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Competition across transition economies: an enterprise-level analysis of the main policy and structural determinants

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Abstract

This paper examines the main policy and structural determinants of the intensity of competition at the enterprise level across transition economies, presenting new evidence based on an enterprise-level survey and a legal survey directed to both competition agencies and legal experts in the area of competition policy. It explores the key variables, at the country and enterprise level, that affect the variations of the intensity of competition in domestic markets. At the country level an important finding is that competition policy and recent changes in its implementation are significantly and positively correlated with the intensity of competition. This result is robust to the introduction of other policy-level controls and alternative specifications of the basic model. Other interesting results at the micro level include a significant positive relationship between the intensity of competition, lower barriers to entry and exit, and higher perceived elasticity of demand. In addition there are robust ownership, size and sectoral effects but not life-cycle effects.

Keywords: competition, competition policy, transition economies

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1. INTRODUCTION

Competition through entry of new firms has been viewed as an essential element of transition towards a market economy. Recent theoretical work in the context of transition economies has emphasised the role of increased competition though various channels, including the mechanism of market selection, that both improve the average performance of incumbent firms and encourage entry of low-cost firms (Aghion and Schankerman, 2000).

What is required to ensure competition in the process of transition is still viewed as controversial. There exists a broad range of economic policies that in principle can support the promotion of rivalry. Several policies that have been argued to be most effective tools in reaching this objective are: competition policy, trade liberalisation, policies hardening budget constraints and reducing barriers to exit, or encouraging entrepreneurship and reducing barriers to entry. Privatisation can also in principle lead to the creation of a more competitive environment. However, because of the transition economies' legacy of pervasive monopolies by many state-owned enterprises, some economists have raised doubts on its effectiveness (Newbery and Kattuman, 1992). Namely, there is a clear danger that privatisation simply implies the move from a state-owned to a private monopoly.

This paper explores some of the main drivers of the variation in the intensity of competition across countries and at the enterprise level ten years after the beginning of the transition period. This paper is related to recent country-level work on the importance of legal rules affecting market developments, such as La Porta et al. (1998) in the area of corporate governance and Dutz and Vagliasindi (2000) in the area of competition policy. However, here the focus is mainly on competition policy implementation as the key policy variable – rather than law on the books – and the analysis is carried out at the enterprise level. It aims to shed some light on the relative contribution of direct measures to establish competition (such as competition policy implementation) versus other alternative policies to the development of a more competitive environment. Firms have an incentive to monopolise the market to gain market power. In the absence of competition policy authorities, this can be achieved simply through horizontal mergers. Competition policy aims to influence not only conduct but also market structure by preventing horizontal and vertical agreement and mergers that would limit competition, and through advocacy efforts that promote the demand for competitive outcomes.

The effective implementation of competition policy is a very difficult task requiring a high level of knowledge and expertise. In addition, initial structural conditions prevailing in transition economies make implementation a much more challenging task than in advanced countries. Entry barriers arising from high levels of market concentration, state ownership and control, rigidities and bottlenecks in the mobility of resources are all likely to be high in transition economies, and often can facilitate anti-competitive conduct by enterprises. Lastly, most transition economies still have a larger number of administrative and regulatory barriers to competition, including the discretionary granting of various forms of subsidies to loss-making enterprises. In this connection it seems particularly important for competition authorities also to engage in competition advocacy to counter public policies that tend to impose entry barriers and prevent market access.

There is also a parallel between this paper and recent work on the impact of the business environment on enterprise performance, such as Carlin et al. (2001) and the relationship between the state and enterprises, as described in Hellman and Schankerman (2000). Here the focus is on structural measures of intensity of competition. Yet there exists little empirical work directly addressing the determinants of competition across transition economies and the extent to which it is promoted by better implementation of competition policy or alternative

policies or blunted by policy-related barriers to exit and entry. To complement the analysis, it also studies other direct links between enterprises and their competitors at the micro-level highlighting the role of the main factors identified by the theory of the firm. Most empirical studies on industrial market structure used aggregate data or sector-level data to explain differences in concentration using a small number of explanatory variables (such as market size). In contrast, the use of firm-level data not only increases the reliability of the estimates, due to an increased number of observations, but also allows one to take into account firms' heterogeneity within sector. Moreover, the proposed relationships to be estimated are derived from the theory of the firm and in principle testing them requires the use of firm-level data. The game theoretical approach to industrial organisation raised problems of predictability, depending on the functional form of the model and because of the presence of multiple equilibria in oligopolistic competition. In spite of this, some basic relationships hold irrespectively of the precise specification of the model, such as the link between on the one hand the intensity of competition and on the other hand the perceived elasticity of demand and the nature and intensity of entry barriers. The key result of our analysis suggests that competition policy implementation and changes in implementation are significantly and positively correlated with a key structural competition variable. This result is robust to other policy-level controls and alternate specifications of the basic model. At the micro level there is strong evidence of a positive relationship of the intensity of competition and lower barriers to entry and exit. Concerning enterprise characteristics, ownership size and sectoral effects dominate life-cycle effects.

The structure of the paper is as follows. Section 2 discusses the expected relationships between the intensity of competition and explanatory variables, including enterprise variables derived from the theory of industrial organisation. Section 3 provides a careful description of the variables used in the empirical analysis. Section 4 reports evidence of the impact of competition policy implementation on a structural indicator of intensity of competition. A final section concludes.

2. THEORETICAL PREDICTIONS

Table 1 summarises the expected signs of the relationship between the intensity of competition and the selected explanatory variables at the country and enterprise level. At the country level, there is a broad range of policies that should affect the intensity of competition. The most direct policy is the development of national competition policies. Their effective implementation should be positively associated with higher intensity of competition.

Table 1
Expected relationship between intensity of competition and explanatory variables

Variables	Source	Exp. sign
Exogenous policy country-level variables		
Competition policy	Dutz and Vagliasindi (2000) and Vagliasindi (2002)	**+**
Import penetration	EBRD	**+**
Privatisation	EBRD	**?**
Enterprise-level variables		
Elasticity of demand	BEEPs	**+**
Entry barriers	BEEPs	**–**
Exit barriers	BEEPs	**–**
Basic controls		
Private ownership	BEEPs	**+**
Size	BEEPs	**–**
Age	BEEPs	**?**

Liberalisation policies, spurring international rivalry though import penetration, are also expected to be positively related to the intensity of competition, since they constrain monopoly power and can act as a substitute for competition policy.[1] However, some economists suggest that the ability of imports to constrain market power might be rather limited, as it might be the case that the dominant firm is also the major importer of the product and therefore these firms can still exercise monopoly power over pricing. In the case of privatisation the link with higher intensity of competition is ambiguous, since privatisation by itself is not a sufficient condition to enhance competition. The associated market structure might be unchanged – in the case in which a private monopoly replaces a public one – or might be more concentrated, if privatisation is taking place through mergers and consolidation of the existing enterprises.

For a long time a significant portion of the literature on industrial market structure has focused on explaining differences in concentration across industries using a small number of explanatory variables (such as market size). Such an approach has been criticised on the

[1] Baldwin (1995) finds a positive effect of both foreign competition from import competition in Canada and the United States on mobility and Konings et al. (2001) for two small open economies (Belgium and Netherlands).

grounds of unobservability of key variables that are also likely to vary across industries. The dilemma determined by the game theoretical approach is that even if we can identify the specification of the game, multiple equilibria are likely to arise. That led some to conclude that "with oligopoly everything can happen". Despite such uncertainty, there are some basic relationships that are robust to the different specification of the game. Namely, structural indicators of the intensity of competition (for instance concentration indicators, such as the Herfindahl index) are shown to depend upon a number of variables, including the market demand elasticity, and the nature and extent of barriers to entry. We explore the expected signs of the relationship of these variables with the intensity of competition according to the theory of industrial organisation.

An increase in the elasticity of demand might be interpreted as associated with a more aggressive competitive strategy – based on prices rather than output – and, as such, is likely to be associated with an increase in the intensity of competition. Singh and Vives (1984) proved that the perceived elasticity of demand is higher in price competition than in quantity competition and as a consequence price competition is more competitive, providing support for the conventional wisdom.[2] The basic intuition goes as follows: in quantity competition when a firm wants to sell an extra unit of its product the price has to fall to match lower marginal utility given a fixed consumption of the other goods. Hence, in price competition the same sales increase requires a smaller price decrease because a lower price also makes consumers switch to other goods.

Barriers that limit entry and competition in the market are considered to be a major source of market power and accordingly hinder competition. The industrial organisation literature, starting with Sutton (1991), applied the bounds approach to study the relationship between concentration and market size, and distinguishes between exogenous and endogenous barriers to entry. Sutton's predictions are that in exogenous sunk cost industries the lower bound to concentration tends to zero. That is, concentrated outcomes cannot be sustained even in large markets. Such outcomes are not replicable in the presence of endogenous sunk cost (that is, where R&D and advertising are endogenised). In this case the lower bound to concentration is bounded away from zero. Nocke (2000) showed that the upper bound of concentration does not decrease with the size of the market; that is, a monopoly result cannot be excluded even in large markets. In sum, the industrial organisation literature casts some doubt on whether the focus of the analysis should be merely market size. It also confirms that the presence of strategic barriers to entry might imply a highly concentrated structure, irrespectively of the size of the market. Hence, one expects a negative correlation between barriers to entry and the intensity of competition.

The industrial organisation literature also highlights the role of barriers to exit as barriers to entry. In transition economies, barriers to exit are likely to play a very relevant role, because the variety of forms of soft budget constraints allowed inefficient firms to survive and impede the entry of new firms. The presence and toleration of continued soft supports let inefficient firms survive longer, resulting in strong exit barriers. Recent analyses highlight the increasing recourse to such more subtle forms of implicit and indirect subsidies in most transition countries (such as toleration of arrears), particularly but not exclusively in the former Soviet

[2] Given the relevance of the Bertrand and Cournot dichotomy in theory of industrial organisation, a number of studies focused on a comparison between Bertrand and Cournot outcomes. The Singh and Vives (1984) result has been recently extended without need of either kind of complementarity between products by Amir et al. (2001).

Union.[3] The reduction of barriers to exit through the imposition of hard budget constraints is expected to be positively correlated to higher intensity of competition.

Lastly, we are also able to control for ownership, size and age effect. Regarding ownership, we expect de novo and privatised enterprises to face a more competitive structure than state-owned enterprises, because of the legacy of initial monopolistic structure by state-owned enterprises. Size is expected to be negatively correlated with the intensity of competition, to the extent that larger firms are more likely to exert market power. Gibrat's law suggests that entry is more likely to occur into smaller size classes and the likelihood of exit declines as a firm's size increases.[4] Regarding age, results can go both ways, taking into account the fact that small enterprises were rare under central planning. Therefore, it may be natural to expect an initial concentrated structure as new small enterprises enter and fill new niches, followed by more extensive competition and slow-down in growth.[5] On the other hand, we can expect the initial structure to be more competitive and less distorted than that of state-owned enterprises.

[3] On barter and non-monetary transactions, see Carlin et al. (2000) and Commander and Mumssen (2000), and on soft budget constraints more generally see Djankov and Murrell (2001).

[4] See Sutton (1997) for a comprehensive review and test of Gibrat's Law.

[5] See Konings et al. (1996).

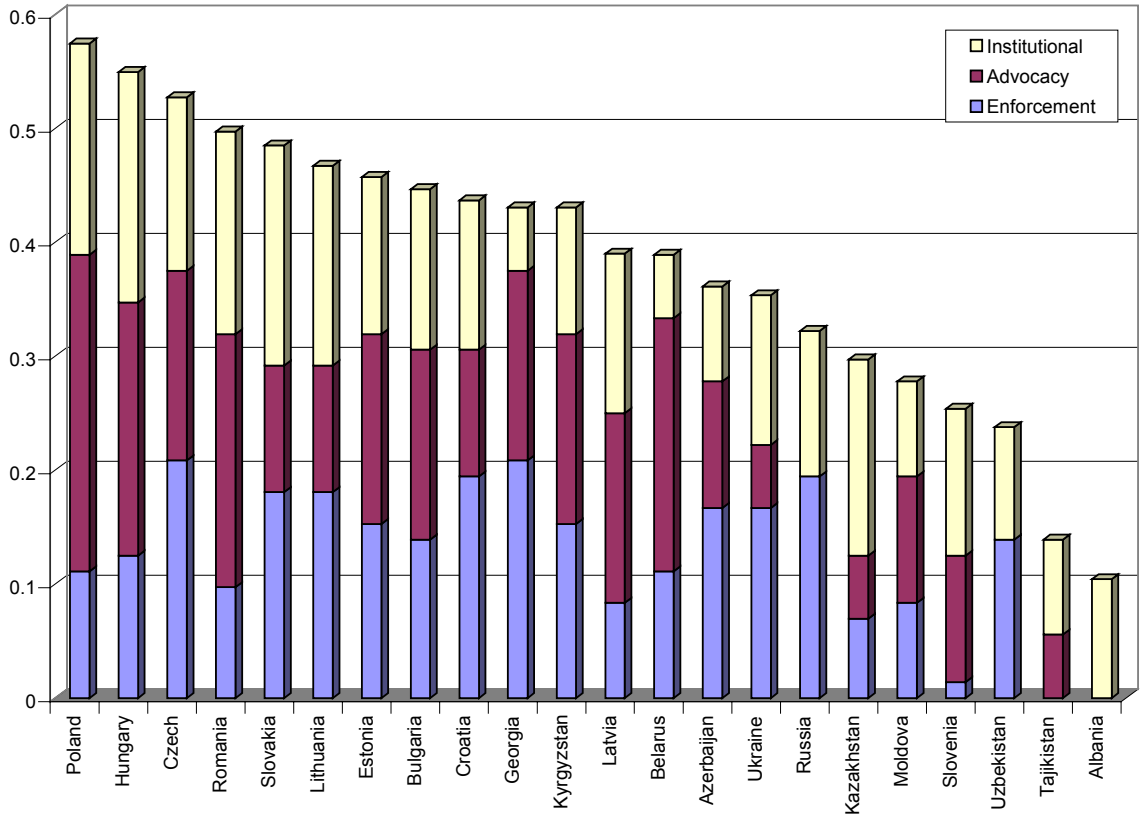
3. DESCRIPTION OF POLICY AND ENTERPRISE-LEVEL DATA

This section describes in detail the key variables used in the econometric analysis, starting with the policy variables and then turning to the enterprise-level variables.

POLICY VARIABLES

Chart 1 reports all countries ranked by the raw scores for competition policy implementation (here reported for 1999).[6] This indicator captures ex ante features of implementation of competition policy and it is based only on an assessment of the implementation experience of the transition economies. This indicator has been constructed based on a major survey directed to all competition agencies, supplemented by a separate survey instrument to law practitioners and others familiar with legal practice in the area of competition policy in each country. The indicator is also decomposed by the key dimensions related to enforcement, advocacy and institutional aspects.

Chart 1: Competition policy implementation



Source: The competition policy indicator has been constructed by the author based on joint work with Mark Dutz and is based on a survey to all competition authorities, supplemented by a separate survey to law practitioners and others familiar with legal practice in the area of competition policy in each transition country.

[6] Current period data provide a useful summary statistic for the joint impact of initial period values and interim changes. For a discussion of the construction of the indicator and the rating methodology see Vagliasindi (2002). Earlier studies focused on the Visegrad countries. See Fingleton et al. (1996).

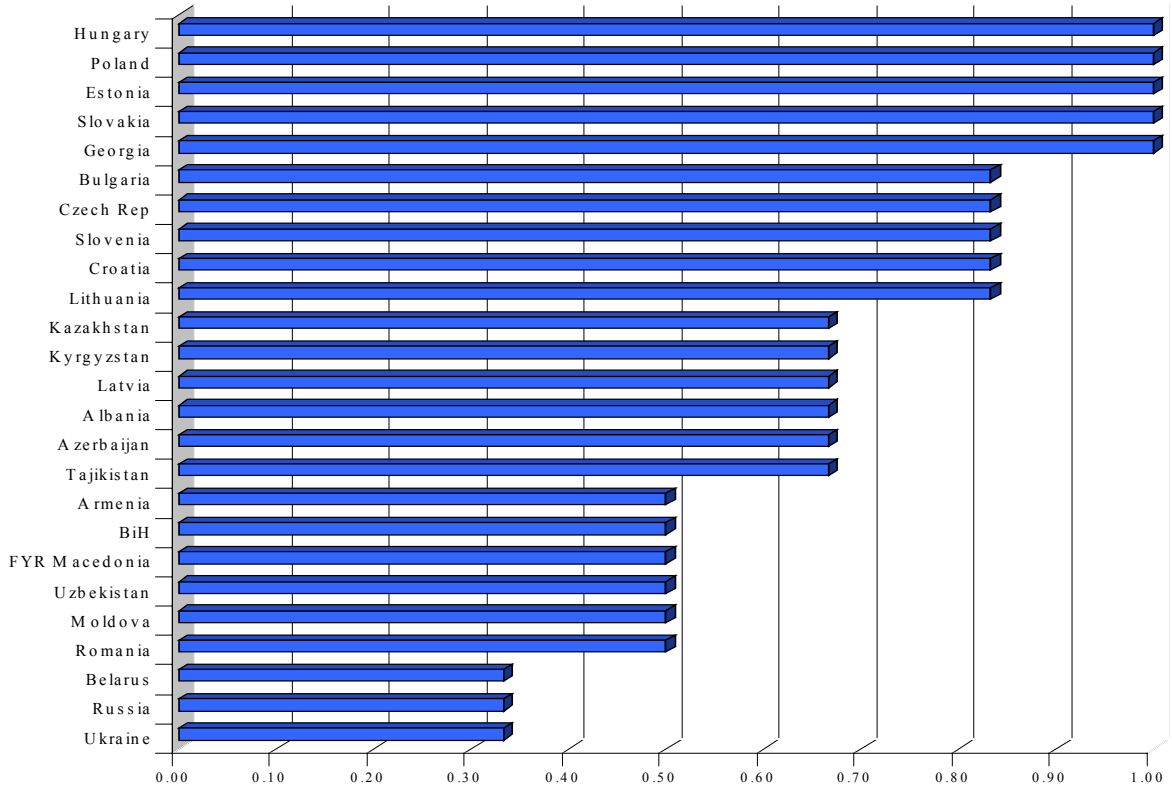
The enforcement category is composed of assessments of the rules and enforcement practices towards anti-competitive acts by enterprises and state executive bodies, plus relevant fines. The advocacy category assesses the impact of the agencies in introducing pro-competitive modifications to rules concerning a broad range of economic policies affecting competition, specifically the regulation of infrastructure sectors and privatisation policies, and education and constituency-building efforts. Lastly, the institutional category is based on assessments of the degree of political independence of the competition authorities, the transparency of the agency and the effectiveness of the appeals process.

As evident from Chart 1, the Visegrad countries, the Baltic states and Romania have the most effective overall implementation of competition policy according to this measure. They also exhibit the most balanced "mix" of the three sub-components. On the other hand, Armenia, Albania and Tajikistan had almost no competition policy-related implementation activities. The countries that have not been included in the Chart, Armenia, Bosnia and Herzegovina, FYR Macedonia and Turkmenistan, had not, by 1999, implemented a competition law and consequently have been given a score equal to zero.

Privatisation

An additional exogenous policy-based variable used in the empirical analysis is a lagged indicator of progress in privatisation, estimated in 1997, reported in Chart 2.

Chart 2: Privatisation Transition Indicator



Source: EBRD. The privatisation transition indicator used in this table is based on a qualitative variable scaled scoring from 0 to 1 based on a composite of the small- and large-scale privatisation transition indicators, and indicators of the privatisation revenues and tradability of land rights as reported in EBRD (1999).

This indicator varies from 0 to 1 and reflects the extent of progress towards a share of enterprise assets in private ownership typical of advanced market economies.[7] Progress in privatisation according to this indicator has been most pronounced for the Visegrad countries and the Baltic states, together with Bulgaria, Croatia and Slovenia, whereas it was still lagging in Romania and in the CIS countries. Recent work on the extent and effectiveness of competition advocacy actions related to privatisation across transition economies shows that this policy variable is exogenous to competition policy implementation in terms of its impact on economy-wide competition intensity. To capture trade liberalisation, we use a lagged indicator of import penetration, based on data from EBRD (1999).

ENTERPRISE-LEVEL VARIABLES

In what follows the key enterprise-level variables used in the empirical analysis, which are based on new microeconomic survey data, are described. The main aim of the survey was to shed some light on enterprise behaviour and performance and their relation to competitive pressures, the business environment and the relationship between enterprises and the state.[8] The full sample was over 3,000 enterprises, with private de novo (namely, privately established from the start) being over half of the sample, privatised enterprises (e.g. previously state-owned enterprises) over 30 per cent and the remainder state-owned enterprises.

Intensity of competition

Ideally an appropriate indicator of the intensity of competition is an exogenous variable which determines how competitive the economy is. Many empirical measures of competition are based on endogenous variables like performance indicators, such as firms' profit and revenues. The relationship of these variables with the intensity of competition is non-linear.[9]

The variables that we use to capture the intensity of competition are based on the number of competitors faced by each enterprise in its major product line in the domestic market. Based on a survey question we are able to classify for each enterprise the market structure in which it operates as: (i) a monopoly, (ii) an oligopoly among few, and (iii) a more competitive market structure.

Tables 2a and 2b below provide some basic information on the distribution by ownership, size, and age of the structural concentration indicator used as the dependent variables of the model. In particular, each entry in the following tables indicates the percentage of enterprises defined according to a given variable, depending on the different combinations of size and age classes within each of the three ownership categories. The summary data in bold represent the percentage of enterprises only by size (irrespectively of age) and age (irrespectively of size) within each ownership category. As mentioned earlier, ownership is divided by three types, distinguishing de novo from privatised and state-owned enterprises. Size is divided in four categories (reported in the columns in correspondence of each ownership category) depending on the number of employees: micro-enterprises (e.g. with less than 50 employees), small enterprises (with less than 200 employees), medium-sized enterprises (with less than 500

[7] This variable is a composite of the small- and large-scale privatisation-related transition indicators, an indicator of the privatisation revenues and " tradability" of land rights as reported in EBRD (1999).

[8] The Business Environment and Enterprise Performance Survey (BEEPs) was implemented by the Office of the Chief Economist at the EBRD and the World Bank Institute (WBI) in 1999.

[9] See Boon (2000). This proposition finds empirical evidence in the work of Carlin et al. (2001).

employees) and large enterprises.[10] The variable age is divided in three categories (reported by rows) depending on the year in which the enterprise has been first established: the first one including recent entrants (e.g. enterprises founded in the last three years), enterprise founded after and before 1989 (taken as the start of transition).

The first indicator – as reported in Table 2a – captures the degree of monopolisation of the market, representing the percentage of firms facing no competitor. It is striking to note how the intensity of competition increases sharply moving from de novo – where only slightly more than 5 per cent of enterprises do not face any competitor – to privatised, where the percentage raises to about 10 per cent, and state-owned firms, where notably nearly 30 per cent of enterprises are protected by a monopolistic structure. Within each ownership category there is a substantial variation, as evident from the values of the entries in each size and age combination. Specifically for relatively "older" de novo enterprises the percentage of enterprises enjoying a monopoly structure is substantially higher. There is a positive correlation between concentrated market structure and size. Namely, when recently established de novo enterprises assume bigger dimensions (notably for medium-sized and large categories) they tend to locate in market niches protected by competition.

Table 2a: Distribution of the monopolist structure

Size / Age	De novo					Privatised					Soe				
	1	**2**	**3**	**4**	**Avg**	**1**	**2**	**3**	**4**	**Avg**	**1**	**2**	**3**	**4**	**Avg**
1	4.51	4.84	0.00	95.45	**16.50**	13.56	12.73	4.44	16.67	**11.30**	27.30	34.21	17.65	57.14	**33.80**
2	5.25	5.45	3.70	11.76	**1.33**	7.73	8.90	7.81	17.44	**9.22**	11.76	32.97	20.41	28.89	**27.23**
3	0.00	9.09	0.00	0.00	**2.70**	3.57	1.37	5.56	7.94	**4.66**	33.33	25.71	24.69	26.56	**25.97**
Avg	**1.56**	**3.42**	**1.92**	**75.86**	**5.00**	**8.47**	**8.15**	**6.80**	**13.77**	**8.65**	**20.59**	**28.95**	**22.45**	**30.89**	**27.30**

Source: BEEPs. The summary indicator used in this table is based on a qualitative variable scaled scoring from 1 to 3 if the number of competitors in the main product line is equal to zero, to 2 if it is between one and three, and 3 if is greater than three. It represents the proportion of firms for which the value of this variable is equal to 1.

Privatised enterprises show less variation overall. The percentage of firms facing no competitors is decreasing by age; notably, only about 4 per cent of the enterprises privatised before 1989 are still protected by a monopoly. This can be interpreted that, compared with the other age classes, newly privatised enterprises often still enjoy a monopolistic structure.[11] Similar considerations hold for state-owned enterprises, among which medium-sized and large enterprises – particularly the most recent ones – are less subject to competition.

The second indicator of intensity of competition captures the degree of oligopolistic competition between a small number of enterprises, as it represents the percentage of firms facing between one and three competitors. Table 2b provides additional information on the occurrence of oligopolistic structure, where there is a limited number of competitors (ranging from one to three).

[10] For state-owned enterprises the number of micro and small size enterprises (i.e. with size equal to 1 and 2) is not representative, since the number is less than 10.

[11] It is also interesting to note that large enterprises exhibit a different behaviour from the other size categories.

Table 2b: Distribution of the oligopolistic structure

Size / Age	De novo					Privatised					Soe				
	1	2	3	4	Avg	1	2	3	4	Avg	1	2	3	4	Avg
1	10.99	16.13	28.57	0.00	**10.66**	0.00	3.64	17.78	16.67	**7.34**	0.00	21.05	17.65	14.29	**18.31**
2	9.84	16.36	12.35	29.41	**11.80**	8.64	17.18	14.06	13.95	**13.83**	29.41	14.29	18.37	17.78	**17.33**
3	15.38	13.64	30.00	33.33	**17.57**	3.57	10.96	18.06	19.05	**14.41**	6.67	13.71	17.28	25.00	**16.42**
Avg	**10.60**	**16.52**	**16.35**	**6.90**	**11.73**	**6.51**	**14.54**	**15.53**	**16.17**	**13.02**	**17.65**	**14.80**	**17.69**	**21.14**	**16.94**

Source: BEEPs. The summary indicator used in this table is based on a qualitative variable scaled scoring from 1 to 3 if the number of competitors in the main product line is equal to zero, to 2 if it is between one and three, and 3 if is greater than three. It represents the proportion of firms for which the value of this variable is equal to 2.

It is interesting to note that there is substantially less variation across different ownership types. A similar percentage of de novo and privatised enterprises (respectively close to 12 and 13 per cent) are characterised by an oligopolistic structure, whereas a higher percentage of state-owned enterprises (close to 17 per cent) enjoy oligopolistic power. The distribution by size and age follow a similar pattern to the one analysed before. In particular, both de novo and privatised enterprises founded before 1989 still exhibit the strongest protection from full competition. Concerning state-owned enterprises, the relationship with age reverses and it appears that more recently established state-owned enterprises are more present within an oligopolistic structure than older ones. In the model presented in Section 4 below the intensity of competition represents the dependent variable of the econometric model. The following tables are constructed in a similar way and report the distribution by ownership, size, age and by the key explanatory variables used in the model.

Demand elasticity

Table 3 reports the percentage of firms distinguished by size, age and ownership characterised by a very high degree of market power, perceiving a perfectly inelastic inverse demand function. There is a similar percentage of de novo and privatised firms facing perfect price inelasticity, whereas a substantially higher percentage of state-owned enterprises (around 25 per cent, more than twice than de novo and privatised enterprises) are not concerned by "business stealing" from competitors.

Table 3: Distribution of perceived inelastic demand

Size / Age	De novo					Privatised					Soe				
	1	2	3	4	Avg	1	2	3	4	Avg	1	2	3	4	Avg
1	10.62	9.84	14.29	0.00	**10.55**	14.55	6.12	20.45	35.29	**15.76**	0.00	30.56	17.65	38.46	**27.94**
2	10.20	11.40	11.54	23.53	**10.63**	8.29	15.56	14.29	13.95	**13.14**	25.00	27.06	22.92	34.09	**27.46**
3	33.33	4.76	0.00	0.00	**19.18**	7.41	21.92	24.29	9.52	**17.60**	46.15	22.16	22.22	21.67	**23.05**
Avg	**10.88**	**10.73**	**10.78**	**17.39**	**10.92**	**9.36**	**15.56**	**17.49**	**14.46**	**14.36**	**32.26**	**24.65**	**21.92**	**28.21**	**25.09**

Source: BEEPs. The summary indicator used in this table is based on a qualitative variable scaled scoring from 1 to 4 if enterprises would lose all their customers, suffer modest, slight or no reduction in the volume of sales if they were to raise their prices by 10%. It represents the percentage of firms for which the value of this variable is equal to 2.

Large size is highly positively correlated with high market power. There is also a decreasing relationship with age for both de novo and privatised enterprises, at least between recent entrants and post-transition enterprises.

Entry barriers

Table 4 represents the percentage of firms, by size, age and ownership, that perceive substantial pressures from domestic competitors to reduce the production costs of existing products. This indicator can also be interpreted as measuring the absence (or low values) of entry barriers towards innovation.

As intuition suggests, there the lowest percentage of state-owned enterprises (slightly above 26 per cent) perceives substantial pressures from domestic competitors (or low entry barriers). There is a higher percentage of privatised enterprises that perceive low entry barriers (around 34 per cent) and an even higher percentage of de novo enterprises (nearly 40 per cent).

Among privatised and state-owned enterprises the lowest percentage of enterprises facing substantial domestic competitive pressures (substantially below the mean) is associated with large new entrants.[12] The percentage increases as size becomes smaller. Competitive pressures are also increasing with age, with the only exception being privatised enterprises for which the relationship with age becomes non-linear. The lower percentage of privatised enterprises experiencing low barriers to entry can be interpreted as meaning that the most recent privatisation only implied the transfer of ownership from a public to a private monopoly, protecting enterprises from competitive pressures that would lead to innovation. Among state-owned enterprises the higher percentage of enterprises facing substantial competitive pressures are small and medium-sized and more recent ones.[13]

Table 4: Distribution of entry barriers

Size / Age	De novo					Privatised					Soe				
	1	2	3	4	Avg	1	2	3	4	Avg	1	2	3	4	Avg
1	43.66	31.15	42.86	100.00	**42.21**	43.64	24.49	34.09	23.53	**33.33**	50.00	36.11	29.41	15.38	**30.88**
2	40.39	31.62	35.90	52.94	**38.76**	43.78	31.43	32.80	29.07	**34.82**	43.75	22.35	20.83	20.45	**23.32**
3	38.46	33.33	10.00	0.00	**31.51**	29.63	36.99	30.00	30.16	**32.19**	30.77	26.35	25.93	28.33	**26.79**
Avg	**41.06**	**31.64**	**34.31**	**52.17**	**39.20**	**42.47**	**31.58**	**32.34**	**28.92**	**34.11**	**38.71**	**26.39**	**24.66**	**23.93**	**26.12**

Source: BEEPs. The summary indicator used in this table is based on a qualitative variable scaled from 1 to 4 if the pressure from domestic competitors to reduce production cost of existing products is not at all important, slightly, fairly or very important. It represents the percentage of firms for which the value of this variable is equal to 4.

High entry barriers increase the risk of bottlenecks and give more force to market foreclosure arguments. Accordingly, the reduction of entry barriers is expected to be positively and strongly correlated to a more competitive environment, to the extent that is successfully led to entry of more efficient enterprises.

[12] Notably, medium-sized and large privatised enterprises face substantially below-average competitive pressures.

[13] The legacy of central planning seems particularly strong in that it has implied high barriers to entry for state-owned enterprises established before 1989.

Soft budget constraints

Table 5 represents the percentage of firms by ownership, size and age, that suffer from such a substantial percentage of governmental tax arrears as to be considered unmanageable. The variation across different ownership is significant: arrears are relatively less of a problem for de novo – where only about 5 per cent of enterprises report substantial arrears. It is substantially higher for privatised and state-owned firms – where the percentage rises respectively to about 15 per cent and 13 per cent of enterprises that enjoy such type of soft budget constraint**.** There is also a substantial variation within each ownership category. For both de novo and privatised enterprises increasing size implies substantially higher arrears problems. For state-owned enterprises the relationship with size is less monotonic, possibly reflecting the fact that arrears affect also relatively smaller and younger enterprises given the pervasive nature of implicit and explicit subsidies and other types of privileges. This indicator of soft-budget constraints can be interpreted as reflecting a less effective implementation of policies aimed at reducing implicit and explicit subsidies to loss-making enterprises or otherwise to enterprises that would not survive in the absence of such support.[14]

Table 5: Distribution of soft budget constraints

Size / Age	De novo					Privatised					Soe				
	1	**2**	**3**	**4**	**Avg**	**1**	**2**	**3**	**4**	**Avg**	**1**	**2**	**3**	**4**	**Avg**
1	4.90	5.08	8.33	0.00	**4.99**	13.56	11.76	15.56	17.65	**13.95**	0.00	21.05	14.29	7.69	**16.67**
2	4.07	6.27	7.89	17.65	**4.80**	11.31	16.25	19.46	19.77	**16.01**	11.76	12.79	6.00	6.82	**9.64**
3	5.26	13.64	0.00	0.00	**6.94**	14.29	14.29	12.68	18.64	**14.91**	0.00	14.37	17.95	14.52	**14.64**
Avg	**4.28**	**6.53**	**7.22**	**13.04**	**4.91**	**12.01**	**15.42**	**17.28**	**19.14**	**15.51**	**6.25**	**14.78**	**13.38**	**10.92**	**13.18**

Source: BEEPs. The summary indicator used in this table is based on a qualitative variable scaled from 1 to 4 if the amount of government taxes payments overdue is respectively substantial, manageable, modest or equal to zero. It represents the percentage of firms for which the value of this variable is equal to 4.

The tightening of budget constraints is expected to be positively and strongly correlated to a more competitive environment, to the extent that it successfully leads to exit of less productive enterprises. It is also legitimate to consider this policy-related variable exogenous to competition policy implementation in terms of their impact on economy-wide competition intensity. In fact, across transition economies there has been almost no involvement of competition authorities in advocacy activities related to strengthening competition through the market discipline that harder budget constraints would provide.[15]

[14] For recent evidence on hard budget constraints see Frydman et al. (2000). For an interesting discussion on barter and non-monetary transaction in transition economies see Carlin et al. (2000).

[15] Of all countries, only two, Bulgaria and Croatia, report a minor amount of activity in this area (only two actions each). Carlin and al. (2001) provide an interesting analysis on the appropriateness of using tax arrears as an exogenous measure of soft budget constraints, using the same enterprise survey dataset.

4. REGRESSION RESULTS AT THE ENTERPRISE LEVEL

This section explores the extent to which more effective competition policy implementation and changes in implementation are positively associated with higher intensity of competition. The empirical results in this section are based on the two exogenous policy variables plus the main indicators of barriers to entry and exit and other control variables derived from enterprise-level data as presented in the previous section. Equations (1)-(4) in Table 6 report the result of ordinary two-outcomes probit regressions, where the dependent variable *Comp* captures how the intensity of competition can result in two outcomes: either the absence of competitors (with an associated value of *Comp* equal to 0) or a more competitive environment, with at least one competitor (with an associated value of *Comp* equal to 1).

To reflect the different initial conditions in competition policy implementation a lagged policy variable (*CP-Impl(-2)*) is used. To capture and explore the possible separate effect of changes in implementation of competition policy a variable equal to its percentage change in the intervening period (*CP-Impl-%dif*) is included.

In equation (1) *CP-Impl(-2)* and *Impl-diff%* represent the only explanatory variables. The relation between implementation and intensity of competition is positive and highly significant at the 1 per cent level. Changes in implementation are also positive and significantly (at the 1 per cent level) correlated to a higher intensity of competition, reflecting the fact that recent improvements in implementation practices are starting to have an impact. Regarding the alternative policy variables used, import penetration is never significant and privatisation policies have had a negative impact on competition, as reflected by the negative size of its coefficient – significant at the 1 per cent level.[16] This finding strongly corroborates the poor achievements of competition agencies in influencing privatisation outcomes in more competition-friendly directions.

The positive and highly significant relationship between competition policy and intensity of competition still holds when a basic model – consisting of a set of three enterprise-level variables – is characterised by a relatively high goodness of fit. It is striking to note that whereas all the additional enterprise-level variables are highly significant and confirm the expected results (as highlighted in Section 2), the two competition policy indicators (*CP-Impl(-2)* and *Impl-diff%*) still have a powerful impact on the intensity of competition

The interpretation of the basic model is as follows. As expected, lower barriers to exit and entry (as captured by the perception of lower domestic competitive pressures to innovation and higher hard budget constraints) are positively related to the intensity of competition. The three dummies capturing progressively reductions in entry barriers – relative to the omitted dummy representing the highest level of entry barriers – are all positively and very significantly related to higher intensity of competition. The imposition of hard budget constraint is also significantly related to higher intensity of competition. Higher values of the perceived elasticity of demand – relative to the omitted dummy representing the case of perfectly inelastic demand – are also positively related to competition, in line with theoretical predictions.

[16] It is worth noticing that the significantly negative sign of the privatisation coefficient holds independently from the presence of other policy indicators and controls. It is interesting to note that in a different context the effect of ownership changes on the performance of affected firms has proved to be ambiguous. See Carlin et al. (2001) for an interesting discussion of their results, showing the lack of any significant relationship between privatisation and enterprise performance.

Table 6: The impact of competition policy on the intensity of competition

Probit regressions (standard errors in parentheses)

COMP	(1)	(2)	(3)	(4)
Exogenous policy variables				
CP- Impl(-2)	0.184*** (0.032)	0.147*** (0.027)	0.138*** (0.026)	0.141*** (0.028)
Impl-diff%	0.110*** (0.036)	0.129*** (0.031)	0.120*** (0.029)	0.100*** (0.032)
Imp Pen	0.015 (0.035)	0.028 (0.028)	0.036 (0.028)	0.026 (0.029)
Priv(-2)	-0.103*** (0.003)	-0.103*** (0.002)	-0.090*** (0.020)	-0.084*** (0.031)
Barriers to exit and entry				
Medium entry barrier		0.064*** (0.006)	0.057*** (0.006)	0.056*** (0.006)
Low entry barrier		0.082*** (0.007)	0.072*** (0.007)	0.072*** (0.007)
No entry barrier		0.090*** (0.007)	0.080*** (0.006)	0.080*** (0.007)
HBC		0.015*** (0.003)	0.011** (0.003)	0.008** (0.004)
Elasticity of demand				
High elasticity of demand		-0.053*** (0.014)	-0.045*** (0.013)	-0.039*** (0.014)
Medium elasticity of demand		0.056*** (0.014)	-0.045*** (0.013)	-0.044*** (0.014)
Low elasticity of demand		0.114*** (0.021)	-0.088*** (0.020)	-0.087*** (0.020)
Basic control variables				
De novo			0.088*** (0.013)	0.083*** (0.013)
Priv			0.058*** (0.008)	0.054*** (0.008)
Size			-0.031*** (0.015)	-0.034*** (0.016)
Age-new			-0.023* (0.016)	-0.027* (0.017)
Age-med			- 0.020** (0.009)	-0.017* (0.009)
Sectoral and location controls				
Man				-0.019*** (0.008)
Location				-0.009*** (0.002)
N	3949	3574	3554	3229
χ^2	37.65***	339.61***	418.68***	408.92***
Log-likelihood	1234.11	881.90	835.84	752.37
Pseudo R^2	0.0150	0.1615	0.2003	0.2137

Notes: *** indicates significance at 1% level, ** at 5%, * at 10%. “Comp” (the binary variable equal to 0 if the number of competitors is equal to 0, 1 if it is at least equal to 1), “HBC” (the ordinal variable scoring from 1 to 4 if the amount of government taxes payments overdue is respectively substantial, manageable, modest or equal to 0), “Entry barrier” (the dummies equal to 1 if the pressure from domestic competitors for reducing production costs for existing products is slightly, fairly or very important with respect to the reference category of not at all important), “Elasticity of demand” (the dummies equal to 1 if enterprises would suffer modest, slight or no reduction in the volume of sales if they were to raise their prices by 10% with respect to the reference category or lose all their customers), “De novo” and “Priv” are the ownership dummies (equal to 1 if the enterprise is respectively a newly established firm or privatised with respect to the reference of state-owned enterprise), "Man" is a sectoral dummy (equal to 1 if the enterprise belongs to the manufacturing sector, 0 if to the service sector) based on BEEPs. "CP-impl(t-2)" and "CP-diff%" refer to the overall beginning-of-period competition policy implementation indicator and its percentage change. "Priv(t-2)" is the beginning-of-period transition indicator reflecting progress in privatisation. All regressions are based on enterprise-level variables for Albania, Armenia, Azerbaijan, Belarus, Bosnia and Republika Srpska, Bulgaria, Croatia, Czech Republic, Estonia, Georgia, Hungary, Kazakhstan, Kyrgyzstan, Latvia, Lithuania, FYR Macedonia, Moldova, Poland, Romania, Russia, Slovak Republic, Slovenia, Ukraine and Uzbekistan.

Equation (3) includes as control variables at the enterprise level ownership *"De novo"*, *"Priv"* (relative to state-owned enterprises) and *"Size"* and *"Age"* dummies. Notably as expected, de novo enterprises face a greater intensity of competition with respect to the reference category of privatised and state-owned enterprises.[17] There is little doubt that state-owned and privatised enterprises are better protected by competition due to implicit and explicit subsidies and an uneven playing field tilted against de novo. Size is also very significant at 1 per cent confidence level and negatively correlated to a higher intensity of competition. Age and size are never significant. Lastly, equation (4) also controls for sectoral effects and location. It is interesting to note that trade and service industries are more open to competition with respect to manufacturing.

The econometric results are robust to different specification of the basic models (as summarised by equations (1) to (4)) where an alternate measure of entry barriers towards the development of new markets and product is used. In order to test the robustness of the basic model to the specification of competitive outcome, in what follows an intermediate oligopoly structure with a limited number of competitors (between one and three) is introduced. To deal with this three-outcomes model (0 in the case of no competitors, 1 with one to three competitors, and 2 with more than three competitors) an ordered probit regression and a multinomial logit regression are used. The results – reported in Tables 7 and 8 – are very similar to the previous ones. Notably, also in this new alternative specification of the model the two competition policy indicators (*CP-Impl(-2)* and *Impl-diff%*) seem to have the strongest impact on more competitive outcomes.

[17] There is a statistically significant (at 1% level) difference between de novo and privatised enterprise in equations (3) and (4).

Table 7: The impact of competition policy on structural concentration
Ordered probit regressions (standard errors in parentheses)

COMP	(1)	(2)	(3)	(4)
Exogenous policy variables				
CP- Impl(-2)	0.846*** (0.153)	0.994*** (0.172)	0.970*** (0.174)	0.982*** (0.191)
Impl-diff%	0.396*** (0.166)	0.632*** (0.184)	0.659*** (0.185)	0.570*** (0.212)
Imp Pen	-0.100 (0.179)	-0.062 (0.176)	0.218 (0.205)	-0.150 (0.192)
Priv(-2)	-0.466*** (0.012)	-0.780*** (0.013)	-0.713*** (0.133)	-0.646*** (0.014)
Barriers to exit and entry				
Medium entry barrier		0.562*** (0.065)	0.535*** (0.066)	0.537*** (0.069)
Low entry barrier		0.695*** (0.063)	0.651*** (0.064)	0.671*** (0.067)
Zero entry barrier		0.973*** (0.072)	0.918*** (0.073)	0.991*** (0.078)
HBC		0.112*** (0.023)	0.093*** (0.023)	0.082*** (0.025)
Elasticity of demand				
High elasticity of demand		-0.376*** (0.072)	-0.535*** (0.066)	-0.339*** (0.068)
Medium elasticity of demand		-0.361*** (0.064)	-0.651*** (0.064)	-0.308*** (0.068)
Low elasticity of demand		-0.612*** (0.073)	-0.918*** (0.073)	-0.548*** (0.078)
Control variables				
De novo			0.606*** (0.075)	0.542*** (0.079)
Priv			0.553*** (0.073)	0.515*** (0.079)
Size			-0.295** (0.082)	-0.229*** (0.086)
Age-new			-0.131 (0.087)	-0.089 (0.094)
Age-med			-0.124 (0.072)	-0.083 (0.076)
Sectoral dummies				
Man				-0.218*** (0.054)
Location				-0.042*** (0.016)
N	3949	3574	3554	3229
χ^2	40.71***	410.28***	512.15***	508.63***
Log-likelihood	2698.18	2199.48	2133.49	1916.492
Pseudo R^2	0.0075	0.0853	0.1072	0.1172

Notes: *** indicates significance at 1% level, ** at 5%, * at 10%. "Comp" (the ordinal variable equal to 1 if the number of competitors is equal to 0, 2 if it is between 1 and 3 competitors, and 3 if is greater than 3), See previous table for explanation of the other variables.

Table 8: The impact of competition policy on structural concentration
Multinomial logit regressions (standard errors in parentheses)

COMP	(1)	(2)	(3)	(4)
Exogenous policy variables				
CP- Impl(-2)	-2.209*** (0.377)	-2.924*** (0.462)	-2.866*** (0.481)	-2.976*** (0.527)
Impl-diff%	-1.260*** (0.434)	-2.377*** (0.525)	-2.305*** (0.534)	-1.930*** (0.588)
Imp Pen	-0.108 (0.407)	-0.377 (0.484)	-0.588 (0.509)	-0.334 (0.547)
Priv(-2)	1.278*** (0.313)	2.116*** (0.361)	1.922*** (0.374)	1.888*** (0.400)
Barriers to exit and entry				
Medium entry barrier		-1.400*** (0.176)	-1.400*** (0.176)	-1.417*** (0.185)
Low entry barrier		-1.796*** (0.187)	-1.796*** (0.187)	-1.824*** (0.195)
Zero entry barrier		-2.451*** (0.260)	-2.451*** (0.260)	-2.537*** (0.260)
HBC		-0.224*** (0.061)	-0.224*** (0.061)	-0.172*** (0.066)
Elasticity of demand				
High elasticity of demand		0.868*** (0.194)	0.810*** (0.199)	0.772*** (0.208)
Medium elasticity of demand		0.893*** (0.189)	0.792*** (0.194)	0.776*** (0.200)
Low elasticity of demand		1.450*** (0.195)	1.294*** (0.200)	1.273*** (0.209)
Control variables				
De Novo			-1.589*** (0.190)	-1.488*** (0.209)
Priv			-1.279*** (0.181)	-1.250*** (0.197)
Size			0.574*** (0.200)	0.610*** (0.210)
Age-new			0.447** (0.230)	0.463** (0.241)
Age-med			0.407* (0.186)	0.324* (0.198)
Sectoral dummies				
Man				0.437*** (0.150)
Location				0.148*** (0.046)

Table 8…Ctd

The impact of competition policy on structural concentration

COMP	(1)	(2)	(3)	(4)
Exogenous policy variables				
CP- Impl(-2)	-0.601* (0.340)	-1.030*** (0.403)	-1.022*** (0.369)	-0.925*** (0.403)
Impl-diff%	-0.010 (0.356)	-0.164 (0.378)	-0.200 (0.381)	-0.227 (0.436)
Imp Pen	0.548 (0.348)	0.599* (0.368)	0.526 (0.373)	0.932** (0.400)
Priv(-2)	0.345 (0.262)	0.935*** (0.281)	0.889*** (0.283)	0.466*** (0.030)
Barriers to exit and entry				
Medium entry barrier		-0.316** (0.148)	-0.324** (0.140)	-0.316** (0.148)
Low entry barrier		-0.510*** (0.137)	-0.494*** (0.138)	-0.510*** (0.150)
Zero entry barrier		-1.000*** (0.159)	-0.968*** (0.160)	-1.116*** (0.172)
HBC		-0.135*** (0.048)	-0.121** (0.050)	-0.118** (0.054)
Elasticity of demand				
High elasticity of demand		0.572*** (0.136)	0.576*** (0.137)	0.571*** (0.144)
Medium elasticity of demand		0.506*** (0.137)	0.473*** (0.138)	0.410*** (0.146)
Low elasticity of demand		0.754*** (0.159)	0.720*** (0.161)	0.708*** (0.170)
Control variables				
De novo			-0.512** (0.163)	-0.385** (0.174)
Priv			-0.540*** (0.159)	-0.431*** (0.172)
Size			0.504*** (0.175)	0.464*** (0.185)
Age-new			-0.107 (0.188)	-0.077 (0.205)
Age-med			0.101 (0.154)	0.036 (0.163)
Sectoral dummies				
Man				0.406*** (0.115)
Location				0.008 (0.034)
N	3949	3574	3554	3229
χ^2	46.71***	449.71***	554.96***	554.67***
Log-likelihood	2695.18	2179.37	2112.08	1916.48
Pseudo R^2	0.0086	0.0935	0.1161	0.1278

Notes: *** indicates significance at 1% level, ** at 5%, * at 10%. “Comp” (the ordinal variable equal to 1 if the number of competitors is equal to 0, 2 if it is between 1 and 3 competitors, and 3 if is greater than 3). The first (and second) half of the table compares outcome 1 (2) with outcome 3. See previous table for explanation of the other variables.

The interpretation of the basic model is the same as above. As in the basic model, the econometric results discussed above also hold when in regressions (1) to (4) the alternate measures of entry barriers are used.[18] However, there are a number of different results that deserve to be highlighted. For instance, life cycle effects through age lose their significance, as evident from Table 7. An analysis of the multinomial regression reported in Table 8 shows also that age is significant only when we compare a monopolistic structure with a fully-fledged competitive one, whereas it is not in the case of an oligopolistic structure versus a fully-fledged competitive one.

Before concluding, it is also worth mentioning the strong correlation of the two competition policy indicators (*CP-Impl(-2)* and *Impl-diff%*) with the intensity of competition. To test whether policies hardening budget constraints and reducing barriers to entry have been effective, the same models has been run by adding additional country variables based on the country average of *HBC* and *Entry*. Interestingly, only hard budget constraints have proved to be effective, whereas there is no evidence of coherent national policies aimed at reducing barriers to entry. Lastly, the model is robust to additional control variables, such as GDP per capita and regional dummies.

[18] The model is robust to a different specification of the underlying distribution, where logit and ordered logit regressions are used to estimate the model.

5. CONCLUSION

The novelty of this paper arises from the careful analysis of the main policy and structural determinants of the intensity of competition at the enterprise level across transition economies. It explores the relative importance of cross-country and within country variations on a variable capturing intensity of competition in domestic markets. An important finding is that competition policy implementation and changes in its implementation (at the country level) are significantly and positively correlated with the intensity of competition. This result is particularly robust, since the result does not change with the introduction of other policy-level controls and alternate specifications of the basic model. Other results at the micro level include a strong positive relationship of the intensity of competition and lower barriers to entry and exit and higher perceived elasticity of demand. There is also evidence on the relatively poor achievements of privatisation policies in the way of achieving more competitive market outcomes.

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