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A Panel Data Analysis**

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Effectiveness of Competition Law: A Panel Data Analysis

Abstract

The paper explores what macroeconomic factors can tell us about the effectiveness of recently enacted national competition laws. Qualitative evidence suggests that numerous countries fall short in implementing competition law. Furthermore, there seems to be significant differences between countries. To examine what factors might contribute to the explanation of effectiveness of competition law panel regression analysis is used. The results indicate that the level of economic development matters, however the institutional learning curve is also relevant. Furthermore, larger countries should be more concerned with competition advocacy activities than smaller countries and it seems to be the case that the problem of capture of competition law is serious in countries with high levels of corruption.

Keywords: Competition law enforcement, developing and transition countries

JEL-Codes: K21, L40

Zusammenfassung

Die Studie untersucht welche Faktoren die Effektivität von jüngst eingeführten Wettbewerbsgesetzen beeinflusst. Qualitative Studien zeigen, dass die Effektivität des Wettbewerbsrechts in zahlreichen Ländern zu wünschen übrig lässt. Ferner zeigt sich, dass es bedeutende Unterschiede zwischen den Ländern hinsichtlich der Effektivität der Wettbewerbsgesetze gibt. Um zu untersuchen, welche Faktoren die Effektivität von Wettbewerbsgesetzen beeinflussen, wird die Methode der Panel Daten Analyse verwendet. Die Ergebnisse zeigen, dass der wirtschaftliche Entwicklungsstand von Bedeutung ist, aber auch dass Lerneffekte eine Rolle spielen. Ferner zeigt sich, dass größere Länder der Informationspolitik größere Bedeutung beimessen sollten als kleinere Länder. Außerdem deuten die Ergebnisse darauf hin, dass Korruption ein ernsthaftes Problem für die effektive Implementierung von Wettbewerbsgesetzen sein kann.

Schlagwörter: Wettbewerbsrecht, Entwicklungs- und Transformationsländer

JEL-Codes: K21, L40

1 Introduction

In recent decades a vast proliferation of national competition laws can be observed. More and more states enacted a law that can be defined “as the set of rules and disciplines maintained by governments relating either to agreements between firms that restrict competition or to the abuse of a dominant position (including attempts to create a dominant position through mergers)” (Hoekman & Holmes 1999, p. 877). Rules commonly included in these competition laws are provisions on (i) horizontal restraints or cartels, (ii) vertical restraints, (iii) abuse of dominant position or monopolization, and (iv) mergers and acquisitions (see e.g. WTO 2003). In particular, until 1979 only around 24 countries had competition law, most of them developed countries. In the 1980s a further seven countries implemented competition law. Since then countries that controlled restrictive business practice by competition law increased considerably. From 1990 to 1999 around 58 countries took the step of enacting competition law. Since 2000 a further 13 countries enacted such a law. Especially, since the 1990s, a lot of developing and transition countries took the step of enactment. All in all, today around 102 countries have competition law (see Annex 1)¹.

To pass a competition law signifies not necessarily that this law is effectively enforced. Country specific factors like stage of economic development, and economic and political realities are likely to have a significant impact on effective enforcement. Qualitative empirical evidence indicates that numerous countries that recently enacted competition law fall short in implementing their competition law effectively and that there are some differences between countries. For example, CUTS, who reviewed the competition regimes of India, Kenya, Pakistan, South Africa, Sri Lanka, Tanzania, and Zambia, states that the competition regimes “in most of the countries selected [...] are quite ineffective” (CUTS 2003b, p. 1). Another in-depth analysis of the competition policies of eighteen transition countries by Dutz and Vagliasindi (2000, pp. 4-5) indicates that, within this sample, Poland, Hungary, Lithuania, Romania, and Estonia have so far the most effective competition policy. Hölscher and Stephan (2004, pp. 335-43), reviewing the competition policies of the Czech Republic, Hungary, Poland, Romania, and Slovenia, suggest that the competition policies of these countries are to some extent well under way. However, they concede that some deficits remain, for example in the institutional settings of Romania and Poland. Furthermore, available indicators on the effectiveness of competition policy (see Annex 2 and 3) indicate that in

¹ The exact number is difficult to determine. However, *Kronthaler and Stephan (2007)* provide an actual overview of which countries can be considered to have competition law. Furthermore, it is sometimes difficult to determine when a country enacted its competition law for the first time. For example Poland enacted its first competition laws in 1933 (The Act on Cartels) and 1939 (The Antimonopoly Act). These laws, however, were abrogated during socialism. In 1990 Poland enacted a serious competition law again.

a lot of countries competition policy is quite ineffective, however, with some differences between countries.

The objective of the present study is to examine what factors contribute to effective competition law implementation of recently enacted national competition laws. To examine this, panel estimation technique is used. In the best case, the estimation equations would be embedded in a structural model and derived rigorously. However, due to the lack of a structural model exploratory data analysis is used. This, with the hope to provide other researchers and practitioner's helpful insights what contributes to effective implementation of competition law. Literature, however, leads us not complete guideless. First, there are many qualitative studies, which give hints what factors might influence effective competition law implementation (e.g. Khemani & Dutz 1995; WTO 1998; Laffont 1999; CUTS 2003b; Mehta 2003; Contributions to the OECD Global Fora on Competition²). Second, two empirical studies (Palim 1998 and Kronthaler & Stephan 2007) exist that examine on the basis of reasons for and against competition law what influences the probability that a country enacts such a law. These two studies can be used beside the qualitative studies as good guides which determinants should be included in our analysis. The main idea behind this is that the reasons against and for enactment of competition law may be prevalent within the respective country even after enactment and might influence effective implementation of competition law.

To the best of our knowledge this is one of the first quantitative empirical studies with this approach. So far there exists only one attempt in this direction, a study by Lee (2005). This study focuses on legal tradition, which is not found to contribute to the explanation of competition law enforcement³ (see Lee 2005, pp. 245-56).

Section 2 discusses the factors that might influence effective enforcement of competition law. Section 3 describes the estimation method, the data used and discusses the empirical results. Section 4 summarizes the findings and draws some conclusions.

² Contributions to the several OECD Global Fora on Competition can be found at http://www.oecd.org/document/60/0,2340,en_2649_37463_2732220_1_1_1_37463,00.html. For an analysis of the contributions to the OECD Global Fora on Competition see Kronthaler et al. (2005).

³ Additionally to legal tradition the study controls for level of economic development, budget per staff, and the age of the competition law.

2 Macroeconomic factors that might contribute to effective competition law implementation

As indicated above, the qualitative studies, Palim (1998) as well as Kronthaler and Stephan (2007) can be used as good guides which factors should be considered when examine exploratory what determinants might have an impact on effective enforcement of competition law. In particular, these studies indicate that the level of economic development, the size of an economy, transition and economic reforms, foreign direct investment, sectoral structure, economic activity of the state, openness to trade, international organizations, membership in regional trade agreements, and corruption might have an impact on effective enforcement of competition law. In the following, these factors are discussed with regard to effective enforcement of competition law.

Starting with the level of economic development there might be good reasons that the level of economic development not only influences the probability of enacting competition law, but also effective implementation. In particular, poorer countries may rely more on interventionist development policies, have greater problems with competing priorities, like social policies which might be more relevant than competition law, and have more difficulties in the implementation process, e.g. resources are scarcer, juridical systems are less developed, academic infrastructure is less advanced, etc. (see Khemani & Dutz 1995, p. 27; Laffont 1999, p. 252; CUTS 2003b, p. 1; Mehta 2003, pp. 14-5). Thus, the level of economic development may be a determinant that influence whether a competition law is effectively enforced or not.

The size of the economy might be a further factor that influence whether a country enforce its competition law or not. There are mainly two reasons. First, small economies normally have small domestic markets, which do not allow numerous firms to produce at the necessary firm size to use economies of scale. Hence, mergers and acquisitions as well as a certain concentration is seen as necessary with a view to efficiency, welfare, and international competitiveness (see e.g. Evenett 2003, p. 21; Gal 2001, p. 1445). In short, it is claimed that benefits from economies of scale exceed the benefits of a competition law (see e.g. Langhammer 2000). Second, it is argued that small open economies are exposed to competition from abroad. Thus, it is argued that a competition law is not necessary to discipline markets. Both reasons indicate that effective enforcement of competition law might be not seen as a necessity or that there might be stronger resistance against effective enforcement in smaller countries than in larger countries. However, the academic literature indicates too that there might be reasons why small countries should enforce competition law. In particular, it is argued that entry barriers in small economies are relatively higher compared to larger economies and that the 'invisible hand' is much weaker. The reasons are manifold. Scale economies might allow market entry only when the entrant can skim a sufficiently large domestic demand. Small population size constrains human capital and the availability of skilled

labour. Natural resources may be limited to some extent. Additionally, the business community might be much more interconnected. Hence, the possibility to enter a market is restrained due to personal proximity (Gal 2001, pp. 1447-8).

Economic reforms can be a further factor, which have an impact on effective enforcement of competition law. The point is that, since the seventies, and especially with the demise of the central planning system, state-governance of developing and transition economies is increasingly replaced by stronger adherence to market-based economies. In this respect it is increasingly recognized that privatisation, deregulation, and trade liberalisation alone are not sufficient to increase the efficiency of the economy. These policies have to be supplemented by competition law and competition policy to realise the maximum possible benefits (see e.g. CUTS 2003a, p. 17; WTO 1998, pp. 3-4). This suggests that countries, which implement economic reforms are concerned with effective enforcement of competition law. However, in the literature it is sometimes observed that countries which are undergoing economic reforms fear that competition law and its enforcement take away scarce resources from higher priorities like privatisation, deregulation, and building the relevant institutions (see e.g. Kovacic 2001, pp. 288-9).

Fourthly, there might be a relationship between the importance of foreign direct investment for capital accumulation and enforcement of competition law. The point is that countries for which foreign direct investment is of great importance for capital accumulation might enforce competition law more effectively in order to provide a market-oriented and transparent framework which increases the investors' reliance in the economy and reduces transaction costs (see WTO 1998, pp. 8-9). However, in particular in developing countries it is sometimes feared that competition law may negatively affect the inflow of foreign direct investment as it reduces the possibility of preferential treatment to attract foreign direct investors. Hence, some countries for which foreign direct investment is of great importance might shy away from effective enforcement of competition law.

Another factor, discussed in the literature, which might influence effective enforcement of competition law, is the level of industrialisation. First, it is suggested that concerns on competition may increase with the country's level of industrialisation, because in pre-industrialised societies, the necessity of protecting competition is often not recognised, whereas in industrialised economies, the perception of the need to protect competition between different competitors increase (Cira 1982, pp. 30-1). Second, developing countries in which support is strong to reach and maintain a high level of industrialisation may not effectively apply competition law due to concerns that competition law might compromise their established industries.

Furthermore, there might be a relationship between economic activity of the state and effective enforcement of competition law. The higher the state dominated share of economic activity in the economy is the lesser the state might be concerned about

effective enforcement of competition law. Markets play a less decisive role in countries where the state-dominated share of economic activity is larger. Furthermore, the more the state is involved in economic activity, e.g. through state-owned enterprises, the lesser it is interested to control its own activities through competition law and independent competition authorities. Hence, the state may not be too concerned about effective implementation of competition law.

Another point intensively discussed in the literature is trade liberalisation. Sometimes it is argued that trade liberalisation is sufficient to increase competition and a competition law is not necessary. This point potentially dates back to a study by Dixit (1984). However, trade liberalisation is not necessarily a substitute to competition law. In the literature competition law is also discussed as a complement to trade liberalisation in increasing efficiency, consumer welfare, growth, and development. Trade liberalisation promotes these objectives through reducing government-imposed barriers to international trade, whereas competition law addresses anti-competitive practices of enterprises that impede access to markets or distort their efficient functioning (see e.g. WTO 1998, pp. 11-2). Furthermore, it is discussed that with increasing openness the perceived need within an economy for an effective competition law increases to protect domestic enterprises from global competition (Shughart et al. 1995, p. 187) or from potential abuses of market power by multinational enterprises and cartels (Kronthaler et al. 2005, pp. 19-22).

Furthermore, corruption might influence effectiveness of competition law. First, countries in which corruption is high might use competition law as a remedy against corruption and bribes (see e.g. Kovacic 2001, pp. 296-7) and are especially concerned with implementation of competition law. Second, pressure groups might try to prevent effective enforcement of a law that could control as much as restrict their own activities or try to use competition law for their own interests.

Implementation of competition law may not only be driven internally but also from outside a country. Two particular points are the potential influence of donors and regional trade agreements.

With respect to donors it is suggested that they are interested in that countries enact and enforce competition law. In particular, since the 1990s various international initiatives in promoting competition law can be observed. For example the Organisation for Economic Co-operation and Development (OECD) began the discussion on the issue of competition policy with non-OECD members in 1989 (OECD 1996, p. 7). Since then the issue was been discussed in several conferences, including six 'Global Fora on Competition' in which many developing and transition countries took part. The United Nations Conference on Trade and Development (UNCTAD) is also active in promoting competition law in developing and transition countries. Its work on the issue of competition law dates back until the late 1970s and up to now UNCTAD provides technical assistance for countries with respect to competition law initiatives.

Furthermore, the World Bank as well as the International Monetary Fund (IMF) are interested in the issue of competition law. In this respect it is reported by the representative of South Africa to the 'Third Global Fora on Competition' that "there are some countries whose competition laws have been introduced at the insistence of the IMF" (Lewis 2003, p. 2).

The second relevant external force is membership in regional trade agreements. In particular, regional trade agreements may be interested in whether a competition law is efficiently enforced. For example, the EU pays vast attention to whether a competition law is efficiently enforced in new member states and provides assistance for improving the enforcement mechanisms of competition law, e.g. through the European Competition Network (ECN). The same is valid to some extent for other regional trade agreements. For example: the North American Free Trade Agreement (NAFTA) obliged member countries to adopt or maintain measures against anti-competitive business actions (Nottage 2002, p. 7). The Southern Common Markets (Mercosur) have had on their agenda the harmonisation of competition policy since their foundation in 1991, and in 1996 the member countries signed a protocol which required all member states will have to create an effective competition regime in the near future (Tavares de Araujo Jr. & Tineo 1997, pp. 1-2). Furthermore, the economies of the Asia-Pacific Economic Cooperation (APEC) started regional cooperation on competition law and policy in 1994 (Yasuda 2003, p. 5), and competition law is also beginning to be addressed more extensively within the Common Market for Eastern and Southern Africa (COMESA) (Nottage 2002, p. 10).

Last but not least it is likely that the time span a competition law exists have an influence on its effective enforcement. It can be assumed that efficient competition law enforcement increases over time (institutional learning curve). In particular, after competition law enactment a competition culture has to be build up, experiences with the new law must be gained, competition authority staff must be qualified and hired, courts and judges must become familiar with competition law, etc. In this regard, an analysis of the competition policies of eighteen transition countries by Dutz and Vagliasindi (2000, pp. 4-5) indicates that, within this sample, the first adopters of competition law, Poland, Hungary, Lithuania, Romania, and Estonia have the most effective competition policy.

The discussion is not necessarily exhaustive due to the fact that there exists no model, which explains and predicts the enforcement mechanism of competition law. For example it can be assumed that the extent of resources, budget, staff, influence whether competition law is effectively enforced or not. However, relevant data is barely available for a larger set of countries, and almost not available for longer time series. To our knowledge we have discussed all relevant issues that can be examined with available empirical data above.

3 Testing the relationship between macroeconomic factors and effective enforcement of competition law

Data

With regard to the analysis the main problem remains is the decision of which available data can appropriately measure the efficiency of competition law and can therefore be used as a dependent variable.

In the literature several measures are suggested (see e.g. Nicholson 2004, p. 5). Such measures are for example input measures like budget, number of staff, and qualification of staff of the competition authority or output measures like number of investigated cases. However, reliable data is not really available for a larger set of countries and not available at all for longer time series.⁴ Hence, such data is usually used in case studies or studies with a low number of countries included. Another possibility is to analyse the laws of the different countries in terms of content and comprehensiveness. However, such an approach hardly indicates whether a competition law is enforced in practice. It rather indicates whether a country adopted a mature competition law from developed countries. This is for example the case for EU application and member states or countries, which adopted the ‘model law on competition’ provided by UNCTAD (see Nicholson 2004, pp. 12-9, who introduced such an approach). In contrast to these variables a practicable approach to quantify the effectiveness of competition law for the study seems to be to use the World Economic Forum ‘effectiveness of antitrust policy’ indicator. Although this indicator has some disadvantages it also has some definite advantages making it into a useful indicator for the study. The main disadvantage lies in its construction. The indicator is based on a survey of business leaders which were asked to rate, on a scale from 1 (lowest value) to 7 (highest value), whether antimonopoly policy promotes competition.⁵ In so far the data does not provide information about efficient implementation of competition law, but rather of how business leaders perceive competition law. Furthermore, this ranking is, because the way it is generated, a

⁴ One exception is the information on budget and staff in the handbooks of competition enforcement provided by the global competition review. However, these handbooks are only available since 2003.

⁵ At this point it should be noted that the index calculation has changed at some points in the past. In 1995 business leaders were asked to rate on a scale from 1 to 10, and in 1996 they were asked to rate on a scale from 1 to 6. After 1996 business leaders were asked to rate on a scale from 1 to 7. The question posed was in 1995 whether antitrust law prevents unfair competition or not. In 1997 the question was extended in so far that now it was asked whether antitrust or antimonopoly policy effectively promotes competition. This changed again in 2000. Since then the question is whether anti-monopoly policy promotes competition. In particular, both changes make it somewhat difficult to compare data over time. However, to include as much observations as possible in our analysis we only recalculated the values from 1995 and 1996 to a scale from 1 to 7. Several robustness tests, e.g. excluding the values of 1995 and 1996 have not substantially changed the results.

relatively simple rating. However, despite these deficiencies, it is probably the most comprehensive indicator available in terms of countries included and time periods covered. It is regarded, amongst scientists, as a useful measure for cross-country comparison (see Nicholson 2004, pp. 4-12). Hence, despite the deficiencies mentioned this indicator could be regarded as useful to examine the hypotheses with respect to competition law implementation.

Table 1 provides some information on the development of the ‘effectiveness of antitrust policy’ indicator of the World Economic Forum. It should be noted here that the number of countries included in the indicator exceeds the number of countries with a competition law. This potentially reflects that antitrust or competition policy includes more measures than competition law. However, competition law is regarded in the literature as one of the most important instruments of competition policy (e.g. Evenett 2003, pp. 13-4), so that this indicator might be a good proxy for effectiveness of competition law. To include only countries that have competition law in the regression analysis countries are excluded which have no competition law.

Table 1:
The effectiveness antitrust policy indicator of the World Economic Forum

	Effectiveness of antitrust policy*										
	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
No. of countries	48	49	53	53	59	59	75	80	102	104	117
Mean	3.78	4.46	4.06	4.44	4.33	4.44	4.24	4.03	3.96	4.01	3.97
Standard deviation	0.80	0.70	0.79	0.85	0.91	0.90	1.05	1.04	1.02	0.96	1.03

* WEF indicator on effectiveness of antitrust policy: ranked between 1 and 7; 1 indicates that anti-monopoly policy in the country is lax and not effective at promoting competition, 7 indicates that it effectively promotes competition; values for 1995 are originally on a scale from 1 to 10 and are recalculated to a scale from 1 to 7; values for 1996 are originally on a scale from 1 to 6 and are recalculated to a scale from 1 to 7.

Source: World Economic Forum (1995-2005), own calculations.

With regard to the independent variables to examine what macroeconomic factors tell us about efficient enforcement of competition law we use the following data.⁶

To approximate a country’s level of economic development gross domestic product per capita in purchasing power parity in international dollars divided by 1,000 is used. The size of an economy is approximated by a country’s overall ‘gross domestic product in current US dollars’ divided by 1,000,000,000. To proxy systemic reforms and transition, the overall index of economic freedom provided by the Fraser Institute (Gwartney and Lawson, 2005) is taken. This index includes a variety of data to rate the degree of

⁶ Except where stated, all data are from the World Bank database ‘WDI online’.

economic freedom in a country. It is ranked from zero to ten, where ten is the highest degree of economic freedom and zero the lowest. The index is available at 5-year-frequency, except for 2001, 2002 and 2003 for which annual data are reported. To match the annual frequency of the other macroeconomic variables, the Fraser series are interpolated for the missing values, assuming linear trends. The importance of foreign direct investment for a country is indicated by net inflows of foreign direct investment in percent of the gross capital formation of that country. As indicator for the sectoral structure, particularly reflecting the importance of the industrial sector or level of industrialization, the industry share as a percentage of gross domestic product of the respective country is used. Government final consumption expenditure as a percentage of gross domestic product is taken to measure the overall influence of the state on economic activity within a country. A country's openness to trade is approximated by the ratio of 'imports of goods and services' to gross domestic product, where imports include the values of all goods and other market services that the country receives from the rest of the world. As a measure of the existing level of corruption within a country, the corruption perception index (CPI) provided by Transparency International and the University of Passau is used (Internet Center for Corruption Research 2006). The variable provides information about the perceived degree of corruption within a country. The index is on a scale from 0 to 10, where 0 is the highest degree of perceived corruption and 10 the lowest. The influence of international agencies is approximated by the stock of credit per capita in current US dollars that a country received from the International Monetary Fund. To track the influence of regional trade agreements, the analysis uses dummy variables, which indicate whether a country belongs to one of the regional trade agreements that influence the enactment of a competition law. The variable is binary and takes value 1 if the country is a member of the EU, NAFTA, APEC, Mercosur, or COMESA; otherwise it is set equal to 0. To complement this data, a variable is constructed which indicates for how long a competition law exists in the respective year.

Method

To examine empirically which factors influence effective implementation of competition law fixed effects panel estimation method is employed (for a detailed discussion see e.g. Greene 2003 and Baltagi 2005).⁷ Model specification is as follows:

⁷ Alternatively we thought of to employ a duration analysis to examine which factors slow down or speed up the process of effective implementation. However, with respect to data no variable exist which indicate when a competition law is effective enforced. It might be possible to assume a threshold which indicate effective enforcement on the basis of the World Economic Forum 'effectiveness of antitrust policy' indicator. However, such an approach cannot be supported by reasonable assumptions which value the threshold should have. Furthermore, such an approach would reduce the number of observations substantially.

$$Y_{it} = \alpha_i + x_{it}'\beta + u_{it} \quad (1)$$

where Y_{it} is the value of the effectiveness of antitrust policy indicator of the respective country i at time t , α_i is a country specific fixed parameter, x_{it} is the vector of explanatory variables, and u_{it} is the error term.

The use of panel data allows us to observe time series as well as the cross section of countries. The former informs us about changes in relationships over time, whereas the latter allows including several countries, so as to get more generalisable results. Panel analysis also allows us to control for unobserved country-specific effects.

A standard issue in panel data econometrics is whether to treat country-specific effects as fixed or as random. This is particularly relevant for this estimation, because T (# of years) is relatively small and N (# of countries) is comparably large. Therefore, it is important to make the most efficient use of the data. In a case like ours which does not draw on a random sample from an underlying population, rather we include all countries that have a competition law after a certain time of point, a fixed effects model seems to be appropriate. Furthermore, the Hausman test suggests that x_{it} and α_i are correlated indicating that the random effects approach would lead to inconsistent estimators as it ignores this correlation. Hence, a fixed effects model is estimated.

We are especially interested in what factors influence the effective application of relatively new competition laws. For this reason, we start our estimation procedure by including all countries enacting competition law in 1990 and later. Thereafter we rerun the estimation procedure for all countries, which enacted competition laws after 1980 and 1970 in order to examine whether there are substantial differences between the samples drawn from the different time periods. In particular, we expect that the time variable becomes more important with an increase in the time the competition law exists. The inclusion of all variables found to contribute to enactment of competition law produced a number of insignificant variables. As a result, we reduced the number of variables through stepwise regression, excluding the most insignificant variable first, to obtain a model only including relevant variables.⁸

The overall sample used to examine the hypotheses comprises data from 1995 to 2005 from 71 countries, which enacted competition law in 1990 and later. The sample increases to a total number of countries of 78 and 84 for the estimation, where countries are considered that enacted competition law after 1980 and 1970 (see Annex 1).

⁸ For all three estimation models a F-test of joint significance for the excluded variables was performed. The resulting F-statistics were not significant indicating that the excluded variables are jointly not important

Discussion of empirical results

Table 2 presents the estimation results. For two reasons, countries contribute not equally to the estimation results. First, data availability varies from country to country. Second, countries are only included in the regression analysis only after enactment of competition law. Hence, an unbalanced panel is used for the regression analysis. Furthermore, as not for all countries of our sample data are available for all variables not all countries contribute to the estimation results. This might bias the results, as it can be assumed that especially for less developed countries and less democratic states data restrictions weigh more heavily. Although this circumstance cannot be changed, it is important to bear this in mind.⁹ Furthermore, it is important to repeat that the dependent variable does not measure real effectiveness of competition laws, but rather the perceived effectiveness of competition laws in promoting competition.

The results suggests that for all models the null hypothesis of joint insignificance, that is the models do not contribute to the explanation of the effectiveness of competition law, can be rejected. Furthermore, the results suggest that not all variables which might influence whether a country enacts a competition law (see Palim 1998 and Kronthaler & Stephan 2007) actually contribute to the explanation of the perceived effective implementation of competition law. The factors contributing to whether a competition law is effectively enforced are the level of economic development, the size of the economy, openness to trade, corruption, and the time a competition law exists.

In particular, the empirical examination shows a significant and positive relationship between the level of economic development and effectiveness of competition law. Hence, higher developed countries with a relatively newly adopted competition law enforce their law more efficiently. This is although CUTS stated that in the developing world the need for an effective competition regime is more and more recognised (CUTS 2003a, p. 17). The results, however, indicate that the level of economic development matters. This might simply reflect that higher developed countries dispose of more resources, professional expertise, a better-developed academic infrastructure, and a better-developed juridical system. Furthermore, it may be the case that higher developed countries rely less on interventionist development strategies and have fewer problems with competing priorities.

⁹ Countries that do not contribute to the estimation results include Albania, Antigua and Barbuda, Armenia, Azerbaijan, Barbados, Belarus, Benin, Bosnia and Herzegovina, Burkina Faso, Cambodia, Cote d' Ivoire, Cyprus, Faeroe Islands, Fiji, Gabon, Georgia, Kazakhstan, Kyrgyzstan, Luxembourg, Macedonia, Malta, Moldova, Mongolia, Namibia, Oman, Papua New Guinea, Serbia and Montenegro, Singapore, Taiwan Province of China, Tajikistan, and Uzbekistan.

Table 2:
Estimation results for effective enforcement of competition law

Variable	Dependent variable: Effectiveness of competition law					
	Countries enacted in 1990 and later		Countries enacted in 1980 and later		Countries enacted in 1970 and later	
	1	2	3	4	5	6
GDP <i>p.c.</i>	0.115**	0.134***	0.092**	0.117***	0.026	
GDP	- 0.001**	- 0.001**	- 0.001**	- 0.001**	- 0.001*	- 0.001*
Economic freedom index	- 0.117		- 0.060		- 0.013	
Foreign direct investment	- 0.003		- 0.004		- 0.001	
Industry share	- 0.023		- 0.027		- 0.024	
Government consumption expenditure	0.002		0.010		- 0.004	
Imports of goods and services	0.011		0.012		0.016*	0.017**
Corruption perception index	0.245***	0.208***	0.209***	0.176***	0.143**	0.137**
International monetary fund credit	- 0.001		- 0.001		- 0.001	
Regional trade agreements	0.143		0.159		0.037	
Time the law exists	0.042	0.048**	0.035	0.044**	0.070***	0.086***
Constant	2.635**	1.593***	2.592**	1.799***	2.796**	1.900***
No. of countries	42	42	47	47	52	52
No. of observations	195	195	225	225	259	259
Rho	0.826	0.834	0.786	0.789	0.739	0.749
F-Test	6.04***	15.58***	7.41***	18.31***	7.70***	19.88***

* significant at the 10%-level; ** significant at the 5%-level; *** significant at the 1%-level.

Source: Authors' calculations.

With regard to the size of the economy the results indicate that smaller countries recently having enacted competition law enforce their competition law more effectively than larger economies. At first sight, this is counterintuitive as it is often argued that small countries need not a competition law because import competition promotes competition far better than competition law. Furthermore, it is often claimed that benefits from economies of scale can exceed the benefits of competition law. In fact, Palim (1998) and Kronthaler and Stephan (2007) suggests that larger economies have a higher probability that a competition law is enacted. However, smaller countries share

different features compared to larger countries and these might explain that competition law is more effectively implemented once it is enacted. One possible explanation is that once a competition law is enacted within smaller countries it is recognized that they face circumstances, like higher entry barriers and higher market power by enterprises, which can be addressed by competition law. One other possible explanation lies in the fact that, in particular in the first years after adoption a lot of competition advocacy work has to be done to build up a competition culture and to make population and enterprises familiar with and aware of the law. The point here is that this work might be managed faster and more effectively in smaller countries where less people and enterprises exist, so that the new law is more rapidly perceived as effective. A third explanation could be that in smaller economies with a lower number of firms and higher concentration levels compared to larger economies implementation of competition law is perceived more effectively due to firms being more concerned with the law. The latter explanation seems to be less likely, as the question asked to construct the index is whether competition law effectively promotes competition or not, however, it cannot be completely discarded.

The third variable having a significant positive relationship to effective competition law implementation, is the import variable. However, a significant relationship exists only in the model, which includes all countries that enacted competition law after 1970. This restriction indicates that countries notice the need for an effective competition law as a complement to increased openness and also the potential of competition law to be used against abuses of market power by multinational enterprises and cartels only in the longer-run.

The next significant variable is the corruption index. The lower the perceived corruption the more effective is competition law implementation. The value of the corruption index decreases with increasing corruption. Interestingly Kronthaler and Stephan (2007) find the opposite: countries with high corruption have a higher probability of enacting competition law. Connecting both results provides an interesting result. Whilst on the one hand enactment of competition law seems to be fostered by interest groups, enforcement seems to be hampered by interest groups. One possible explanation is that interest groups, politicians, and enterprises are able to capture competition law for their own interests so that competition law is not perceived effective in promoting competition. Furthermore, the result indicates that countries are not able or successful to use competition law as a remedy against corruption, as sometimes suggested in the literature (see e.g. Kovacic 2001, pp. 296-7).

The last variable found to influence effective competition law implementation is the time period for which a competition law has been in force. Here, a significant positive relationship between time and effectiveness of competition law exists. This indicates that time matters. Interestingly, the level of economic development becomes less important with the inclusion of countries that have a longer experience in applying competition

law. This indicates that in the longer-run time and the institutional learning curve is more important than the level of economic development.

All other variables are not found to contribute significantly to the perception of the effectiveness of competition law. However, with regard to the studies which we used as one guidance for our explorative analysis (Palim 1998 and Kronthaler and Stephan 2007), it is worth to make a few further remarks, in particular to the findings with respect to economic freedom, membership in regional trade agreements, and influence of the IMF.

As already mentioned no significant relationship between perceived effective enforcement of competition law and economic reforms is found. Palim (1998) and Kronthaler and Stephan (2007), however, find a positive relationship between stronger reliance on market forces and the probability of enacting a competition law. A possible explanation might be that countries, which are undergoing economic reforms need a vast amount of resources to implement these reforms, and although they enact and might want to implement an effective competition law, they have not sufficient resources to implement competition law significant better than countries, which do not face the task of economic reforms.

A further interesting result is the finding with regard to membership in regional trade agreements. Whilst the results in regard to enactment by Palim (1998) and Kronthaler and Stephan (2007) show that membership in regional trade agreements significantly influences the probability of enactment, no relationship is found with respect to effective enforcement. This, however, means that countries, which belong to a regional trade agreement, do not enforce their recently enacted competition law significantly better than countries, which do not belong to a regional trade agreement. This is astonishing, as for example, the EU pays great attention to whether a competition law is effectively enforced in its new member states and provides a lot of assistance so that competition law can be effectively enforced, e.g. through the European Competition Network (ECN).¹⁰ A possible explanation is that in a fixed effects model only those countries, which change their status from not-belonging to belonging to a regional trade agreement contribute to the identification of the parameter. In our sample this is the case only for seven countries, which might be not enough to generate a significant relationship. However, this result holds by using other estimation techniques such as pooled regression, a random effects model, and a between effects model. Hence, it can be assumed that membership in regional trade agreements does not significantly influence whether a competition law is perceived to be effective or not.

¹⁰ The variable member includes not only the EU but also the trade agreements Mercosor, NAFTA, APEC and COMESA. The result, however, does not change when the models are recalculated only with a dummy for EU membership.

With regard to the influence of the IMF again no significant relationship is found with regard to effective enforcement, whilst the results by Kronthaler and Stephan (2007) indicate that countries enact competition law at the insistence of the IMF. Hence, IMF conditionality does contribute to whether a country enacts competition law but does not contribute to whether a country enforces its competition law. A possible explanation lies in the IMF disbursement procedure. The conditionality of IMF credit is initiated by a letter of intent in which the recipient countries spell out plans for reform (sometimes including the implementation of competition law). The first tranche is usually disbursed on this promise, while further tranches are disbursed after observing progress in the fulfilment of the conditions. Competition law negotiations and implementation is a long lasting process, where potential enactment of competition law is considered as substantial progress. Hence, due to the length until a competition law is drafted and enacted it is assumable that IMF control rather enactment than implementation. However, also important in terms of effective enforcement is that it seems to be of no relevance whether competition law is introduced by the insistence of international organisations or donors.

4 Conclusion

With regard to the question what macroeconomic factors can tell about effective enforcement of recently enacted competition laws the study provides several interesting results.

Firstly, it seems to be the case that the level of economic development is important for effective enforcement in the short-run, whilst in the longer-run the time a competition law exists seems to be more relevant to explain effective competition law implementation. This indicates that even less-developed countries have a chance to implement an efficient competition law. Secondly, perceived effectiveness of competition law decreases with the size of an economy. This indicates that larger countries should be rather more concerned about competition advocacy activities to build up a competition culture than smaller countries. Thirdly, at least in the longer-run increasing openness to trade seems to increase the need to implement an effective competition law, maybe to address anticompetitive behaviour by foreign firms or multinational enterprises or cartels. Fourthly, with regard to corruption, the results indicate that countries with high corruption should be concerned about the fact that interest groups can hamper effective implementation of competition law or, even worse, can capture competition law for their own purposes. Hence, in particular in countries in which corruption is high serious efforts have to be taken that a competition law really fulfilled its objective, to protect competition not competitors and interest groups. A further interesting result is that countries that might introduce competition law at the insistence of IMF do not perform worse or better in effective competition law implementation than countries that enacted competition law for other reasons. At last, the empirical result that membership in regional trade agreements does not contribute to perceived effective enforcement is rather astonishing and cannot be explained by this study.

In general, macroeconomic factors cannot tell the whole story of what contributes to whether countries effectively implement competition law or not. For further insights it is hence important to go more into detail with help of case studies not at least to explain the presented results in greater detail.

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Annex 1:
Countries with a competition law

Country ^a	Competition law ^b	Development status by enactment ^{c,d}	Development status in 2005	World region ^e
Canada	1889	H	H	North and Central America
United States	1890	H	H	North and Central America
United Kingdom	1948	H	H	Europe
Austria	1951	H	H	Europe
France	1953	H	H	Europe
Japan	1953	H	H	Middle East and Asia
Norway	1953	H	H	Europe
Sweden	1953	H	H	Europe
Denmark	1955	H	H	Europe
Finland	1958	H	H	Europe
Germany	1958	H	H	Europe
Netherlands	1958	H	H	Europe
New Zealand	1958	H	H	Oceania
Israel	1959	H	H	Middle East and Asia
Belgium	1960	H	H	Europe
Switzerland	1964	H	H	Europe
Australia	1965	H	H	Oceania
India	1969	L	L	Middle East and India
Luxembourg	1970	H	H	Europe
Pakistan	1970	L	L	Middle East and Asia
Chile	1973	LM	UM	South America
Greece	1977	UM	H	Europe
Ireland	1978	H	H	Europe
South Africa	1979	LM	UM	Africa
Argentina	1980	UM	UM	South America
Korea, Rep.	1980	UM	H	Middle East and Asia
Sri Lanka	1987	L	LM	Middle East and Asia
Kenya	1988	L	L	Africa
Cyprus	1989	H	H	Europe
Gabon	1989	UM	UM	Africa
Spain	1989	H	H	Europe
Benin	1990	L	L	Africa
Hungary	1990	UM	UM	Europe
Italy	1990	H	H	Europe
Poland	1990	LM	UM	Europe
Bulgaria	1991	LM	LM	Europe
Cote d'Ivoire	1991	LM	L	Africa
Czech Republic	1991	LM	UM	Europe
Kazakhstan	1991	LM	LM	Middle East and Asia
Latvia	1991	UM	UM	Europe
Peru	1991	LM	LM	South America
Russian Federation	1991	UM	UM	Europe
Taiwan Province of China	1991	H	H	Middle East and Asia
Tunisia	1991	LM	LM	Africa
Belarus	1992	UM	LM	Europe
Colombia	1992	LM	LM	South America
Fiji	1992	LM	LM	Oceania
Liechtenstein	1992	H	H	Europe
Lithuania	1992	LM	UM	Europe
Mali	1992	L	L	Africa
Mexico	1992	UM	UM	North and Central America
Moldova	1992	LM	L	Europe
Tajikistan	1992	L	L	Middle East and Asia
Ukraine	1992	LM	LM	Europe

Country ^a	Competition law ^b	Development status by enactment ^{c,d}	Development status in 2005	World region ^e
Uzbekistan	1992	LM	L	Middle East and Asia
Venezuela	1992	UM	UM	South America
Azerbaijan	1993	LM	LM	Middle East and Asia
China	1993	L	LM	Middle East and Asia
Estonia	1993	UM	UM	Europe
Iceland	1993	H	H	Europe
Jamaica	1993	LM	LM	North and Central America
Portugal	1993	UM	H	Europe
Slovenia	1993	UM	H	Europe
Brazil	1994	UM	LM	South America
Burkina Faso	1994	L	L	Africa
Costa Rica	1994	LM	UM	North and Central America
Kyrgyzstan	1994	L	L	Middle East and Asia
Malta	1994	UM	H	Europe
Mongolia	1994	L	L	Middle East and Asia
Senegal	1994	L	L	Africa
Slovakia	1994	LM	UM	Europe
Tanzania	1994	L	L	Africa
Turkey	1994	LM	UM	Europe
Zambia	1994	L	L	Africa
Albania	1995	L	LM	Europe
Algeria	1995	LM	LM	Africa
Croatia	1995	UM	UM	Europe
Georgia	1996	LM	LM	Europe
Panama	1996	LM	UM	North and Central America
Romania	1996	LM	LM	Europe
Serbia and Montenegro	1996	LM	LM	Europe
Trinidad and Tobago	1996	UM	UM	North and Central America
Zimbabwe	1996	L	L	Africa
Faeroe Islands	1997	H	H	Europe
Cameroon	1998	L	L	Africa
Malawi	1998	L	L	Africa
Indonesia	1999	L	LM	Middle East and Asia
Macedonia, FYR	1999	LM	LM	Europe
Thailand	1999	LM	LM	Middle East and Asia
Armenia	2000	L	LM	Europe
Jordan	2000	LM	LM	Middle East and Asia
Morocco	2000	LM	LM	Africa
Oman	2000	UM	UM	Middle East and Asia
Uruguay	2000	UM	UM	South America
Antigua and Barbuda	2001	UM	UM	North and Central America
Bosnia and Herzegovina	2001	LM	LM	Europe
Cambodia	2002	L	L	Middle East and Asia
Papua New Guinea	2002	L	L	Oceania
Barbados	2003	UM	UM	North and Central America
Mauritius	2003	UM	UM	Africa
Namibia	2003	LM	LM	Africa
Singapore	2005	H	H	Middle East and Asia

^a A country is taken to have a competition law if a law exists that addresses one or all kinds of anti-competitive behaviour which is normally part of a competition law, such as monopolies, cartels, horizontal and vertical cooperation, mergers, and predatory pricing. – ^b The year indicates when a country enacted its first competition law. – ^c Development status classification: H stands for high income countries, UM for upper middle income countries, LM for lower middle income countries, L for low income countries. – ^d The World Bank analytical classification dates back until 1987. Countries that have enacted before 1987 are denoted with the development status by 1987. – ^e Regional classification is that of the International Bar Association.

Source: Internet and literature search; World Bank income classification.

Annex 2:
Competition policy enforcement in transition countries

Country	Competition law ^a	Competition policy implementation ^b					
		2000	2001	2002	2003	2004	2005
Hungary	1990	3	3	3	3	3	3
Poland	1990	3	3	3	3	3	3
Bulgaria	1991	2+	2+	2+	2+	2+	3-
Czech Republic	1991	3	3	3	3	3	3
Kazakhstan	1991	2	2	2	2	2	2
Latvia	1991	2+	2+	2+	3-	3-	3-
Russia	1991	2+	2+	2+	2+	2+	2+
Belarus	1992	2	2	2	2	2	2
Lithuania	1992	3-	3	3	3	3	3
Moldova	1992	2	2	2	2	2	2
Slovenia	1992	3-	3-	3-	3-	3-	3-
Tajikistan	1992	2-	2-	2-	2-	2-	2-
Ukraine	1992	2+	2+	2+	2+	2+	2+
Uzbekistan	1992	2	2	2	2-	2-	2-
Azerbaijan	1993	2	2	2	2	2	2
Estonia	1993	3-	3-	3-	3-	3-	3-
Kyrgyz Republic	1994	2	2	2	2	2	2
Slovak Republic	1994	3	3	3	3	3	3
Albania	1995	2-	2-	2-	2-	2	2
Croatia	1995	2+	2+	2+	2+	2+	2+
Georgia	1996	2	2	2	2	2	2
Romania	1996	2+	2+	2+	2+	2+	2+
Serbia and Mont.	1996	-	1	1	1	1	1
FYR Macedonia	1999	2	2	2	2	2	2
Armenia	2000	1	2	2	2	2	2+
Bosnia and Herzegovina	2001	1	1	1	1	1	1
Turkmenistan	-	1	1	1	1	1	1

^aThe year indicates when a country enacted its first competition law. – ^bEBRD competition policy indicator: ranked between 1 and 4+, whereas 1 indicates that in the specific country exists no competition legislation and institution; 4+ indicates that the standards are equal to those of typical advanced economies.

Source: Internet and literature search; European Bank for Reconstruction and Development (2000-2005).

