. Quality by price - refers here to the case that a price reduction may signal to consumers a reduction in product quality. Thus firms prefer to keep their nominal prices constant in order to avoid sending the wrong signal about their products' quality.

The answers received to this question indicate that only two of the above factors were regarded as important (scored above 3), namely, the explicit contracts (3.10) and the implicit contracts (3.12). All of the other options received little importance (scored close to 2 or below). These conclusions are similar when one looks across the rankings for NACE groups and firm size, although there are some differences in the magnitude of the average scores[35]. The results are consistent with those showing the dominance of long-term customers in commercial relationships (for 85% of firms) and other firms being the main clients (for around 71% of our survey respondents).

Table 6: Most important factors for price stickiness*

Factor	*Mean*	*P-value***
Implicit contracts	**3.12**	0.97
Explicit contracts	**3.10**	0
Quality adjustments	**2.19**	0.43
Price readjustments	**2.15**	0.02
Coordination failure	**1.97**	0
Information costs	**1.74**	0.01
Menu costs	**1.62**	

Note: * - Firms were asked to indicate the importance of each option in a scale ranging from 1 ("not important") to 4 ("very important"). ** - The p-values were computed for testing the hypothesis that the mean of a given theory is the same as that ranked just below.

All national surveys conducted in the context of the Eurosystem's IPN project included some form of this question in their query. Fabiani et al. (2005), who summarize the results obtained up to the publication date, report that implicit and explicit contracts are ranked first and second across the euro area[36], a result similar with the one obtained in the current study. However, due to the heterogeneity of scores across countries, the average scores for these two theories are lower than the ones reported here. Our score is close in magnitude to that obtained in the case of Austria, as reported by Kwapil et al. (2005), with scores of 3.04 for implicit and 3.02 for explicit contracts theories. These two factors also score well in the studies performed outside the IPN framework. For example, implicit contracts are ranked first in the study of Apel et al. (2005) for Sweden, while explicit contracts lead the way for UK firms as reported by Hall et al. (1997). The exception is the study of Blinder et al. (1998), where implicit contracts are ranked fourth, while the explicit contract theory is ranked fifth[37].

[35] For example, the average score for big firms for the explicit contracts theory is higher than the similar ones for the small and medium firms.
[36] The results reported by Fabiani et al. (2005) are unweighted average of nine countries' scores.
[37] An explanation for the different ranking obtained by Blinder et al. (1998) may be the administration of the questionnaire through direct meetings with the managers of the sampled firms.

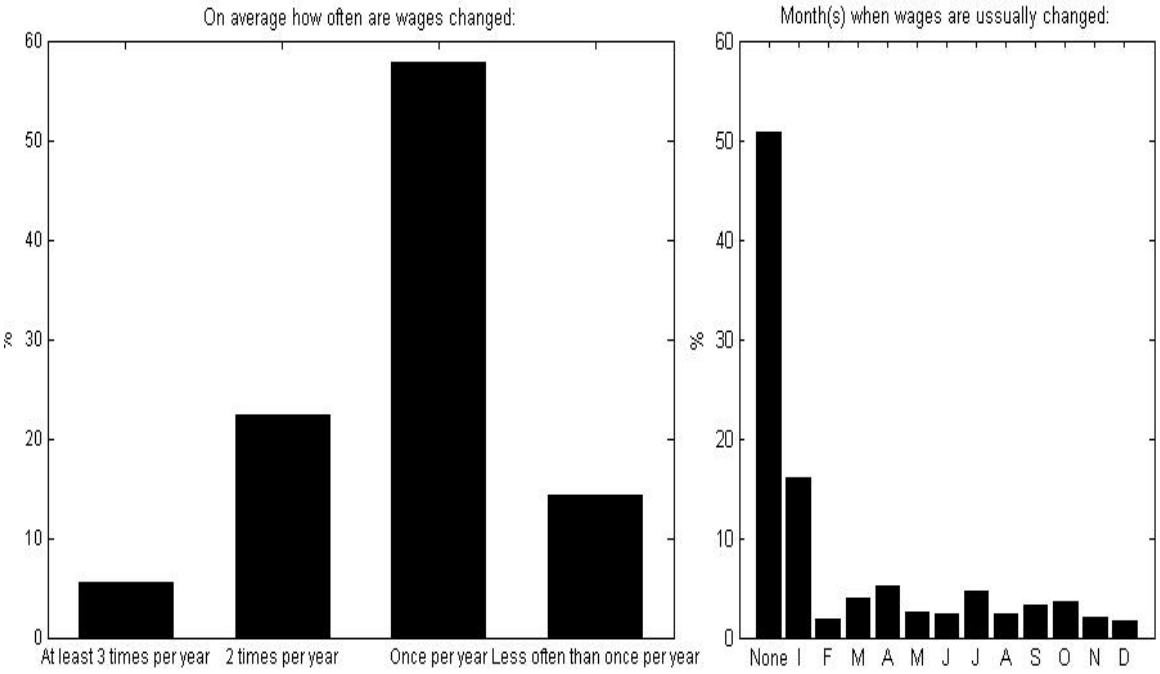
6. Wage setting behavior

Wage setting behavior is an important aspect to consider when assessing the impact of monetary policy on both the real side and the nominal side of the economy. Thus, wage stickiness is often brought up in the context of a New Keynesian model as an explanation of the empirically founded inertia in both inflation (see for example Blanchard and Gali, 2006) and real output (see Christiano et al., 2001).

Our results suggest that in the Romanian case wages are much stickier than prices. According to the answers we received, more than a half (58 %) of the sampled firms generally change their employees' wages only once per year (with a further 14% doing it even less than once a year), while 22% have 2 changes per year and only around 6% of firms change wages more often than 3 times per year.

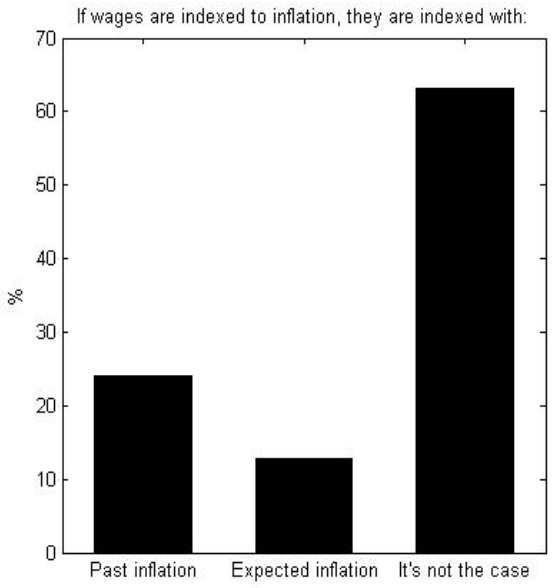
The results are similar when one looks across large NACE groups and firm size, with the exception of the energy, gas and water supply sector (NACE 3 sector) where wages are changed yearly or less frequently, a fact that can be due to both the high regulation and the very short history of private ownership for most of the firms in this sector.

Figure 10: Frequency of wage changes and month(s) they are usually changed



When asked if there are particular month(s) when the wages are changed, 51% of the answers mention that there is no such month. However, in contrast to the similar question on price setting, where the distribution across months was pretty uniform, in the case of wage setting January sticks out as a month preferred for changes in wages by a relative majority of firms (16%, compared to no other month's proportion exceeding 5%). These results are close to the ones obtained for Portugal, where about 56% of the firms change their wages in a particular month, and out of these almost half in January (Martins, 2005).

Figure 11: Adjustment to inflation



In a still relatively high inflationary environment, indexation of wages to inflation is often considered a common practice. This is the topic that question D.2 was designed to investigate. Surprisingly, 63% of the answers indicate that inflation indexation does not take place. Only approximately 24% of firms declared to index wages to past inflation and 13% to the expected inflation level. These results combined with the answers on determinants of wage changes are evidence against the widespread use of wage indexation practices to inflation. This may be a reflection of improving inflation expectations, following an almost uninterrupted trend of disinflation, including last year's reduction of the CPI growth rate from 8.6 to 4.9 percent.

Results across economic sectors are generally similar, but for the agriculture and energy, gas and water supply sectors where inflation indexation (either to past or expected inflation) accounts for more than 50% of the answers. Across firm size, the relevance of inflation indexation seems to be marginally higher only in the case of medium-sized firms.

Firms were also asked about the main factors affecting wage changes. Respondents had to choose from four factors: changes in productivity, inflation variations, changes in taxes and demand fluctuations. Only changes in productivity were considered more than "important" (scored above 3), while the other three factors had average scores around 2.5 (see Table 7 below). The results are generally similar across large NACE groups and firm size.

Table 7: Most important factors for wage changes*

Factor	*Mean*	*P-value***
Productivity	**3.19**	0
Taxes	**2.61**	0.55
Demand	**2.59**	0.19
Inflation	**2.44**	

Note: * - Firms were asked to indicate the importance of each option in a scale ranging from 1 ("not important") to 4 ("very important"). ** - The p-values were computed for testing the hypothesis that the mean of a given theory is the same as that ranked just below.

The correlation of wage dynamics to changes in productivity rather than inflation developments is a positive result for the Romanian economy. It means that if the

currently high productivity growth rates are to be kept up as the Romanian economy continues its catching-up process, this would have beneficial outcomes for all parties involved, due to the "divine" coincidence of high output growth, low inflation and high wage growth.

However, we prefer to take this result with a grain of salt for several reasons. First, a few explaining factors of wage dynamics may have been left out, such as labor market shortages or exchange rate developments (given that some companies negotiate salaries in euro terms), which may have biased to some extent the answers we received. Second, our prior belief that some sort of indexation is still present at firm-level, combined with the low economic sophistication of the whole population, including the business environment, and the lack of experience and/or sufficient instructions of firm officials in responding to survey questions lead us to suspect at least two more possible biases or anomalies related to this question. First, some respondents may have had difficulties in distinguishing between productivity growth (measured in real or output terms) and total or per employee earnings growth (which are measured in nominal terms), thus implicitly including inflation in the answer which should have referred solely to productivity dynamics. Second, some respondents may have viewed the choice of productivity growth as the "right" answer to give, thus perhaps misrepresenting actual firm practices. This might be the case for instance for the public utilities sector, which is still dominated by state-owned enterprises where indexation practices are known to persist (see the above mentioned answers regarding inflation indexing practices for this sector), whereas the distribution of answers we received for this sector is every strongly skewed towards the productivity answer.

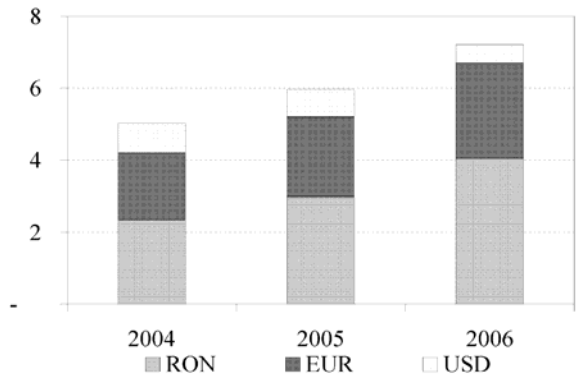
7. Reaction to potential financial shocks

Investigating the reaction of firms to potential financial shocks in a survey form is a new approach introduced by this paper. Firms were confronted with 6 scenarios and asked to assess their importance on their prices and costs:

1. Exchange rate depreciates to 3.9 RON/EUR;
2. Exchange rate depreciates to 4.6 RON/EUR;
3. Exchange rate appreciates to 2.7 RON/EUR;
4. Interest rate to EUR/USD credits increases to 15%;
5. Interest rate to RON credits increases to 20%;
6. Interest rate to RON credits increases to 30%.

At the time the companies received the questionnaire (September – November 2006), the exchange rate was quoted at around 3.5 RON/ 1 EUR and the domestic interest rates for outstanding loans granted to companies was around 13.5 percent for domestic currency loans and 7.2 percent for loans in EUR. Therefore, the scenarios were tailored to count for a shock of approximately 10 or 30 percent RON depreciation (and 20 percent appreciation, respectively) and an almost twofold hike in interest rates (RON or EUR).

Figure 12: Companies debt service (bl. RON)



Source: Financial Stability Report 2007, NBR

We expected firms to be rather resilient in coping with shocks, given (i) the favorable cyclical position of the economy when the survey was conducted (the average real GDP growth rate was 5.5 percent during 2000-2006) and (ii) the continuous improvement of the corporate sector soundness (according figures reported in the *Financial Stability Report - FSR* drafted by the central bank). Consequently, we expected higher and statistically different ranks only for the extreme scenarios.

We also expected the exchange rate shock to rank higher than the interest rate due to the following reasons:

a) Most of the Romanian companies (and 45 percent from the adjusted sample) do not take loans and dispose of important bank liquidities. These firms are net creditors to the banking sector, and a hike in the interest rates might even positively affect them. Overall, the Romanian firms rely to a great extent on internal resources and on trade credit to finance their activities and much less on resources borrowed from financial institutions (FSR, 2006). This is also reflected by the relatively humble (when compared to other countries) level of financial intermediation[38].

b) The share of foreign currency loans (domestic and external) in total loans granted to firms is quite important in the case of Romania (64% in December 2006). It is also true that many companies are naturally hedged against the exchange rate risk, but the value of the hedging is rather low (the net export flows of the initial population cover only 10% of the interest rate costs with loans in foreign currency, FSR 2007). On the other hand, Figure 12 reflects an increasingly higher debt service for RON loans compared to EUR or USD loans, suggesting a growing importance of domestic interest rate shocks.

c) The nominal interest rate is only a part of the effective cost of financing through bank credit. The share of non-interest rate expenditures of a loan (e.g. fees and commissions) can be quite important in the Romanian banks' case, but changes in the levels of such expenditures are not entirely captured by a nominal interest rate hike.

d) Preliminary information from the earlier questions in the survey showed that while both exchange rate movements and financial costs factors ranked below most factors listed for the explanation of price changes, the average scores were

[38] The non-government credit to GDP ratio was 21.1% in 2005 and 27.2% 2006, while the similar ratios for the euro area countries have been consistently larger than 100%.

statistically higher in the case of exchange rate movements as compared with financial costs, for both price decreases and increases.

The number of answers received for this section of the survey is lower than for most other questions. This might be due to the high degree of complexity and analysis the answers to this section entail. The results are presented in the tables 8 and 9 below.

Table 8: Impact of potential shocks on prices*

Scenario	*Mean*	*P-value***
Exchange rate depreciates to 4.6 RON/EUR	**3.6**	0
Exchange rate appreciates to 2.7 RON/EUR	**3.19**	0.21
Interest rate to RON credits increases to 30%	**3.09**	0.12
Exchange rate depreciates to 3.9 RON/EUR	**2.97**	0.12
Interest rate to RON credits increases to 20%	**2.83**	0
Interest rate to EUR/USD credits increases to 15%	**2.6**	

Note: * - Firms were asked to indicate the importance of each option in a scale ranging from 1 ("not important") to 4 ("very important"). ** - The p-values were computed for testing the hypothesis that the mean of a given theory is the same as that ranked just below.

Table 9: Impact of potential shocks on costs*

Scenario	*Mean*	*P-value***
Exchange rate depreciates to 4.6 RON/EUR	**3.59**	0
Exchange rate appreciates to 2.7 RON/EUR	**3.05**	0.73
Interest rate to RON credits increases to 30%	**3.05**	0.35
Exchange rate depreciates to 3.9 RON/EUR	**2.97**	0.23
Interest rate to RON credits increases to 20%	**2.85**	0.04
Interest rate to EUR/USD credits increases to 15%	**2.62**	

Note: * - Firms were asked to indicate the importance of each option in a scale ranging from 1 ("not important") to 4 ("very important"). ** - The p-values were computed for testing the hypothesis that the mean of a given theory is the same as that ranked just below.

Several observations are worth mentioning:

a) Strong potential exchange rate movements generally receive a higher overall average score than the scenarios looking at interest rate movements. This validates our above mentioned expectation. However, only the leading scenario (exchange rate depreciation to 4.6 RON/EUR) and the one having the lowest average score (an increase of interest rate to EUR/USD credits to 15%) are statistically different from the one below (above), both when the impact on prices and that on costs are considered. The overall average scores are high, reflecting the shock potential these scenarios have.

b) The price and cost impacts are similar (from a statistical point of view) for all scenarios but that assuming an exchange rate appreciation to 2.7 RON/EUR. Thus, one might argue that, except for this scenario, firms fully transmit into their prices the impact of shocks. In a model where firms keep their prices stable because they are concerned about losing customers or market share (an important factor for the sampled firms considering the high ranking “implicit contracts” received among price stickiness factors), Kleshchelski and Vincent (2007) show that shocks affecting the marginal cost of a single firm have a lower pass-through to prices than in the case when an entire sector is hit (24% in the former case and 62% in the latter). If one considers that the shocks that

we listed in our questions usually affect all sectors, the high average scores obtained make logical sense.

c) Large companies register higher scores in case of a sudden move in EUR/RON exchange rate. An explanation might be that according to their balance sheet data, these companies bear almost 60% of the total unhedged foreign exchange risk belonging to the Romanian corporate sector.. Small firms in their turn rank higher the importance of the scenario of the interest rate to RON loans soaring at 30%. This might be due to the large and increasing position of SMEs as net debtors to the banking sector (amounting to 15% of the their total balance sheet, as compared with the SMEs from the euro area which currently retain a net debtor position of only 2-3%).

8. Behavior on international markets

The last section of the questionnaire was meant to investigate the behavior on international markets of firms having exports that exceed 20% of their turnover. Thus, this question addressed only a sub-sample of the firms answering the survey and results should be interpreted with caution. For these firms, we tried to assess the existence of price discrimination across markets. Exchange rate fluctuations and fluctuations in country demand are ranked first, with overall average scores of 3.29 and 3.19 followed by transportation costs, market characteristics and the tax system of the destination country[39].

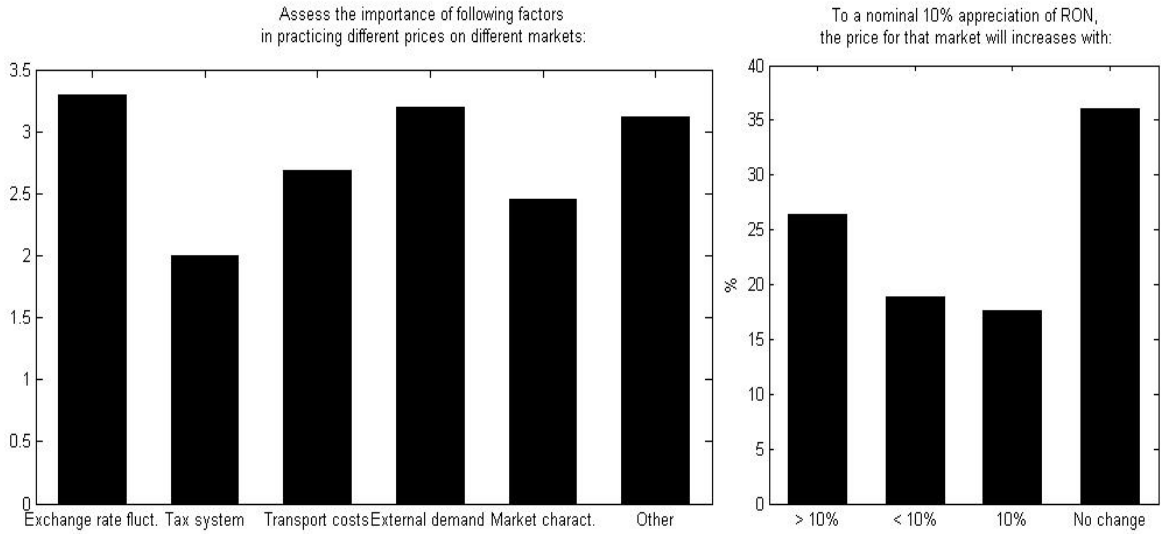
When compared with the results obtained in the studies carried out under the Eurosystem IPN[40], the results are similar for common factors[41]. For example, demand fluctuations and transportation costs score high in both IPN projects and our study, although the order is reversed (Fabiani et al., 2005). However, some differences remain. For example, in the present study exchange rates movements (e.g. RON/country of destination currency) are ranked first, while in the study of Martins (2005) for Portugal they are ranked at the bottom of the list with only the country's tax system having a lower score[42]. This latter factor scores worst also here. The last two results might be explained by the orientation of the Romanian exports towards EU in a high proportion combined with the strong nominal and real appreciation of the Romanian currency against the euro in the recent years and harmonization of the tax system according to EU standards in the light of the January 2007 accession.

Finally, the firms were asked how they would change the price on the export market if the national currency were to appreciate by 10% against the currency of the exporting country. The price would increase by 10% or more for approximately 44% of the firms

[39] The average scores for these options, in the order presented in the text, were following: 2.68, 2.45, and 2.00. The "other" option had an average score of 3.12 but the number of answers was very low.
[40] The national studies that included similar questions were the ones for Belgium, Luxemburg, Portugal and Spain (Fabiani et al., 2005).
[41] Fluctuations in the price of competitors in the irrespective markets were not taken into account in the current study, as it was the case of the studies for Belgium, Luxemburg and Spain.
[42] For Portugal, only exports outside the euro area were considered.

while for the rest the price would increase by less or would not change (36% of the firms would not change the price at all).

Figure 13: Exporting firms' behavior



These answers show the existence of some "pricing to market" strategy, as well as some possible "hedging by quality improvement" of Romanian exporters, based on the existing evidence that export value added has increased steadily in the last couple of years. However, as some answers mentioned the impossibility to change the price, it might also suggest the enforced contractual nature of commercial relationships. In the latter case, firms would need to develop hedging strategies to protect themselves against the appreciation of the domestic currency.

9. Conclusions

The paper presents the results of a survey on price setting behavior of Romanian firms carried out in the fourth quarter of 2006. The survey is similar to those employed by the Eurosystem in its "Inflation Persistence Network" project. The complexity of our questionnaire is nevertheless higher than most of those used in the case of IPN studies, especially considering Romanian companies' lack of experience with similar surveys. Probably related to this, the answer rate of our survey is about half that of the average registered for the IPN studies.

The main conclusions drawn from the analysis of the responses to the questionnaire are the following:

- Romanian firms perceive the environment they operate in as more competitive than the firms surveyed in the IPN project. This is mainly due,on the one hand, to

small firms having a more prominent role in our sample and, on the other hand, to those same firms facing more fierce competition when compared to large firms, as opposed to the situation reflected in the IPN surveys, where large firms display a more competition-constrained behavior.

- Most of the firms claim to have full autonomy in setting the price. Among these, around half use the market price as the main pricing rule, with a slightly lower share of firms setting the price as a mark-up over costs. These results are due to the predominance of market price adoption by small firms, while medium and large firms use mostly mark-up pricing, which is consistent with the degree of competition they perceive.
- Relations with the customers are long-term oriented, the main clients of firms being other firms.
- The large majority of firms use a combination of backward and forward-looking information when reviewing prices. Around 60% of firms use either a time-dependent pricing rule or one that incorporates both time-dependent and state-dependent elements. Pure state-dependent pricing is dominant only in the case of small firms.
- Romanian firms revised and changed their prices in 2005 much more frequently than what the reports summarized in Fabiani et al. (2005) suggest is usually the case for euro zone firms. Conditional on following a time and mixed-dependent pricing rule, Romanian prices were revised almost quarterly, the average duration being around 5 months. Large firms revised and changed their price much more often than the medium and small ones, probably due to more significant costs of mis-pricing their products and lower costs of price optimization.
- Costs of raw materials in the case of price increases and competitors' price, raw materials costs and demand changes in case of price decreases are the main factors determining price changes. When it comes to the main causes of price stickiness (although when observed this is relatively low), implicit and explicit contracts rank first. This is broadly similar with the rankings obtained for EMU countries.
- Wages are stickier than prices. Around 72% of firms change their wages once per year or less often, the most important factor leading to wage variations being the change in productivity.
- Firms usually fully transmit into their prices the full impact of strong unanticipated financial shocks. Strong variations of the exchange rate are typically perceived more strongly than interest rate shocks.

At this stage, further analysis should be carried out in at least two directions: first, to augment the current analysis by investigating detailed balance sheet, foreign trade and bank exposure data and second, to complement this analysis with researching the micro data used for CPI compilation, an approach also employed under the "European Inflation Persistence Network" in the cases where the data could be obtained.

References

Álvarez, Luis J., Dhyne, Emmanuel, Hoeberichts, Marco M., Kwapil, Claudia, Le Bihan, Herve, Lünnemann, Patrick, Martins, Fernando, Sabbatini, Roberto, Stahl, Harald, Vermeulen, Philip, Vilmunen, Jouko, 2005. Sticky Prices in The Euro Area: A Summary Of New Micro Evidence. Working Paper No. 563. European Central Bank.

Álvarez, Luis J., Hernando, Ignacio, 2005. Price Setting Behavior of Spanish Firms: Evidence from Survey data. Working Paper No. 538. European Central Bank.

Apel, Mikael, Friberg, Richard, Hallsten, Kerstin, 2005. Micro foundations of macroeconomic price adjustment: survey evidence from Swedish firms. Journal of Money, Credit, and Banking 37(2), 313-338.

Aucremanne, Luc, Dhyne, Emmanuel, 2004. How Frequently Do Prices Change? Evidence Based on the Micro Data Underlying the Belgian CPI. Working Paper No. 331. European Central Bank.

Aucremanne, Luc, Druant, Martine, 2005. Price-Setting Behavior in Belgium: What can Be Learned from an ad hoc Survey?. Working Paper No. 448. European Central Bank.

Ball, Laurence, Mankiw, Gregory N., 1994. A Sticky-Price Manifesto. Carnegie-Rochester Conference Series on Public Policy, Vol. 41. pp. 127–151.

Bils, Mark, Klenow, Peter J., 2002. Some Evidence on the Importance of Sticky Prices. Working Paper No. 9069. National Bureau of Economic Research.

Blanchard, Olivier J., Kiyotaki, Nobuhiro, 1987. Monopolistic Competition and the Effects of Aggregate Demand. American Economic Review 77(4), 647-666.

Blinder, Alan S., 1991. Why Are Prices Sticky? Preliminary Results from an Interview Study. American Economic Review 81(2), 89-100.

Blinder, Alan S., Canetti, Elie R.D., Lebow, David E., Rudd, Jeremy B., 1998. Asking about prices: a new approach to understanding price stickiness. Russell Sage Foundation, New York.

Calvo, Guillermo A., 1983. Staggered Pricing in a Utility Maximizing Framework, Journal of Monetary Economics 12, 383-398.

Christiano, Lawrence J., Eichenbaum, Martin, Evans, Charles, 2001. Nominal Rigidities and the Dynamic Effects of a Shock to Monetary Policy. Working Paper No. 01-07. Federal Reserve Bank of Cleveland.

Copaciu, Mihai, 2004. Nominal Price Rigidities. Empirical Evidence from Hungarian Supermarkets. MA Thesis. Central European University, Budapest.

Coricelli, Fabrizio, Horvath, Roman, 2006. Price Setting Behavior: Micro Evidence on Slovakia. Discussion Paper No. 5445. Centre for Economic Policy Research.

Dutta, Shantanu, Bergen, Mark, Levy, Daniel, Venable, Robert, 1999. Menu Costs, Posted Prices, and Multiproduct Retailers. Journal of Money, Credit and Banking 31, 683-703.

Fabiani, Silvia, Gattulli, Angela, Sabbatini, Roberto, 2004. The Pricing Behavior of Italian Firms: New Survey Evidence on Price Stickiness. Working Paper No. 333. European Central Bank.

Fabiani, Silvia, Druant, Martine, Hernando, Ignaco, Kwapil, Claudia, Landau, Bettina, Loupias, Claire, Martins, Fernando, Mathä, Thomas Y., Sabattini, Roberto, Stahl, Harald, Stokman, Ad, 2005. The Pricing Behavior of Firms in the Euro Area: New Survey Evidence. Working Paper No. 535. European Central Bank.

Filer, Randall K., Hanousek, Jan, 2003. Inflationary Bias in Middle to Late Czech Republic. Economic Systems 27. 367–376.

Fuhrer, Jeff C., 1997. The (Un)importance of Forward Looking Behavior in Price Specifications. Journal of Money, Credit, and Banking 29(3). 338-350.

Galí, Jordi, Gertler, Mark, 1999. Inflation Dynamics: A Structural Econometric Analysis. Journal of Monetary Economics 44 (2). 195-222.

Hall, Simon, Walsh, Mark, Yates, Anthony, 1997. How do UK Companies Set Prices?. Working Paper No 67. Bank of England.

Hammermann, Felix, 2007. Nonmonetary Determinants of Inflation in Romania: A Decomposition. Working Paper No 1322. Kiel Institute for the World Economy.

Kackmeister, Alan, 2003. The Variability of Relative Retail Price Changes: The 1890s vs. the 1990s. Revised section from Ph.D. dissertation. University of California, Berkeley.

Kashyap, Anil K., 1995. Sticky Prices: New Evidence from Retail Catalogs. Quarterly Journal of Economics 110. pp. 245-74.

Kwapil, Claudia, Baumgartner, Josef, Scharler, Johann, 2005. The Price-Setting Behavior of Austrian Firms: Some Survey Evidence. Working Paper No. 464. European Central Bank.

Kleshchelski, Isaac, Vincent, Nicolas, 2007. Market Share and Price Rigidity. Job Market Paper. Northwestern University.

Levy, Daniel, Bergen Mark, Dutta Shantanu, Venable, Robert, 1997. The Magnitude of Menu Costs: Direct Evidence from a Large U.S. Supermarket Chain. Quarterly Journal of Economics 112, 791-825.

Loupias, Claire, Ricart, Roland, 2004. Price Setting in France: New Evidence from Survey Data. Working Paper No. 423. European Central Bank.

Martins, Fernando, 2005. The Price Setting Behavior of Portuguese Firms: Evidence from Survey Data. Working Paper No. 562. European Central Bank.

National Bank of Romania (NBR), 2007. 2006 Financial Stability Report. Available at www.bnro.ro.

Neves, Pedro D., Dias, Daniel, Dias, Monica, 2004. Stylized Features of Price Setting Behavior in Portugal: 1992-2001. Working Paper No. 332. European Central Bank.

Ratfai, Attila, forthcoming. The Frequency and Size of Price Adjustments: Microeconomic Evidence. Managerial and Decision Economics.

Ratfai, Attila, 2003. Staggering versus Synchronization in Retail Price Changes. Available at https://www.cerge-ei.cz/pdf/gdn/RRCII_37_paper_01.pdf .

Rotemberg, Julio, 2005. Customer Anger at Price Increases, Changes in the Frequency of Price Adjustment and Monetary Policy. Journal of Monetary Economics 52 (4). 829 – 852.

Sheshinski, Eytan, Weiss, Yoram, 1977. Inflation and Costs of Price Adjustment. Review of Economic Studies 44. 287-303.

Sheshinski, Eytan, Weiss, Yoram, 1992. Staggered and Synchronized Price Policies under Inflation: The Multiproduct Monopoly Case. In Sheshinski, Eytan, Weiss, Yoram (Eds.), Optimal Pricing, Inflation and the Cost of Price Adjustment, MIT Press, pp. 169-213.

Smets, Frank, 2003. Maintaining Price Stability: How Long is the Medium Term?. Journal of Monetary Economics 50. 1293-1309.

Stokman, Ad, Hoeberichts, Marco, 2006. Price Setting Behaviour in the Netherlands: Results of a Survey. Working Paper No. 607. European Central Bank.

Taylor, John B., 1999. Staggered Price and Wage Setting in Macroeconomics. In Taylor, John, B. and Woodford, Michael (Eds.), Handbook of Macroeconomics, Ch.15. Elsevier, New York.

Wolman, Alex L., 2003. The Frequency and Costs of Individual Price Adjustment. Economic Quarterly. Federal Reserve Bank of Richmond.

Zbaracki, Mark J., Ritson, Mark, Levy, Daniel, Dutta, Shantanu, Bergen, Mark. 2004. Managerial and Customer Costs of Price Adjustment: Direct Evidence from Industrial Markets.Review of Economics and Statistics 86 (2), 514-533.

Appendix A

Table A.1: Detailed list of the NACE sectors covered

	Name of the two digit NACE sector		Big NACE group
Section A	**Agriculture, hunting and forestry**	**Agriculture**	**NACE group 1**
01	Agriculture, hunting and related service activities		
02	Forestry, logging and related service activities		
Section B	Fishing		
05	Fishing, operation of fish hatcheries and fish farms; service activities incidental to fishing		
Section D	**Manufacturing**	**Manufacturing**	**NACE group 2**
15	Manufacture of food products and beverages		
16	Manufacture of tobacco products		
17	Manufacture of textiles		
18	Manufacture of wearing apparel; dressing and dyeing of fur		
19	Tanning and dressing of leather; manufacture of luggage, handbags, saddlery, harness and footwear		
20	Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials		
21	Manufacture of pulp, paper and paper products		
22	Publishing, printing and reproduction of recorded media		
23	Manufacture of coke, refined petroleum products and nuclear fuel		
24	Manufacture of chemicals and chemical products		
25	Manufacture of rubber and plastic products		
26	Manufacture of other non-metallic mineral products		
27	Manufacture of basic metals		
28	Manufacture of fabricated metal products, except machinery and equipment		
29	Manufacture of machinery and equipment n.e.c.		
30	Manufacture of office machinery and computers		
31	Manufacture of electrical machinery and apparatus		
32	Manufacture of radio, television and communication equipment and apparatus		
33	Manufacture of medical, precision and optical instruments, watches and clocks		
34	Manufacture of motor vehicles, trailers and semi-trailers		
35	Manufacture of other transport equipment		
36	Manufacture of furniture; manufacturing n.e.c.		

37	Recycling		
Section E	**Electricity, gas and water supply**	**Electricity (Services I)**	**NACE group 3**
40	Electricity, gas, steam and hot water supply		
41	Collection, purification and distribution of water		
Section F	**Construction**	**Constructions**	**NACE group 4**
45	Construction		
Section G	**Wholesale and retail trade; repair of motor vehicles, motorcycles and personal and household goods**	**Trade**	**NACE group 5**
50	Sale, maintenance and repair of motor vehicles and motorcycles; retail sale of automotive fuel		
51	Wholesale trade and commission trade, except of motor vehicles and motorcycles		
52	Retail trade, except of motor vehicles and motorcycles; repair of personal and household goods		
Section H	**Hotels and restaurants**	**Services II**	
55	Hotels and restaurants		
Section I	**Transport, storage and communication**		**NACE group 6**
60	Land transport; transport via pipelines		
61	Water transport		
62	Air transport		
63	Supporting and auxiliary transport activities; activities of travel agencies		
64	Post and telecommunications		

Table A.2: Post-stratification weights and response rates

NACE sector	Size	Population		Respondents		Weights	
		E_p	$\frac{E_p}{E}*100$	e_p	$\frac{e_p}{e}*100$	$w_p = (\frac{\frac{E_p}{E}}{\frac{e_p}{e}}) * \rho$	*Number of answers in the unweighted sample*
1&2&5	1	29892	1.04	212	0.12	1.39	11
	2	26880	0.93	74	0.04	3.57	1
	3	60054	2.08	27654	15.01	0.02	4
15&16	1	54024	1.87	361	0.20	1.47	18
	2	56293	1.95	243	0.13	2.28	3
	3	71512	2.48	4298	2.33	0.16	6
17	1	11678	0.41	148	0.08	0.78	5
	2	35209	1.22	219	0.12	1.58	1
	3	45672	1.58	365	0.20	1.23	1
18	1	28635	0.99	146	0.08	1.93	6
	2	90497	3.14	1306	0.71	0.68	7
	3	145200	5.04	9533	5.18	0.15	15
19	1	11554	0.40	22	0.01	5.17	1
	2	44367	1.54	786	0.43	0.56	7
	3	43419	1.51	311	0.17	1.37	1
20&21&22	1	37029	1.28	390	0.21	0.93	17
	2	48030	1.67	818	0.44	0.58	8
	3	30898	1.07	1168	0.63	0.26	2
23&24	1	5589	0.19	40	0.02	1.37	2
	2	10191	0.35	233	0.13	0.43	4
	3	41545	1.44	8188	4.45	0.05	2
25	1	10015	0.35	75	0.04	1.31	3
	2	12540	0.44	88	0.05	1.40	1
	3	18295	0.63	389	0.21	0.46	1
26	1	8514	0.30	60	0.03	1.40	2
	2	16618	0.58	220	0.12	0.74	2
	3	39024	1.35	862	0.47	0.45	2
27&28	1	26077	0.90	169	0.09	1.52	7
	2	39469	1.37	493	0.27	0.79	6
	3	98378	3.41	11500	6.24	0.08	5
29	1	6263	0.22	72	0.04	0.86	2
	2	18843	0.65	238	0.13	0.78	1
	3	79371	2.75	1532	0.83	0.51	4
30	1	1235	0.04	38	0.02	0.32	1
	2	1789	0.06	59	0.03	0.30	1
	3	2050	0.07	1299	0.71	0.02	1
31&32	1	4062	0.14	18	0.01	2.22	1
	2	9258	0.32	55	0.03	1.66	1
	3	64215	2.23	8570	4.65	0.07	5

33&34&35	1	7769	0.27	122	0.07	0.63	4
	2	16105	0.56	79	0.04	2.01	1
	3	104568	3.63	12270	6.66	0.08	6
36&37	1	22238	0.77	215	0.12	1.02	10
	2	40400	1.40	494	0.27	0.80	4
	3	46972	1.63	3158	1.71	0.15	4
40&41	1	2129	0.07	29	0.02	0.72	1
	2	16800	0.58	511	0.28	0.32	3
	3	130039	4.51	6802	3.69	0.19	5
45	1	83771	2.91	615	0.33	1.34	26
	2	114697	3.98	1062	0.58	1.06	8
	3	113153	3.93	1490	0.81	0.75	3
50	1	28796	1.00	170	0.09	1.67	7
	2	21914	0.76	317	0.17	0.68	3
	3	10837	0.38	358	0.19	0.30	1
51	1	91863	3.19	696	0.38	1.30	30
	2	67780	2.35	745	0.40	0.90	9
	3	49064	1.70	5776	3.14	0.08	2
52&55	1	137682	4.78	970	0.53	1.40	46
	2	62007	2.15	860	0.47	0.71	8
	3	51791	1.80	2448	1.33	0.21	1
60&61&62	1	32832	1.14	233	0.13	1.39	11
	2	33774	1.17	140	0.08	2.37	2
	3	96377	3.34	26278	14.27	0.04	5
63&64	1	12115	0.42	80	0.04	1.49	4
	2	15188	0.53	98	0.05	1.52	1
	3	86854	3.01	35933.00	19.51	0.02	4
Total		**2881700**	**100**	**184201**	**100**	**63.99**	**377**

Notes: Size 1-small firms (10-49 employees); 2-medium firms (50-249 employees); 3-large firms (>=250 employees). E_p -the number of employees in the population in stratum p; E-number of employees in the population. e_p -number of employees of the responding firms in stratum p; e-number of employees for all the responding firms. $w_p = (\frac{\frac{E_p}{E}}{\frac{e_p}{e}}) * \rho$ is the post stratification weight for each stratum p, with ρ being a rescaling factor such that after the post stratification we obtain the same number of respondents.

Table A.3: The perceived degree of competition

	All		*Big NACE group*			*Size*	
			NACE 2	*NACE5*	*Small*	*Medium*	*Large*
Number of competitors							
None	3.3		5.63	1.6	2.2	6.24	10.22
Less than 5	9.06		12.89	8.52	6.87	16.14	17.03
5-20	19.34		21.23	19.39	17.75	26.92	14.14
More than 20	67.48		59.14	69.42	72.15	50.7	57.92
Market share							
100%	15.24		18.32	10.68	17.95	5.63	5.8
51-99%	16.22		14.11	18.72	17.96	10.39	8.37
16-50%	16.62		12.33	20.63	15.14	22.92	16.09
5-15%	17.21		16.22	19.98	16.36	19.04	26.46
Less than 5%	34.68		38.96	29.99	32.58	42.02	42.41
Elasticity of demand -price increases by 10%, the quantity sold decreases by:							
More than 10%	40.04		38.33	43.24	41.46	37.37	26.93
10%	12		7.6	17.26	13.03	7.38	14.83
Less than 10%	19.19		20.91	15.93	17.05	27.26	20.39
Do not know	28.77		33.15	23.58	28.46	27.98	37.85
The price is determined by:							
Company	63.45		58.84	78.55	65.15	60.91	44.72
Mother company	4.97		5.78	4.72	3.56	10.41	5.15
Our clients	28.79		33.19	13.05	29.37	25.37	34.06
Regulated	1.48		1.18	1.09	0.74	3.32	6.28
Other	1.31		1.01	2.59	1.17	0	9.79
Factors for determining price increase/decrease							
Competitors' price							
Increases	2.91		2.85	3.09	2.89	3.05	2.48
decreases	3.15		3.15	3.3	3.16	3.17	2.92

Note: Differences up to 100 are due to the rounding errors. Numbers presented in the paper are rounded to the nearest integer.

Appendix B: The questionnaire

Survey on price setting behavior

Please return the completed questionnaire by 15th of November 2006 at latest

The present questionnaire will take approximately 20 minutes of your time in order to be completed. Your answers will be treated confidentially according to the existing legislation and used only for research. Thank you for your cooperation!

Name of the company...... **Identification number.**.....

We ask you that the person that completes the questionnaire to be familiar with the price setting process (e.g. Executive Manager, Financial Manager, Administrator). If your firms sells more than one product/service, please refer in your answers to the ***product/service that in 2005 contributed the most to your firm turnover. This product/service will be mentioned from now on the questionnaire as the "Main Product/Service".***

Your answers can be returned by one of the following means:

- Return the completed questionnaire in the attached addressed and stamped envelope.
- Send the completed questionnaire through fax to the following number: 021/3130654
- Send an email to sondajpreturi@bnro.ro for receiving the questionnaire in electronic format, complete it and return it to the same address.

For any questions or details you can contact us at the following phone number:021/3130683 or to the following email address : sondajpreturi@bnro.ro.

Section A: General information

A.1. What is your company's ***Main Product/Service*****?** (the product/service that generated most of your turnover during 2005)? .....

A.2. The percentage of turnover generated by your ***Main Product*** in 2005: ……%

A.3. What share of your turnover was generated in 2005 from relations in or with partners:

3.1. In Romania.....	
3.2. In EU.....	
3.3. Other.....	
Total	100%

A.5. On the Romanian market, how many competitors do you have? (choose only one option)

5.1 No main competitor.....	
5.2. Less than 5.....	
5.3. Between 5 and 20.....	
5.4. More than 20…..……	

A.4. Your main clients are (choose only one option):

4.1. SMEs from Romania….....	
4.2. Large Romanian companies.....	
4.3. Direct to population…….....	
4.4. Central and local authorities.	
4.5. Foreign entities…..……....	

A.6. The market share of your main product on the Romanian market is? (choose only one option):

6.1 100%.....	
6.2. 51%-99%.....	
6.3. 16%-50%.....	
6.4. 5%-15%.....	
6.5. Less than 5%.....	

A.7. Most of your customers are (choose only one option):

7.1. Regular (there is stable commercial relationship: e.g. multiple contracts for a longer period of time).....	
7.2. Occasional. …….....	

Section B: Price setting at your company

B.1. The price of your ***main product*** is determined inside your company or by somebody outside the company? (please choose only one option)

1.1. We set the price .... ☐
1.2. The price is set by the parent company.......... ☐
1.3. The price is set through direct negotiation with the clients... ☐
1.4. The price is regulated by the authorities......... ☐
1.5. Other (please mention):.........…………............ ☐

If at question B.1 you chose answer 1.1 (We set the price):
B.2. How do you usually compute the price of your ***main product*** on the Romanian market? (choose only one option)

2.1. A mark-up is applied to the unit variable costs (labor costs and cost of other inputs)……….................. ☐
2.2. We set the market price.……......…...…................ ☐
2.3. We take the price of the main competitor as a reference.. ☐
2.4. Other (please mention):.. ☐

B.3. The unit price for your ***main product*** is (choose only one option):

3.1. Same for all customers…………….............. ☐
3.2. Depends on the quantity sold...……............... ☐
3.3. Depends on the situation (please mention)..... ☐

B.4. Your pricing decisions are based besides current info on data from previous years or on forecasts?

4.1. Data from previous years ....………...…......... ☐
4.2.Forecasts…………………………......……...…… ☐
4.3. A combination of previous data and forecasts ..... ☐

B.5. Firms usually make computations regarding the price of their products (e.g. if it is to big or too small compared with what it should be). Following these computations, ***the firm changes or leaves unchanged the selling price of the product***. Inside your firm, this type of computations, ***where the price is not necessarily changed***, are made (check only one option):

5.1. Usually at a well defined time interval (e.g. monthly, quarterly)... ☐
5.2. Just as a reaction to specific events (e.g. demand fluctuations)... ☐
5.3. Usually at a well defined time interval, but also as reaction to specific events.. ☐

B.6. In ***2005*** how many times did you do such computations regarding the price of your ***main product***? (meaning how many times you effectively changed the price plus the number of times when you made computations but you did not change it)

	2005
Number of times:................……..…………	

B.7.In ***2005*** how many times did you effectively change the price of your ***main product***?

	2005
Number of changes...............……………………..	

B.8. In ***2005***, in which month(s) did you change the pric of your ***main product***? (you can check more options)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec

B.9. The average size of one price change in 2005 was:

	< 4%	***4 -8%***	***8-12%***	***>12%***
9.1. ***For price increases*** (choose only one option)..				
9.2. ***For price decreases*** (choose only one option)...				

B.10. Generally, is/are there any month(s) when the price is most probably to be changed? (in case of positive answer you can choose more options)

10.1. No ☐
10.2. Yes:

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec

B.11. If you decided to increase the price of your ***main product*** by 10%, and all the other things would remain unchanged (including the price of your competitors), by what *percentage would the number of sold units of your product fall*? (choose only one option)

11.1. More than 10% .... ……………..…..............………..……………………….. ☐
11.2. Approximately 10% ..…………………...…..............………………………... ☐
11.3. Less than 10%........……………….………………..........………….. ☐
11.4. I do not know.. ☐

Section C: Determinants of price changes

C.1. Indicate the significance of the following factors that might cause you to raise/lower the price of your company's ***main product*** (where: *1-unimportant, 2-little important, 3-important, 4-very important, 0- I do not know) (complete all the options)*

	Price increase	Pric decrease
1.1. Inflation rate		
1.2. Change in labor costs		
1.3. Change in financial costs (e.g. interest rate)		
1.4. Change in the cost with the raw materials		
1.5. Change in the exchange rate RON/EUR		
1.6. Change in the demand for your product		
1.7. Change in the price of the competitors		
1.8. Seasonal factors		
1.8. Other (please mention)		

C.2. There can be various reasons why prices are not changed during a certain period. Indicate the significance of the following factors for your company ***main product*** (where: *1-unimportant, 2-little important, 3-important, 4-very important; 0-I don't know) (complete all the options)*

2.1. The existence of a fixed term contract that prohibits a price change	
2.2. Price changes imply physical costs (new catalogues, change of price tags, change of website information etc.)	
2.3. The information necessary to change the price is costly in terms of money and time	
2.4. There is the risk of being the first to adjust the prices. Thus, we better wait for the competitors and then follow	
2.5. Our customers prefer stable prices and changes might damage the relation with them	
2.6. There is the risk that shortly we should change the price again in the opposite direction	
2.7. A price reduction might be interpreted as a change in quality	

Section D. Wage setting behavior

D.1. On average, how often are the wages changed in your company? (choose only one option)

1.1. At least 3 times per year	
1.2. Two times per year	
1.3. Once per year	
1.4. Less than once per year	

D.2. If the wages are indexed to inflation (choose only one option):

2.1. They are indexed with the *past* inflation	
2.2. They are indexed with the expected inflation.	
2.3. It is not the case	

D.3. Is there any particular month (or months) when wages are most likely to change? (in case of positive answer you can choose more options)

3.1. No ☐

3.2. Yes:

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec

D.4. Indicate the significance of the following factors that might cause you to raise/lower the wages in your company through: *1-unimportant, 2-little important, 3-important, 4-very important, 0- I do not know (complete all options).*

4.1. Change in the productivity	
4.2. Change in the inflation rate	
4.3. Change in taxes	
4.4. Changes in demand	

Section E: Reaction to strong financial shocks

E.1. Estimate the impact on the **price** of your ***MAIN PRODUCT*** of the following hypothetic scenarios (through: *1-unimportant, 2-little important, 3-important, 4-very important, 0-i do not know).* Check **only one option** for **each** of the following 6 scenarios.

Scenario 1: 1 euro = 3,9 RON					**Scenario 2**: 1 euro = 4,6 RON				
1	2	3	4	0	1	2	3	4	0
Scenario 3: 1 euro = 2,7 RON					**Scenario 4**: Interest rate for credits in foreign currency (EUR, USD) increases to 15%				
1	2	3	4	0	1	2	3	4	0
Scenario 5: Interest rate for credits in national currency increases to 20%					**Scenario 6**: Interest rate for credits in national currency increases to 30%				
1	2	3	4	0	1	2	3	4	0

E.2. Estimate the impact on the **costs** of your ***MAIN PRODUCT*** of the following hypothetic scenarios (through: *1-unimportant, 2-little important, 3-important, 4-very important, 0-i do not know).* Check **only one option** for **each** of the following 6 scenarios.

Scenario 1: 1 euro = 3,9 RON					**Scenario 2:** 1 euro = 4,6 RON				
1	2	3	4	0	1	2	3	4	0
Scenario 3: 1 euro = 2,7 RON					**Scenario 4**: Interest rate for credits in foreign currency (EUR, USD) increases to 15%				
1	2	3	4	0	1	2	3	4	0
Scenario 5: Interest rate for credits in national currency increases to 20%					**Scenario 6**: Interest rate for credits in national currency increases to 30%				
1	2	3	4	0	1	2	3	4	0

Section F: Behavior on the international markets (*only to be filled by the companies for which exports represent more than 20% of their turnover)*

F.1. What is the importance of the following factors in discriminating your price between markets? (where: *1-unimportant, 2-little important, 3-important, 4-very important, 0- do not know) (please complete all options)*

1.1. Exchange rates (e.g. RON/country of destination currency) movements…….....
1.2. The tax system of the exports' destination country .....…….....
1.3. Transportation costs.....…….....…….....
1.4. Fluctuation in the demand in the destination country.....…..…….....
1.5. Characteristics (tastes, standard of living) of the destination market…….....
1.6. Other (please mention)…...…..…….....….....

F.2. If the Romanian Leu appreciates in nominal terms by 10%, vis-à-vis of the currency of the contract, how would you change in the future the price **on that market**? (choose only one option)

2.1. The price will increase more than 10%….....…….…….....
2.2. The price will increase with less than 10%..…….....…….…….....
2.3. The price will increase with than 10%…….....…….…….....
2.4. The price will remain unchanged…….....…….…….....