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Price and Wage Rigidities in the Republic of Macedonia: Survey Evidence from Micro-Level Data

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Introduction

- This paper exploits the information collected from an ad hoc survey conducted on a sample of 514 Macedonian firms to study the extent of nominal price and wage rigidities

- The paper investigates the relative influence of several important determinants on the frequency of price changes identified in the literature, such as the degree of product market competition, the cost structure or firms’ size

Introduction (2)

- We also set a model which is able to track idiosyncratic characteristics explaining why base wages in some firms tend to be more flexible as compared to other firms

- These features include the wage bargaining institutional setup, the composition and characteristics of the workforce and the wage structure

Econometric Framework

- Bayesian ordered Probit models
- Using the study by Druant et al. (2009) as a reference study we construct our prior as following:
- For the coefficient associated with variable, we center the prior mean on the corresponding coefficient estimate obtained by Druant et al. (2009)

Econometric Framework (2)

- We use a hierarchical prior setup that allows us to set the tightness of the prior in a data-based fashion
- This allows us to derive posterior quantities which are infused with prior information when the data is becoming increasingly non-informative
- Posterior inference is carried out using the MCMC algorithm put forward by Albert and Chib (1993)

Determinants of Price Changes

- A categorical variable was created by collapsing firms' answers to the question on the frequency of price changes
- For the sake of simplicity, we regrouped the possible answers into four categories (1 – "daily to monthly", 2 – "quarterly to half-yearly", 3 – "yearly" and 4 – "less frequently than yearly")

Determinants of Price Changes (2)

- The estimated model controls for features of the firms' such as the sector of activity (manufacturing, construction, trade and business services) or the size (in terms of employees: 5-19, 20-49, 50-199, more than 199)
- The choice of the remaining covariates is motivated by the existing pricing models from the field literature

Determinants of Price Changes (3)

- *Market competition* variable captures the degree of competition faced by a firm from the relevance it associates with changes in competitors' to explain own price decreases

- It takes value of 1 if a firm considers a price decrease likely or very likely when its main competitors decide to cut their prices and 0 otherwise

Determinants of Price Changes (4)

- The intensity of *External competitive pressure* was proxied with a variable that captures the exposure of the firm on foreign markets, measured by the share of exports on total sales

- *Labour cost share* – aims at measuring the relevance of labour cost in price setting. It takes the value of 1 for those firms where the labour cost share exceeds the median labour cost share in the sample and 0 otherwise

Determinants of Price Changes (5)

- There are traditionally two approaches for modelling price reviewing behaviour: time-dependent rules and state-dependent rules
- In the presence of frequent shocks, the time-dependent pricing might lead to stickier prices than the state-dependent, but still, provided that the time frame is quite large and the cost of adjustment is low
- Dummy variable that takes value of 1 if firms follow a *state-dependent pricing* and 0 otherwise

Determinants of Wage Changes

- The survey investigates the process of wage setting through the following question: "How often are wages in your firm changed for any reason?"
- The possible answers ranged from 1 to 3, where 1=more frequently than yearly; 2=yearly; 3=less frequently than yearly
- The value categories of the dependent variable are increasing in the degree of wage stickiness

Determinants of Wage Changes (2)

- *Firm-level agreement* variable is equal to 1 if the firm applies a firm-level collective agreement and 0 otherwise. The adoption of a less centralized level of wage setting is expected to induce higher wage flexibility
- The model also controls for characteristics of the workforce which are taken into account through two indicators

Determinants of Wage Changes (3)

- The first is a dummy (*Permanent workers*) that takes the value 1 for those firms where the share of permanent workers is equal or greater than the sample median and 0 otherwise

- The second is also a dummy (*High-skilled workers*) that takes the value 1 for those firms where the share of high-skilled workers is equal or greater than the sample median and 0 otherwise

Determinants of Wage Changes (4)

- The model also controls for the availability of alternative margins of labour cost adjustment other than base wages (this provides firms with additional room to adjust their labour costs)

- *Share of flexible components* (bonuses) was included to measure the extent to which firms with a higher share of the flexible pay components in total labour costs are also those with a lower degree of wage rigidity

Determinants of Wage Changes (5)

- The model also considers the correlation between frequency of wage changes and the presence of *indexation mechanisms* of wages to inflation
- *Workforce turnover* variable – workers who leave the firm as a percentage of the total workforce
- The model on the frequency of wage changes also controls for firms' characteristics such as the sector of activity or the firm size

Findings: factors behind price changes

- Comparing firms in manufacturing (the reference category) with their counterparts engaged in construction, trade and market services reveals that the former are less prone to leave the price unchanged for more than one year

- Prices are changed less frequently in large firms (with 20+ employees). Conversely, higher price flexibility is more typical for the small firms

Findings: factors behind price changes (2)

- Firms operating in more competitive environments change their prices more frequently
- Companies which are increasingly operating abroad tend to adjust prices faster as compared to counterparts operating solely on domestic markets
- Price reviewing rules do not seem to have a statistically significant bearing on the frequency of price changes

Findings: factors behind price changes (3)

- When it comes to the firms' cost structure, the results confirm that a greater share of labour costs in total costs is associated with lower flexibility of prices
- This suggests that stickiness in wages and labour costs might be one of the factors behind the slow adjustment of prices

Findings: factors behind wage changes

- The degree of wage flexibility does not differ substantially across sectors
- Higher wage rigidity is more prevalent in small firms than in large firms
- Also the firm-level collective bargaining does not seem to have a statistically significant impact on the flexibility of wages

Findings: factors behind wage changes (2)

- Firms in which the flexible pay components (bonuses) account for a greater share of total labour costs exhibit a higher degree of wage flexibility
- On the other hand, the impact of the share of permanent employees on wage flexibility is not statistically significant

Findings: factors behind wage changes (3)

- Firms with a higher share of high-skilled workers do not display statistically different bearing on wage flexibility, which to some extent might reflect the relatively poor outside options, as well as the over-education as a consequence of it

- The results point out that the presence of formal or informal indexation clauses of wages to inflation deliver higher flexibility of wages

Conclusion

- The multivariate analysis of the determinants of price and wage rigidity confirms that more frequent price adjustments are associated with more intense competitive pressure, higher exposure to foreign markets, as well as with a lower share of labor costs in total costs

Conclusion (2)

- Higher wage flexibility, on the other hand, is contingent on the presence of higher workforce turnover, the availability of margins of labor cost adjustment other than changes in base wages, as well as on the presence of formal or informal wage indexation clauses

Thank you for your attention!