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Beyond the Informal/Formal Divide: How do Firms Combine Contract-enforcement Institutions?

BEYOND THE INFORMAL/FORMAL DIVIDE: HOW DO FIRMS COMBINE CONTRACT-ENFORCEMENT INSTITUTIONS?[1]

HÉTFA Research Institute and Center for Economic and Social Analysis

HÉTFA Working Papers No. 2017/21

Budapest

Publisher: Károly Mike[2] and Gábor Kiss[3]

Series Editor: **Balázs Szepesi**

Proofreader: **Andrea Vinkler**

ABSTRACT

This paper explores how a broad range of contract-enforcement institutions are combined in interfirm relationships under a developed legal system. We analyse managerial survey data to identify ideal-types of governance strategies that rely on distinct combinations of institutions. We find three ideal-types: (1) bilateral governance, using morality and self-enforcement; (2) third-party governance, leaning on a mix of courts, reputation and community norms; and (3) comprehensive governance, relying heavily on all institutions. Thus, the crucial governance choice is not between formal/informal but bilateral and third-party (both formal and informal) institutions. The two sets can be substitutes but are more often complements. Governance choice is primarily related to transaction characteristics rather than the firm's environment.

1. INTRODUCTION

Economists have come to agree that a broad range of institutions are needed to support the enforcement of contracts in any advanced economy (Williamson 1985; North 1990; Greif 2008; Brousseau 2008). Informal institutions, such as morality, self-enforcing contracts, personal and corporate reputation and social norms, as well as the formal institutions of the legal order all play important roles. Although there is now an extensive literature about each of these institutions, we still know very little about how they are combined. Are they used togetheror as substitutes? Are there typical 'bundles" of institutions that are used jointly? If there are, what factors influence choices among such combinations? The answers are highly pertinent for both firms and policy-makers.

Transaction-cost economics argues that firms must combine formal and informal institutions in appropriate ways to secure contractual performance in their business relationships. In the classical view, formalised legally enforceable market contracts and largely informal relational contracts represent the two extremes, while other business relationships can be interpreted as being somewhere in between (Williamson 1979; 1996). In other words, formal and informal institutions are basically substitutes in the governance strategies of firms. Recent empirical scholarship in strategic management has confirmed that contract-enforcement institutions must be combined in consistent ways but called into question the substitution view. Instead, complementarity between formal and informal mechanisms is often found (Zenger, Lazzarini & Poppo 2002; Poppo & Zenger 2002). At this point, no clear patterns of institutional combinations emerge (Schepker et al. 2014).

Another strand in the economics literature stresses that the institutional choice of firms depends on their environment rather than transaction features. There may be segments in the economy characterised by the dominance of informal institutions, such as localised economies (Ellickson 1991; Dixit 2003), certain industries

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1   The European Union set specific targets for its countries in 2002 and renewed them in the Europe 2020 Strategy, prescribing a 33% coverage rate for children under 3, and a 90% coverage rate for those between 3 and the mandatory school age by 2010 (EC, 2013, 2008). While most previous estimates pertain to western countries with relatively supportive environments and already high maternal labor supply rates, little evidence is available from settings with very different institutional contexts, such as the Southern and Central-Eastern European (CEE) countries. Since most of these countries are significantly behind in fulfilling their obligations and expansion places a high financial burden on them, it is important to assess the expected labor market impact accurately given their particular context.

2   The current version of the paper is based on 9 countries, but we are currently working on adding at least 3 further countries as the data becomes available. Latvia, Lithuania and Poland are potential candidates.

(Bernstein 2001) or ethnic groups (Landa 1981; Bernstein 1992). Yet informality seems to be present in a broad range of business relationships in many industries (Macaulay 1963; Brousseau 2008). Again, we have no clear picture of typical patterns on how institutions are combined across a market economy.

On a policy level, building a mix of institutions that suits the actual contract-enforcement needs of economic actors is crucial for economic growth (Trebilcock & Leng 2006). According to what we might call the classical view of development, institutional evolution is characterised by a shift from informal to formal forms of exchange (Weber 1927; North 1990; Kimbrough et al. 2008). So the main task is to build and maintain a rule of formal law (Clague et al. 1999; Djankov et al. 2003). However, the continuing presence of informality in even the most develop economies calls for a more open policy approach which acknowledges and perhaps supports various combined uses of contract-enforcement institutions. Such a policy must rely on knowledge about typical combinations and the factors that influence them.

Most research has been limited so far to interactions between two (or at most three) institutions and focused on marginal effects e.g. between formal contracts and relational norms. A few groundbreaking studies examined a broader set of contract-enforcement mechanisms used by firms (Hendley et al. 2000; Hendley & Murrell 2002; Murrell 2003) but only analysed linear relationships among them. Another limitation was that they relied on data from the rather special transitional period of post-communist countries.

In our study, we examine a comprehensive set of contract-enforcement institutions and identify the typical combinations in which they are used in interfirm relationships throughout an economy. We go beyond assuming (positive or negative) linear relationships between them and allow for more complex interactions. The technique of latent class analysis, which is a model-based clustering method (Vermont & Magidson 2002), enables us to accomplish this. We follow legal theory (Macneil 1978; Goldberg 1980) and transaction cost economics (Williamson 1979) in assuming that enforcement mechanisms must be combined into coherent governance strategies. By latent class analysis, we identify distinct classes of governance strategies in interfirm relationships and the patterns of reliance on different contract-enforcement institutions that characterise these strategies. By doing so, we shed new light on substitutions and complementarities among informal and formal institutions. Our analysis uses data from a national survey among managers that covers 600 business transactions of small and medium firms in a European, OECD-member country with a developed legal system (Hungary).

As our main result, latent class analysis detects three distinct governance strategies: (1) *bilateral* governance, relying mostly on morality and self-enforcement; (2) *third-party* governance, using a mix of courts, personal and corporate reputation and community norms; and (3) *comprehensive* governance, relying heavily on all institutions. This suggests that the real choice at the level of governance is not between informal and formal institutions but between bilateral and third-party solutions on the one hand, and partial

or comprehensive use of institutions, on the other. The number of relationships that use comprehensive governance is highest among the three groups, which means that institutions most often – though far from always – serve as complements rather than substitutes.

Latent class regression analysis reveals which factors influence the choice among the three classes of governance. Transaction features show significant correlations with governance choice while characteristics of the firms and their operating environment matters much less. Thus, governance choice corresponds primarily to transaction characteristics.

Section 2 situates our study in the context of existing empirical research. The survey sample is introduced in Section 3: the economic environment of Hungary, the firms and their transactions in the sample are described. Section 4 provides an overview of the relative importance of various contract-enforcement institutions as perceived by managers in their business relationships. Section 5 presents the results of statistical analysis in three steps. First, we calculate simple correlations between contract-enforcement institutions, which allows for comparison with previous studies. Second, we carry out a latent class analysis to identify classes of governance strategies. Third, we include regressions in the latent class analysis in order to identify the factors that influence the choice of governance strategy. Section 6 concludes.

2. CONTRACT-ENFORCEMENT INSTITUTIONS AND THEIR RELATIONSHIPS: WHAT DO WE KNOW?

2.1. A TAXONOMY OF CONTRACT-ENFORCEMENT INSTITUTIONS

Ellickson (1991) provides a useful taxonomy distinguishing institutions based on who applies the sanction for breaking rules, which can be applied to contract enforcement. (i) *Morality* provides *'first-party'* enforcement: a party in contractual breach sanctions himself by developing a bad conscience. Apart from physical threats, threatening to discontinue cooperation is the most important form of sanction applied by the contracting party who suffers from breach of contract. Such *'second-party'* enforcement is the basis for a (ii) *self-enforcing contract*. Morality and self-enforcement can function without help from the social environment. Parties get to know each other and reveal their moral qualities. They invest in increasing the value of cooperation, which they will not wish to lose later. By these two mechanisms, productive relationships can be built and sustained.

In any well-functioning economy, these two basic institutional mechanisms are, to some extent, complemented or replaced by *informal* mechanisms that rely on *third-party enforcement*: (iii) *community norms* and sanctioning based on the potential loss of (iv) *personal reputation*. Finally, an advanced economy must have institutions that support exchanges between strangers. (v) *Formal legal sanctions applied by courts* and (vi) the *impersonal market reputation* of firms (Greif 2006) are two such fundamental third-party institutions.

Although the list could be extended, we focus on these as the most fundamental contract-enforcement institutions in any advanced economy (cf. Hendley & Murrell 2002; Fafchamps 2004; Greif 2008; Brousseau 2008,). Besides courts and the general order of private law, government agencies could also be considered as enforcers of contracts (e.g. Hendley et al. 2000). However, they tend to be sector-specific and our focus here is on general patterns in an economy. Private-order organisations such as business clubs, professional associations or chambers, may also provide rules and sanctions for contract-enforcement (e.g. Greif 2008).

We will consider them as parts of the firms' institutional environment that affect business relationships through one or more of the six basic institutional mechanisms above.

2.2. INTERACTIONS BETWEEN INSTITUTIONS

As we noted, most empirical research is limited to interactions between two or three institutions. Among these, by far the greatest attention has been devoted to the relationship between legal enforcement and the use of morality and self-enforcing contracts that constitute 'relational governance' (Poppo & Zenger 2002). One argument, corroborated by some evidence in experimental settings (Gächter & Falk 2000) is that external sanctions may 'crowd out' internal motivations to cooperate. Another line of reasoning is that contract-specific investments tend to make the termination of a contract very costly and the threat to go to court non-credible. In such cases, relational or self-enforcing contracts (Telser 1981; Macneil 1978) and bilateral governance (Williamson 1979) may be preferred. By contrast, some economic models (Baker et al. 2002; Crocker & Masten 1991) and recent management scholarship (Poppo & Zenger 2002; Lazzarini et al. 2004) suggest that the threat of judicial enforcement is in fact important for securing complex, uncertain, long-term transactions, formerly considered the domain of relational governance. Rather than undermining trust, it may support its creation or even perpetuation by providing clear 'threat points' and 'last resort' sanctions. Overall, most empirical studies to date support the thesis of complementarity between legal enforcement and relational governance but the question is far from settled (Cao & Lumineau 2015).

We know even less about links between the uses of other contract-enforcement institutions, which few works discuss. Courts can support the mechanisms of reputation by providing reliable information about business conduct (Milgrom et al. 1990). *Vice versa*, effective reputational mechanisms may make up for the inefficiencies of a legal system and make reliance on the latter more likely (Woodruff 2004). In other cases, the availability of legal sanctions can make reliance on reputation less necessary (Johnson et al. 2002). Community norms may be enhanced (Cooter 1994) or replaced (Johnson et al. 2002) by legal enforceability.

A recurring feature of the literature is the assumption that the key choice variable in a firm's governance strategy is the formality of the contract-enforcement institutions: whether to use the formal institutions of the legal order or (various) informal institutions, or both. The debate mainly revolves around the question whether (i) informal and formal contract-enforcing institutions are substitutes: governance is either predominantly informal or formal; or (ii) they are complements: governance either relies little on both sets of institutions or it relies heavily on both.

A similar approach dominates the literature that focuses on the level of institutional environment rather than the level of governance (cf. Williamson 2000). Several case studies show that some segments of the economy are characterized by an especially heavy reliance on informal mechanisms of contract-enforcement (e.g. Bernstein 1992, 2001; Landa 1981; McMillan 2002). This view is reinforced by theoretical literature which argues that communities or industries must choose between formal (legal) and impersonal enforcement or informal enforcement (Greif 1993; Kranton 1996; Dixit 2003). However, others stress that even in sectors where informal institutions dominate, they tend to operate in the shadow of law (Hodgson X). Again, the dividing line is between formal and informal institutions, and the central question is substitution versus complementarity. A key difference is that while governance-level studies tend to associate the use of institutions with transaction features, the studies of the institutional environment stress that the firms' choice of institutions depends mainly on the environment in which they operate.

We are aware of only a few studies that attempt to provide a comprehensive view of the most important contract-enforcement mechanisms in a country's private economy.[1] Hendley et al. (2000) asked managers of Russian manufacturing firms to evaluate the importance of various institutions for enforcing the contractual promises of suppliers and buyers. Correlations between the relative perceived importance of institutions within relationships showed that personal trust (morality) and self-enforcement were closely linked but independent of other institutions. Formal institutions (e.g. courts, governments) and third-party informal mechanisms (e.g. personal ties, business reputation) were used together in different combinations, reflecting the firm's relationship with the former Soviet state sector, corresponding to the still transitional state of Russian economy in the late 1990s. A survey using the same method was conducted in Romania in 2001, the results of which were analysed by Hendley & Murrell (2002) and Murrell (2003). Extracting principal components from the institutional variables revealed three independent aspects of strategic choice among contract-enforcement institutions: (1) bilateralism, i.e. the joint use of personal trust and self-enforcing contracts; (2) reliance on the legal system; and (4) the decision about the aggregate use of contract-supporting institutions in general. Regression analysis suggested that the use of institutions was mainly driven by the closeness of the firm to the former state sector rather than transaction characteristics. These studies suggest that informal institutions should be unbundled into two subsets: (1) morality and self-enforcing contracts, and (2) third-party informal institutions.

The analysis of correlations and principal components has a serious limitation: it assumes that the relationships among the uses of institutions are linear. However, the ambiguity of interactions between any two institutions, discussed above, questions the validity of this assumption. For example, we may have contracts that combine heavy reliance on legal enforceability and self-enforcement, while others use the former but not the latter. Correlations are mainly useful for revealing subsets of institutions that are used

jointly under most circumstances. Indeed, the only clear finding so far is the joint use of morality (or personal trust) and self-enforcing contracts, forming two aspects of bilateral governance. We follow the work of Hendley & Murrell (2002) and Murrell (2003) in identifying the patterns of reliance on a comprehensive set of institutions but move beyond their analysis by applying the more nuanced technique of latent class analysis, which posits no specific functional form for the relationships among institutional variables. We ask the following questions:

1. How do firms typically combine contract-enforcement institutions in their governance strategies in an economy with a developed legal system?

2. How do transaction characteristics influence the combined choice of contract-enforcement institutions?

3. How does firms' operating environment influence the combined choice of contract-enforcement institutions?

2.3. LIMITS TO GENERALISATION

Can the findings in one country at one date be generalised to other economies at other dates? One objection is that there exist obvious differences in the relative importance of some institutions. For example, East-Asian economies rely much less on the legal system and much more on personal ties and the norms sustained by them than European countries at comparable levels of development (Murrell 2001). Another objection is that changes in the broader institutional environment can lead to changes in firms' governance strategies over time, as argued by the studies about post-communist countries discussed above (see also Peng 2003; Zhou & Poppo 2010). However, to the extent forms of contractual governance depend on transaction features rather than the firm's environment (as in Williamson 1979), we should expect similar governance strategies to occur in different countries. Therefore, if we find strong links between transaction characteristics and governance strategies using well-defined combinations of institutions, we have some reason to expect that our results would also be valid at least for broadly similar countries.

3. FIRMS AND THEIR TRANSACTIONS IN THE SAMPLE

A nationwide survey was conducted among 300 privately owned small and medium sized enterprises (with 5-49 employees) in Hungary. In April and May 2011, personal interviews with executive managers were carried out in seven Hungarian cities, including its capital city (Budapest), three mid-sized cities in East Hungary and another three cities in West Hungary.[2] Locations were chosen to cover all major regions of the country, with different levels of economic development. All major sectors, except agriculture [3], were covered, roughly in proportion to their contribution to national income (29% manufacturing, 32% commerce, 39% services). Within cities and sectors, companies were chosen randomly from the database of the official firm registry. Overall, the survey sample can be considered as fairly representative of the country's population of non-agricultural SMEs. As such, it belongs to a very limited number of surveys about contract-enforcement mechanisms with at least some claim to national representation (McMillan & Woodruff 2001; Hendley et al. 2000; Johnson et al. 2002; Murrell 2003; Lu & Tao 2009; Steer & Sen 2010)

Hungary belongs to those former Soviet-occupied countries in East-Central Europe where a functioning institutional order of markets emerged roughly by the turn of the millennium (Campos 1999; Crafts & Kaiser 2004; Beck & Leaven 2006; Murrell 2008;). Like other countries in East Central Europe, Hungary has a highly developed legal system (Murrell 2008), ranked 8th in the world in the category of 'enforcing contracts' by the World Bank's Doing Business Survey in 2016,[4] although trust in the rule of law is lower than in Western Europe (Kaufmann et al. 2009). Hungary is one of the less well-off countries in the European Union, with per capita GDP at 65% of the EU average (in 2014, at pps). However, its three large regions exhibit large differences in terms of economic development: the GDP/capita measure is at 107% in Central Hungary, 60% in West Hungary (Transdanubia) and 44% in East Hungary (North and Great Plain).

Managers were asked questions about their company's experience with two firms: one which they considered a 'typical supplier' and another considered a 'typical buyer'. The questionnaire focussed on the transactional characteristics of their relationships, their reliance on various institutional mechanisms to safeguard their contracts as well as the perceived success of collaboration.

Managers were free to think about any business partner whom they considered as 'typical'. Their answers included a diverse array of firms (Table 1). While the majority were other Hungarian SMEs (59.7%), many relationships with large Hungarian-owned enterprises, multinationals and foreign firms were mentioned. This diversity was also reflected in the geographical distance between the interviewed firm and its business partner (Table 2). Hence, our sample allows us to examine contracts both within and beyond the local environments of SMEs.

Table 1. Types of business partners

	Frequency	Percent
Hungarian SME	358	59.7
Multinational company operating in Hungary	92	15.3
Hungarian-owned large enterprise	88	14.7
Firm operating abroad [export]	44	7.3
N/A	18	3.0
Total	600	100.0

Table 2. Geographical distance.
('What is the location of your business partner's operating unit with which
you do business?')

	Frequency	Percent
Own city	210	35.0
Own county	92	15.3
Another county in Hungary	226	37.7
Outside Hungary	44	7.3
N/A	72	11.9
Total	600	100.0

Most managers equated 'typical' business partners with long-standing ties. Only 10% of the relationships were two years old or younger (Table 3). On the one hand, it is an important finding in itself that long-term business ties are fundamental for SMEs throughout the economy. On the other hand, such responses limit our sample to relatively long-term contractual relationships and exclude novel and short-term dealings. Extending survey data to newly founded relationships may well provide additional insights in the future.

Table 3. **Age of business relationship.**

	Frequency	Percent
2 years or less	55	9.2
3-4 years	61	10.2
5-6 years	83	13.8
7-8 years	57	9.5
9-10 years	66	11.0
More than 10 years	216	36.0
N/A	62	10.3
Total	600	100.0

We asked managers about transaction features that were likely to affect transactions costs and the governance of contracts. We focussed on the three fundamental aspects of transactions that were proposed by Williamson (1979) and the relevance of which has been amply proven by empirical studies (Masten & Saussier 2000): the recurrence of transactions, transactional uncertainty and asset specificity. Asset specificity was captured by geographical distance, the presence of specific investments (by buyer and seller) and the availability of alternatives (for buyer and seller). Each transactional aspect was evaluated using a scale from 1 to 4.

Transactions were very diverse (see Tables 12–17 in the Appendix). Although most relationships had a long history, the parties' dependence on each other and the degree of exchange hazards varied considerably. Thus, the sample includes a mixed array of relationships along the continuum between the extremes of easy-to-replace market contracts and virtual bilateral monopolies (cf. Williamson 1979). Despite its limitations, our data set can be expected to cover a broad range of contractual governance forms in Hungary's entrepreneurial economy.

4. CONTRACT-ENFORCEMENT INSTITUTIONS

Managers were asked to rate the importance of six contract-enforcement institutions for safeguarding their two 'typical' contractual relationships: morality, self-enforcing contract, community norms, personal reputation, the law, and impersonal market reputation. Table 4 shows the questions used to identify the institutions and summarises the distributions and averages of evaluations. Although our data cover all major institutions, a caveat concerning social norms is in order. A businessperson may belong to several (overlapping) communities, in which contract-supporting norms may develop. Our focus is on the closest and most fundamental social community in which businessmen are embedded: friends and the extended family. Nonetheless, norms of other communities (e.g. neighbourly, religious, or professional) may well matter but are not examined here due to lack of data.

All institutions were used by a substantial number of firms. Morality and self-enforcement stand out as they were deemed important or very important in approx. 90% of relationships. Personal reputation, the legal order and impersonal market reputation were less widely relied upon: they were perceived important or very important in 40-50% of all relationships. Norms based on personal (friendly or familial) ties were used least (by less than 20%).

This reflects the relatively highly developed character of the country's legal system and the lack of importance of kinship and community, compared with East Asia's economies (Upham 2002; McMillan & Woodruff 2001; Steer & Sen 2010). It is also in accordance with previous findings about the importance of personal trust in business life in Europe's post-communist region (Hendley et al. 2000; Johnson et al. 2002) as well as the widespread presence of informal, highly personal mechanisms observed in highly developed countries such as the United States (Macaulay 1963) or Germany and Italy (Arrighetti et al. 1997).

Table 4. The importance of contract-enforcement institutions: distribution and average values

Contract-enforcing institution	Question asked: What guarantees that your business partner will perform his promises according to your expectations?	Importance					Average evaluation (1–4)
	How true are the following statements of your relationship? Please rate them from 1 (not at all) to 4 (completely true).	1 (no)	2 (rather no)	3 (rather yes)	4 (yes, very much)	N/A	
Morality	It is important that I have experienced personal trustworthiness [during our cooperation so far] (N=571)	5%	3%	21%	69%	3%	3.89
Self-enforcing contract	It is important that my partner wants to maintain the relationship (N=572)	2%	3%	22%	70%	3%	3.63
Community norms	It helps that we are friends or have family ties with each other (N=566)	62%	15%	12%	8%	4%	1.64
Personal reputation	If my partner performs badly, others will not do business with him in the future (N=515)	17%	27%	26%	23%	8%	2.60
Law	We sign a detailed contract that is enforceable in court (N=572)	33%	18%	14%	31%	3%	2.44
Impersonal market reputation	It is important that my partner is a well-known market actor (N=567)	16%	23%	24%	34%	4%	2.79

5. GOVERNANCE STRATEGIES COMBINING INSTITUTIONS

5.1. CORRELATIONS BETWEEN CONTRACT-ENFORCEMENT INSTITUTIONS

Before delving into more nuanced analysis, it is worth examining simple correlations between contract-enforcement institutions. These measures detect linear relationships, which we have no particular reason to assume. Nonetheless, they may signal patterns of substitution or complementarity. The first observation to note is the lack of negative correlations (Table 5). The use of institutions is either uncorrelated or positively correlated (as in Murrell 2003). This suggests that the institutions used are complements rather than substitutes. One reason may be that transactions with a high level of exchange hazard are protected by 'more of every institution'. Therefore, we included transaction features that influence exchange hazards as control variables (asset specificity, transactional uncertainty, recurrence of transactions). We found that the correlation coefficients became somewhat smaller but kept their signs and significance.[5] That is, a general (linear) substitution between any two contract-enforcement institutions was not observed even for the same types of transactions.

The second observation is that the correlations are rather weak for most pairs of institutions. One exception is the strong link between morality and self-enforcing contracting. These are the two institutional mechanisms on which parties must rely if they are to manage their relationship by bilateral governance (Williamson 1979; Hendley et al. 2002; Murrell 2003), without third-party support.

Table 5. **Correlations between contract-enforcement institutions.**

	Morality	Self-enforcement	Community norms	Personal reputation	Law
Morality Self-enforcement	0.4977*				
Community norms	0.0433	0.0233			
Personal reputation	0.2335*	0.1777*	0.1749*		
Law	0.0857	0.0857	0.1299*	0.1065	
Impersonal reputation	0.2041*	0.2531*	0.2239*	0.2657*	0.2199*

*Significant correlations at 5%, with Bonferroni-correction

5.2. LATENT CLASSES OF GOVERNANCE STRATEGIES

Firms engage in diverse strategies to govern their relationships. Although governance may not take the form of 'discrete structural alternatives' (Williamson 1991), we should still be able to identify ideal-types of governance strategies to which real-life relationships bear a more or less close resemblance (cf. Nee 1992). We therefore assume that it is possible to identify distinct forms of governance in the population of business relationships, and for each relationship to determine the ideal-type governance strategy to which it is closest. Furthermore, it is also reasonable to assume that each governance strategy relies on certain combinations of institutions rather than others (Macneil 1978; Williamson 1979; Hendley et al 2000).

Hence, our formal presumption is that a hidden variable – governance strategy – determines the levels of reliance on different institutional mechanisms. Latent class analysis (LCA) identifies this hidden variable. Latent class modelling assumes that the observed categorical variables (in this case: degrees of reliance on various institutions) are independent, conditional on the unobserved categorical variable of governance strategy. In other words, the response variables are mutually independent within each category of the latent variable (Agresti 2002). Based on a pre-determined number of unobserved classes, the analysis proceeds by estimating the conditional observed variable and class membership probabilities by maximum likelihood. The main difference between standard cluster analysis techniques – e.g. hierarchical or K-means clustering algorithms – and latent class analysis is that the latter is a model-based approach, which postulates a statistical model for the population from which the sample is coming (Vermunt & Magidson, 2002).

Moreover, in contrast to the cluster analysis techniques mentioned above, the LCA method applied here was developed especially for categorical variables, making it more appropriate in this context.[6] The analysis was performed using the poLCA package for R developed by Linzer and Lewis (2011 and 2013), which applies the expectation maximization (EM) algorithm (Dempster et al. 1977) to maximize the log-likelihood function. After estimating models with two, three and four classes, we relied primarily on the Bayesian Information Criterion (BIC) to choose between them. According to Lin and Dayton (1997), BIC is appropriate in the case of basic latent class models due to their relative simplicity.

We compared the results for 2, 3 and 4 classes (Table 6).[7] The Bayesian Information Criterion selected the model with 3 classes. Since maximum likelihood was higher and the Akaike Iinformation Criterion (AIC) was somewhat lower for the model with 4 classes, we also inspected the results of the 4 class version but found that the classes did not lend themselves to meaningful interpretation. This reassured us that the focus on three classes is justified. (As we shall see below, for more complicated models, the other criteria also select 3 classes.)

Table 6. Evaluation of basic latent class models with 2, 3 and 4 classes

Criterion	2 classes	3 classes	4 classes
maximum log-likelihood:	-3499.018	-3406.119	-3361.211
AIC (Akaike Information Criterion)	7072.036	6924.238	6872.421
BIC (Bayesian Information Criterion)	7230.96	7164.773	7194.566
X^2 (Chi-square goodness of fit)	8997.629	3347.811	2799.917

Recall that managers were asked to evaluate the importance of each contract-enforcement institution on a scale 1 to 4. Each latent class is characterised by a distinct probability distribution of responses between 1 (i.e. unimportant) and 4 (i.e. very important). Table 7 illustrates this for law. For relationships in class 1, the probability of a manager choosing '1' was 0.5870; the probability of '2' was 0.2444, etc. How to interpret these results? Class 1 is characterised by the least emphasis on the legal order; class 2 by the heaviest emphasis; and class 3 is in between the two.

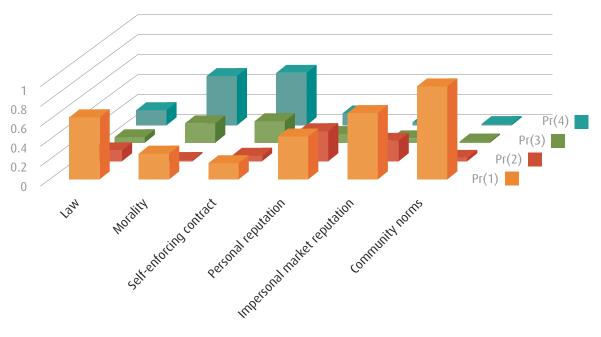##### Table 7. Probability distributions of the importance of law for 3 latent classes

	Pr(1)	Pr(2)	Pr(3)	Pr(4)
class 1	0,6526	0,1185	0,0674	0,1616
class 2	0,3063	0,1704	0,1164	0,4069
class 3	0,236	0,2775	0,2993	0,1872

Graph 1 summarises the probability distributions in each of the three latent classes for all six contract-enforcement institutions.
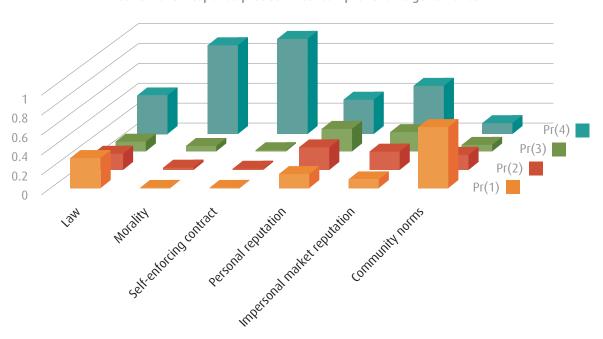
Business relationships that fall into class 1 are characterised overall by a relatively low level of reliance on contract-enforcement institutions. (The easiest way to comprehend the graphs is to look for the modal probability for each institution.) Among the institutions used, morality and self-enforcing contracting clearly stand out, while third-party informal or formal institutions have little weight. This suggests the existence of a *bilateral governance* strategy in the economy.

Graph 1. Latent classes characterised by probability distributions of reliance on six contract-enforcement institutions.

Conditional response probabilities: bilateral governance

Conditional response probabilities: comprehensive governance

Conditional response probabilities: third-party governance

Class 2 is characterised by the greatest reliance on institutional support overall. Bilateral mechanisms (morality and self-enforcement) are even more important than in class 1 but are complemented by increased reliance on each third-party institution: personal reputation, community norms, impersonal reputation, and law. This suggests the existence of a *comprehensive governance* strategy, relying on all institutions.

Relationships in class 3 are less likely to have a strongly bilateral character than those in class 1. Reliance on morality and self-enforcing contracts is less pronounced. Instead, both personal and impersonal third-party institutions are used to a greater extent than in class 1 (but less than in class 3). This implies a third distinct strategy of *third-party governance*. We should bear in mind, however, that bilateral aspects are also likely to be important for these relationships, only less so than in the other two classes.

How large are the classes identified? The estimated population shares of each governance class are given in Table 8. We also estimated, for every relationship, the posterior probability of its belonging to each class. We assigned every relationship to the class with the modal class membership probability. In such a way, we can provide a picture about the distribution of the actual relationships in the sample across latent classes. Both calculations show that comprehensive governance dominates, followed by third-party and bilateral governance.

Table 8. **Population shares of governance classes**

	Bilateral governance	Comprehensive governance	Third-party governance
Estimated population shares	16%	59.5%	24.5%
Predicted class memberships (by modal posterior probability)	13%	64.5%	22.5%

5.3. FACTORS AFFECTING LATENT CLASS MEMBERSHIP

Having identified the main types of governance strategy, we turn to the question of what factors affect a firm's choice of strategy in a given transaction. Their choice is likely to be influenced by features of the transactions between the parties, characteristics of the firms involved and the sectors and markets in which they operate. We extend latent class analysis to account for these factors. We augment the basic model with multinomial logit regressions in order to estimate the prior probabilities of belonging to classes. The poLCA package used employs the "one-step" technique which estimates the effects of covariates as part of the latent class model, since the separate application of a regression model would result in biased coefficient estimates (Linzer & Lewis 2011). The estimation of the augmented model allows us to check the robustness of the simple model. It also enables us to identify the factors that influence governance choice.

Two regression models were defined. The first model included all transactional characteristics as explanatory variables. The second model added data about the firms and their environment. In addition to firm size, sector and regional location (reflecting different levels of economic development), membership in local associations was considered as a variable showing the firm's embeddedness in local social and economic relationships. Presumably, it is associated with more personalised forms of exchange and heavier reliance on informal institutions (Ellickson 1991; Dixit 2003). By contrast, membership in national professional associations and having a multinational or a foreign-based company as a business partner are assumed to be associated with more impersonal forms of exchange, in which formal enforcement play an increased role.

With both latent class regression models, the classes identified closely resembled those of the basic latent class model. The Bayesian Information Criterion selected 3 classes, too (see Tables 18 and 19 in the Appendix). The three classes identified also had roughly similar shares in the population. This suggests the robustness of the basic model in identifying three distinct governance strategies.

What factors influenced the choice among bilateral, comprehensive and third-party governance? Both regression models (Tables 9 and 10) show that comprehensive governance is more likely than bilateral governance for relationships with transaction features that increase exchange hazards. Greater specific investment by the interviewed firm or by its business partner, lack of alternatives for the firm and transactional uncertainty all increase this likelihood. Recurring transactions are also more likely to be supported by comprehensive governance. Third-party governance is more likely than bilateral governance for transactions with specific investment and lack of alternatives (on the partner's side), but the regression shows no difference between these two forms of governance in terms of recurrence or transactional uncertainty.

We propose the following interpretation. Bilateral governance is pursued for relationships with transactions that involve low exchange hazards and limited room for opportunism. As the parties' dependence increases, they must rely on third-party institutions to support contract enforcement. For recurring transactions with a high degree of mutual dependence and uncertainty, comprehensive governance is used. While recurrence supports bilateral governance (Williamson 1979), it can also increase the value of investing in more sophisticated and comprehensive forms of governance (Lazzarini et al. 2004). Here, the second mechanism seems to dominate. Overall, the parties look upon various contract-enforcement institutions as complements in their efforts to secure challenging relationships. However, there is a third class of relationships involving transactions that are less uncertain and less likely to recur. These are supported by a mixture of impersonal and personal third-party institutions, while bilateralism is subdued. In other words, we observe a substitution between bilateral and third-party institutions. We must bear in mind that causation does not run simply from transaction features to governance choice but also the other way around. For example, comprehensive institutional support may encourage parties to undertake highly specific investments. What regressions show is that relationships with certain transaction features are supported by certain combinations of institutions.

Unlike transaction features, characteristics of the firms involved and their operating environment do not influence the choice of governance strategy in significant ways. The Bayesian information criterion improved significantly between the basic LCA model and the LCA regression with transactional variables. However, it somewhat deteriorates for the extended regression with firm and environment variables. In the latter model, the coefficients are also highly dependent on the specification of the model,[8] which suggests that we were unable to grasp important real associations between these factors and governance choice. One exception is firm membership in local associations, which makes bilateral governance more likely in all specifications. To some extent, this result proves our assumption correct that locally embedded firms are likely to put weight on more personal forms of exchange. However, it is unclear why they do not rely more on personal reputation and community norms, too. Unfortunately, our data and method do not allow us to explore this puzzle further.

Table 9. **Population shares of governance classes**

Fit for 3 latent classes:

Comprehensive governance (class 2) vs. Bilateral governance (class 1, default)			
	Coefficient	Std. error	t value	Pr(>|t|)
(Intercept)	-11.59658	2.48998	-4.657	0.000
specific investment by partner***	1.01939	0.27073	3.765	0.000
own specific investment**	0.56635	0.25245	2.243	0.026
lack of alternatives for oneself***	0.67279	0.24065	2.796	0.005
lack of alternatives for partner	0.05111	0.26566	0.192	0.848
recurrence of transactions**	1.12285	0.44536	2.521	0.012
transactional uncertainty*	0.43387	0.25637	1.692	0.092
economic value of relationship	0.00973	0.00657	1.482	0.139
partner outside locality	0.69467	0.73716	0.942	0.347
partner outside county	0.08810	0.56026	0.157	0.875
age of relationship (3-4 years)	1.08289	1.09562	0.988	0.324
age of relationship (5-6 years)	0.82446	1.07966	0.764	0.446
age of relationship (7-8 years)	0.83191	1.06261	0.783	0.434
age of relationship (9-10 years)	0.59627	1.15101	0.518	0.605
age of relationship (over 10 years)	1.59061	0.99329	1.601	0.110

Third-party governance (class 3) vs. Bilateral governance (class 1, default)			
	Coefficient	Std. error	t value	Pr(>|t|)
(Intercept)	-3.43382	1.90929	-1.798	0.073
specific investment by partner***	0.78242	0.29495	2.653	0.008
own specific investment	0.39168	0.26032	1.505	0.133
lack of alternatives for oneself**	0.67240	0.28629	2.349	0.019
lack of alternatives for partner	0.29512	0.31016	0.952	0.342
recurrence of transactions	-0.45770	0.37188	-1.231	0.219
transactional uncertainty	-0.02905	0.32021	-0.091	0.928
economic value of relationship	0.00799	0.00645	1.239	0.216
partner outside locality	0.10784	0.78289	0.138	0.891
partner outside county	0.44274	0.58244	0.760	0.448
age of relationship (3-4 years)	-0.16887	0.98029	-0.172	0.863
age of relationship (5-6 years)	-0.15830	0.95830	-0.165	0.869
age of relationship (7-8 years)	-1.11115	1.03178	-1.077	0.282
age of relationship (9-10 years)	-0.85358	1.02395	-0.834	0.405
age of relationship (over 10 years)	-0.35348	0.85355	-0.414	0.679

Number of observations: 411, number of estimated parameters: 84
Residual degrees of freedom: 327
Maximum log-likelihood: -2507.074
Levels of significance: *<0.1, **<0.05, ***<0.01.

Table 10. Regression results for the augmented latent class model with transactional, firm and environment characteristics as covariates

Fit for 3 latent classes:

Comprehensive governance (class 2) vs. Bilateral governance (class 1, default)			
	Coefficient	Std. error	t value	Pr(>|t|)
(Intercept)	-11.70006	2.64805	-4.418	0.000
specific investment by partner***	1.00362	0.27281	3.679	0.000
own specific investment *	0.49439	0.25628	1.929	0.055
lack of alternatives for oneself**	0.85513	0.33423	2.558	0.011
lack of alternatives for partner	0.01573	0.26500	0.059	0.953
recurrence of transactions**	0.96511	0.43506	2.218	0.027
transactional uncertainty*	0.46953	0.25625	1.832	0.068
number of employees	0.46843	0.49761	0.941	0.347
partner: Hungarian multinational	1.15662	0.78824	1.467	0.143
partner: foreign ownership	-1.51998	1.35153	-1.125	0.262
membership in professional organization	0.06061	0.53580	0.113	0.910
membership in local organization**	-1.40602	0.69356	-2.027	0.043
sector: commerce	-0.84788	0.63937	-1.326	0.186
sector: services	-0.27739	0.65525	-0.423	0.672
site in Budapest	0.67027	0.65338	1.026	0.306
site in West Hungary**	1.83591	0.72836	2.521	0.012
(default: site in East Hungary)				
economic value of relationship	0.00506	0.00425	1.191	0.235
partner outside locality	0.76433	0.85555	0.893	0.372
partner outside county	0.01421	0.58915	0.024	0.981
age of relationship (3-4 years)	1.48340	1.12387	1.320	0.188
age of relationship (5-6 years)	0.40098	1.23432	0.325	0.746
age of relationship (7-8 years)	0.46033	1.26204	0.365	0.716
age of relationship (9-10 years)	0.88147	1.18867	0.742	0.459
age of relationship (over 10 years)	1.25726	1.10888	1.134	0.258

Third-party governance (class 3) vs. Bilateral governance (class 1, default)				
	Coefficient	Std. error	t value	Pr(>|t|)
(Intercept)	-6.93280	2.58470	-2.682	0.008
specific investment by partner***	0.80079	0.33585	2.384	0.018
own specific investment *	0.41123	0.31241	1.316	0.189
lack of alternatives for oneself**	0.97991	0.43832	2.236	0.026
lack of alternatives for partner	0.35334	0.38440	0.919	0.359
recurrence of transactions**	-0.57040	0.49505	-1.152	0.250
transactional uncertainty*	0.03053	0.39048	0.078	0.938
number of employees	1.43399	0.67942	2.111	0.036
partner: Hungarian multinational	0.61589	1.01620	0.606	0.545
partner: foreign ownership	0.25288	1.61642	0.156	0.876
membership in professional organization	0.20391	0.67349	0.303	0.762
membership in local organization**	-2.97786	1.34282	-2.218	0.027
sector: commerce	-0.52893	0.83944	-0.630	0.529
sector: services	0.73198	0.79042	0.926	0.355
site in Budapest	0.37465	0.81399	0.460	0.646
site in West Hungary** (default: site in East Hungary)	1.17581	0.89998	1.306	0.192
economic value of relationship	0.00276	0.00532	0.519	0.604
partner outside locality	0.22167	1.03414	0.214	0.830
partner outside county	0.05487	0.70971	0.077	0.938
age of relationship (3-4 years)	0.25425	1.26285	0.201	0.841
age of relationship (5-6 years)	-0.17069	1.31184	-0.130	0.897
age of relationship (7-8 years)	-1.11115	1.33622	-0.832	0.406
age of relationship (9-10 years)	-0.23810	1.17194	-0.203	0.839
age of relationship (over 10 years)	-0.13428	1.15613	-0.116	0.908

Number of observations: 411, number of estimated parameters: 102
Residual degrees of freedom: 309
Maximum log-likelihood: -2485.824
Levels of significance: *<0.1, **<0.05, ***<0.01.

6. CONCLUSIONS

Our results confirm the general conjecture of new institutional economics that enterprises rely on a broad range of contract-enforcement institutions in modern economies. We were also able to identify distinct strategies of combining these institutions for the governance of interfirm relationships. Scholars have focused on the distinction between formal and informal enforcement of contracts. Our results suggest that the crucial governance choice is not between informal or formal institutions. Instead, it is between reliance on the institutions of bilateral governance (i.e. morality and self-enforcing contracts) and reliance on institutions based on formal or informal third-party enforcement (personal reputation, impersonal market reputation, community norms and the legal system).

We identified three typical governance strategies. *Bilateral governance* is used for exchanges with low hazards. For more challenging transactions, firms shift to one of two strategies. As the threat of opportunism increases due to specific assets and lack of alternatives, some relationships shift to *third-party governance*. This is characterised by an increased reliance on a combination of informal and formal third-party institutions and a lesser – though still significant – use of bilateralism. In these cases, we see a partial substitution between bilateral and third-party institutions.

For recurrent transactions with even greater hazards (due to asset specificity, lack of alternatives and transactional uncertainty), firms use a third strategy that we termed *comprehensive governance*. This is characterised by relatively high reliance on all types of contract-enforcement institutions. Here, bilateral and third-party institutions are used as complements. Morality and self-enforcement are even more important than under bilateral governance and they are complemented by a mixture of informal and formal third-party institutions.

Much academic debate revolves around the question if contract-enforcement institutions are used as complements or substitutes. The three governance strategies reveal that third-party institutions can either partly (but never fully) substitute for first- and second-party institutions, or – more often – complement them in order to tackle increased contractual hazards.

Stronger embeddedness in local society is associated with a greater likelihood of using bilateral governance. Otherwise, firm characteristics and the economic environment of business relationships do not seem to have much effect on governance strategies. The influence of transaction features dominates.

Although our results are fairly representative of established business relationships across the economy of a mid-sized European country, there are two important caveats. First, our data contained very few newly-minted relationships, which may be characterised by different governance strategies. Second, our findings may be country-specific to some extent. The clear and strong influence of transaction features rather than environmental factors suggests that the typology of governance strategies may apply to a broader range of countries. However, this remains to be proven.

APPENDIX

Table 12. Lack of alternatives for the partner

('If you unexpectedly broke your relationship, it would be difficult for your business partner to find another enterprise that could replace you': 1 – not true at all; 4 – completely true)

Evaluation	Frequency	Percent
1	227	37.8
2	154	25.7
3	114	19.0
4	69	11.5
N/A	36	6.0
Total	600	100.0

Table 13. Lack of alternatives for the firm

('If your business partner unexpectedly broke your relationship, it would be difficult for you to find another enterprise that could replace him': 1 – not true at all; 4 – completely true)

Evaluation	Frequency	Percent
1	140	23.3
2	152	25.3
3	158	26.3
4	129	21.5
N/A	21	3.5
Total	600	100.0

Table 14. Specific investment by the firm

('You made significant investment so that you could use your business partner's product or service' (in relationship with supplier) and 'Your product or service is tailored to your partner's expectations' (in relationship with buyer): 1 – not true at all; 4 – completely true)

Evaluation	Frequency	Percent
1	101	16.8
2	91	15.2
3	123	20.5
4	263	43.8
N/A	22	3.7
Total	600	100.0

Table 15. Specific investment by the partner

('Your supplier's product or service is tailored to your expectations' (in relationship with supplier) and 'Your customer made significant investment so that he could use your product or service' (in relationship with buyer): 1 – not true at all; 4 – completely true)

Evaluation	Frequency	Percent
1	169	28.2
2	100	16.7
3	134	22.3
4	167	27.8
N/A	30	5.0
Total	600	100.0

Table 16. Recurrence of transactions

('You will need your supplier's product or service in the near future [in 2-3 years] as well' (in relationship with supplier) and 'Your business partner will need your product or service in the near future [in 2-3 years] as well' (in relationship with buyer): 1 – not true at all; 4 – completely true)

Evaluation	Frequency	Percent
1	12	2.0
2	30	5.0
3	144	24.0
4	388	64.7
N/A	26	4.3
Total	600	100.0

Table 17. Transactional uncertainty

('In your relationship, you frequently need to adapt to changing circumstances and make changes to initial plans': 1 – not true at all; 4 – completely true)

Evaluation	Frequency	Percent
1	64	10.7
2	88	14.7
3	210	35.0
4	213	35.5
N/A	25	4.2
Total	600	100.0

Table 18. Evaluation of latent class regression models (transaction characteristics) with 2, 3 and 4 classes

Criterion	2 classes	3 classes	4 classes
maximum log-likelihood:	-2687.178	-2507.074	-2451.221
AIC	5472.356	5182.148	5136.443
BIC	5670.793	5519.71	5606.618
X^2 (Chi-square goodness of fit)	8603.886	4612.51	3257.112

Table 19. Evaluation of latent class regression models (transaction, firm and environment characteristics) with 2, 3 and 4 classes

Criterion	2 classes	3 classes	4 classes
maximum log-likelihood:	-2593.829	-2485.824	-2696.608
AIC	5307.659	5175.648	5681.216
BIC	5548.774	5585.545	5707.725
X^2 (Chi-square goodness of fit)	10880.62	4417.595	14329.45

FOOTNOTES

[1] Fafchamps (1996) and Kähkönen & Meagher (2001) conducted similar surveys for two African countries (Ghana and Tanzania, respectively) but formal institutions were basically not used in these underdeveloped contexts.

[2] The survey was carried out by HETFA Research Institute in collaboration with Bell Research Ltd. Among the firms, 48% had 5-9 employees, 52% had 10-49 employees.

[3] The questionnaire was part of a larger survey, which focussed on non-agricultural firms for reasons unrelated to our research.

[4] See http://www.doingbusiness.org/rankings (accessed 10.02.2017).

[5] Except for the correlation between law and community norms, which lost its significance.

[6] Magidson and Vermunt (2002) found that latent class models outperform K-means clustering in many respects even in the case of continuous response variables.

[7] The maximum number of iterations was 2000 during every single estimation. We ran the algorithm 100 times for each model, except for the ones with 4 classes augmented with multinomial logistic regression (see 5.3. below), for which we performed the analysis only 5 times. The reason for the latter was computational constraints – the estimation of these highly complex models was very costly in terms of time.

[8] That is, which variables are included as covariates.

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