

Firms' Non-Compliant Behavior: Do Networks Matter? The Case of Bulgaria¹

Abstract

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Non-compliant behavior of firms and the evolution and use of informal networks in transition countries have attracted significant interest among economists in recent years. Most extant studies use corruption as a proxy for non-compliant behavior and look for causes and consequences of corrupt behavior. Dynamic and static game-theoretic approaches conclude that bribery is inefficient yet when dishonest bureaucrats exist so does corruption. We take a different approach toward the study of this issue and look at corruption as means to engage in non-compliant behavior. We argue that corruption (bribery) is a substitute to being connected and statistically test various forms of this proposition in the context of Bulgaria. Our findings show that bribery is used primarily when companies are engaged in hidden economic activities and circumvention of the law, while networks show to be the only significant variable when firms attempt to influence new legislation or acquire public procurement contracts.

Keywords : non-compliance, corruption, bribes, informal networks, business associations, survey data.

JEL classification: D73, E26, L14.

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1. Introduction

Non-compliant behavior of firms, defined as every behavior of the firm, which is in violation of existing (formal) regulations and procedures and the evolution and use of informal networks in transition countries have attracted significant interest among economists in recent years. Corruption itself is among the most prominent examples of non-compliant behavior, but it is also a proxy for presence of other forms of non-compliance, being a tool to achieve certain goals circumventing some regulations. Lambert-Mogiliansky et al. (2007) define corruption as the abuse of public office for private benefit, and is seen as one of the most costly activities for society, which not only decreases the share and quality of public services, but it also hampers economic growth, increases poverty, and undermines the legitimacy of the state (Lambert-Mogiliansky et al. 2007). Corruption naturally occurs informally with its social infrastructure being informal networks of principals, agents and law enforcement servants. However in countries or market segments with strong institutional failure (i.e. extremely low levels of law enforcement) quasi-markets exist based on bribes as a currency, where the role of network participation is negligible. Still major questions about the causes and consequences of non-compliance have no answers mostly due to the lack of reliable data and first-hand experience with informal networks. This is especially true for the post-communist countries. We try to fill this gap by studying four types of non-compliant behavior by Bulgarian firms. In this country, the leader of a political party, which have been in the coalition cabinets for the last 6 years and holds the mandate of the current government, freely admits (on the eve of 2005 general elections) that each party has its own loops of firms, which support the party and in turn the party, when in power, returns the favors² in terms of laws and procurement and concession contracts; between 54 % (in 2003) and 35 % (in 2005) of companies that have won public procurement contracts admit that they have paid bribes;

² Shouto na Slavi (Slavi's Show), BTV, June 23, 2005

and finally shadow economy accounts for 25 to 30 % of GDP (Center for the Study of Democracy, 2007). Hence it is natural to consider a model, where firms might target four “production” goals – (a) affect new legislation, favoring the firm; (b) circumvent the laws in order to decrease transaction or production costs; (c) hide a portion of their activities, resulting in decreased transfers to the government; and (d) obtain public procurement contracts. The “resources for the firms in the model are two – bribes and networks (formal and informal). To realize their goals, firms may utilize networks (cooperate in production of these ends) and/or use bribes (buy directly the product or service from the respective person/institution).

2. Different approaches to non-compliance

So far, most studies of corruption examine the causes and consequences of corrupt behavior (Bajada and Schneider eds. 2005; Schneider and Enste 2000) or discuss the estimates of the underground economy from a theoretical (Tanzi 1999) or empirical (Breusch 2005) point of view. There are also game-theoretic models of corruption. Ahlin and Bose (2007) develop a dynamic two-stage game to study the relationship between bribes, inefficiency, and bureaucratic delay. Their conclusion is that bribery is inefficient and increasing the number of honest officials increases local inefficiency because it gives incentives to corrupt officials to ask for larger bribes and allocate licenses to non-productive applicants. Another game-theoretic model is the one of Lambert-Mogiliansky et al. (2007). Their game models “petty corruption” and sheds light on two much advocated anti-corruption policies – the single window policy and the rotation of bureaucrats, arguing that from the results of the game it cannot be concluded that either anti-corruption mechanism yields socially preferred results. The question of how to fight corruption has also been recently addressed by Olken (2007) in his experimental examination of the effects of some anti-

corruption policies. He performs an experiment in 600 Indonesian villages who are about to engage in road enhancing projects, to conclude that a top-down monitoring approach has larger effect in decreasing corruption than does an increased grassroots participation.

The common denominator of most existing studies on the subject of corruption is that corruption is treated as a dependent variable. The paper proposes a different approach. It looks at whether informal networks matter for non-compliant behavior, and whether corruption (bribe) is a substitute for networks when they do not exist. Thus, in the analysis, bribery is an explanatory variable. This is a novel approach in two ways – first, it puts corruption on the right-hand side of the equation and uses it to explain several different non-compliant behaviors of firms; second, the fact that we are able to show that certain networks are very significant for non-compliance, brings the non-compliance research a step forward. The paper also contributes with a unique dataset, and the conclusions we make prompt questions to be explored in future research.

Grossman (1977) and Gabor (1979) studied the well-organized non-compliant secondary economy during socialism, while the seminal work of De Soto (1989) showed that informal laws might work better than formal ones in Peru. Within the non-compliant behavior literature institutionalist theories prevail. They are based on the rent-seeking approach (Tanzi, 1982; Brennan and Buchanan, 1980, 1985; Schneider 1986; Feige, 1986; Aslund, 1996), maximizing mechanism or rational response to institutional inefficiencies. Institutions generate and enforce rules of behavior and rules of procedure, with significant impact on transaction costs. Institutional change can occur in accordance to society's rules of procedure (prescribed) or in broad violation to them (proscribed) (Feige 1997). Non-compliance with formal rules changes institutions. Eggertsson (1997) points out that “the primary weakness of the economics of institutions is its limited understanding of the amalgam of formal and informal rules and their attendant enforcement mechanisms.” Coherence between formal and

informal norms simplifies the task of defining and enforcing acceptable behavior. Observation of widespread non-compliant behavior signals a formal system in distress.

Non-compliant behavior (both of firms and individuals) has been extensively modeled also via game-theoretic approaches for corruption: agency problems (Acemoglu and Verdier, 1998); conditionalities of different types of corruption equilibrium (Dabla-Norris, 2000); the cost and effectiveness of corruption (Shleifer and Vishny, 1993); extortion behavior in transition countries (Cabelkova, 2001); and explaining why large companies (software manufacturers) may tolerate property-rights breach in the beginning of transition while gradually introducing strong measures to make companies comply (Kunin, 2001).

A large portion of literature also focuses on the causes and consequences of non-compliant behavior. Available research argues (RRT Hungary Document 25, 1993 - for and Stulhofer, 1999 and Feige, 1999 - against) that informal economy in transitional countries is highly path-dependent, i.e. higher rates of non-compliance lead to slow economic growth, which might stay in equilibrium because costs for countering non-compliance outweigh expected benefits, at least in the short to medium run (Mauro 1995, 2002). At the same time, Lacko (2000) shows that higher levels of hidden economy prior to 1989 leads to faster transition and growth in 1989-95. Corruption, as we already pointed out (for detailed discussion of corruption see Rose-Ackerman, 1978; Klitgaard 1988 Werlin, 1994; Kaminski, 1989, 1997; Graf, 2000), has been a central concept (and sometimes wrongly a substitute) for understanding non-compliance. Most studies explore the difference between “good” corruption (“virtuous groups”) defined as bribes to overcome inefficient regulation, where the company, the civil servant and the economy as a whole are better-off, and “bad” corruption (“vicious groups”) (Krueger, 1993; Feige, 1997).

Until recently, the prevailing understanding of corruption was that it appears at the intersection of the public and private sectors (Feige, 1997). The Asian crisis and the Enron

case have shifted attention towards corporate corruption (Sullivan, 2001). Recent studies in Bulgaria (Yalamov and Belev, 2002 and Coalition 2000, 2003) also suggest that inter-firm corruption and non-compliant behavior within the private sector is a serious problem for an emerging economy. More than half of companies believe that corruption within private sector (within their supply/distribution chains) is at least of equal importance as corruption in the public sector and only a third of lesser importance (Yalamov, 2003b).

3. The role of business groups and networks

A striking feature of East European Countries' (EEC) economies is the prominent role of business groups, informal business associations and circles (networks) of trust, based on inherited relationships from security services, sport clubs and economic and party *nomenklatura*. A new school of thought (Sabel, 1993; Stark, Bruszt, 1998 and others) has emerged to fill the analytic vacuum in this area – unlike its rivals (neo-liberals and neo-statists), this theory abstains from imported solutions, and ideal-typical theorizing. Instead, its scholars have asked a rather pragmatic question: what is the best possible solution, given the corrupt and incompetent bureaucracy, the non-existent market infrastructure, and the lack of experience with neither democracy nor capitalism? One institutional liability endemic to many post-communist countries involves dense networks of politico-economic elites, a legacy of the planned economy, in which hierarchical control coupled with production targets and ineffective monitoring gave rise to long-term collusions between enterprise managers, directors, and the industrial policy-makers. For the Russian case, Ledeneva (1997, 1998) argues that the system of informal exchange arose in Russia as a response to the crippled economy and took a life on its own, which continues long after the advent of democracy. Informal networks damage the proper functioning of the economy but are the only viable legacy of the past.

No surprisingly, these networks have been either assumed away, or branded as inherently corrupt by the neo-statist and neo-liberal analysts, *de facto* reducing their inquiry to a purely theoretical polemic about what could be achieved without given constraints. In a recent study of public procurement contracts (Center for the Study of Democracy, 2007) it is argued that the quasi-market for procurement based on bribes (petty/administrative corruption) has been already captured (institutionalized) by informal networks close to parties in power. For five years firms that participate in procurement bids decreased from 43 % (in 2002) to 14 % (in 2007). The challenge of the networks theory, on the other hand, is to realize the potential of networks to contribute to industrial restructuring, and a sound long-term economic policy. Another challenge is to find the circumstances that would allow networks to be translated from liabilities into resources. The paper attempts to address some of these unconventional characteristics of networks by theorizing a substitute relationship between bribery and participation in networks.

Although there are many works dealing with network issues – for example studies that look at interest group formation (Olson, 1965; Grier, Munger and Roberts, 1991), organization and activity (Austen-Smith 1981, 1996; Moe, 1981; Johnson, 1988), membership and objectives (Rothenberg 1988, 1992) - there is little systematic empirical evidence on business-groups or other network formation in a transitional context, especially in the case of Bulgaria. Yet, Bulgaria is an interesting example where group influence on political, economic and social life is portrayed. Thus, the formal analysis is based on a dataset extracted from a national survey conducted in 2004, to examine the effects of different types on networks on firm non-compliant behavior.

Three major motivators form the causal mechanism for network participation: (a) networks lower transactions costs and make information exchange more efficient; (b) they provide firms with the opportunity to be included in enterprise restructuring and forming the

[new] “rules of the game”; and (c) networks give the opportunity to protect the *status quo* and extort resources from other players. Khana and Rivkin (2001) suggest that business groups affect a broad pattern of economic development and average group member’s profit is higher than non-group member’s.

4. Theory and Hypotheses

The major issue that we address here is whether there are systematic differences in firms’ non-compliant behavior. We want to test whether firms which are members of business networks (in particular - formal business associations and inherited networks prior to 1989) behave in a different way than firms which aren’t. Furthermore, we look for specific characteristics and types of networks to see whether there is any pattern in the relationship between membership in specific networks (and its roots) and non-compliant behavior. The paper contributes on several levels. First, it adds *new insights* to some fundamental questions about non-compliance and the use of bribery. Second, it provides a large reliable and unique dataset of the specifically rich practical experience of Bulgaria in the area of formal and informal networks and company behavior.

We explore the following two main hypotheses: First, informal networks create a corruption equilibrium, which can be penetrated by newcomers only through offering bribes. Second, the origin of these informal networks lies with organizations of the former communist regime (sports clubs, party organizations, etc.). The inheritance of the former security services is quite more complicated to be studied with the methodology in this paper, however Hajdinjak (2002) provides a lot of insight on ways of utilizing these networks in Southeast Europe, especially through privatization of former smuggling channels supported by the communist state.

The first hypothesis argues that informally connected firms create corrupt environment, which non-connected firms can penetrate only through material inducements, such as bribes. Bribes compensate the lack of network capabilities (bribes and networks are substitutes) [in achieving procurement contracts, influencing laws, hiding economic activity and circumventing unfavorable regulations]. The rationale behind that hypothesis is that both networks and bribes are instruments/means to achieve certain goals (probably with different efficiency). Existence and usage of networks presume longer-term cooperation between agents and somewhat stable constellations with self-enforcement power (hierarchy), while bribes are on the spot (market) grease money and transaction by transaction competitive. While bribes (as more market oriented) could be easily a subject of firms' choice, networks have a more complicated interpretation. Firms could be part of networks by the nature of their origin, past of the owners and managers. Firms could also rationally decide to join a formal or informal network in order to receive certain gains from the right to utilize these networks. We presume if firm participates in a network, it uses it, although not necessarily always successfully. For those firms, which could not join specific networks (not allowed to, too costly membership, etc.) bribery remains the alternative to optimize their activity. Those in networks don't have to bribe (on the spot) because rules and procedures of networks guarantee certain levels of optimality. Thus, we expect non-network members to pay bribes more often than network members.

There is also another route of thought, where networks are seen as institutions that will grease bribery (minimizing transaction cost of bribery or make it simply possible). In this respect, network membership would be positively associated with bribery. This is the corruption model of traditional market economies, such as recent scandals involving German companies.

Table 1. Bribes give those, who have no connections

	Frequency	Percent	Percent (DK/NA excluded)
Completely agree	45	13.8	18.3
Rather agree than not	80	24.6	32.5
Rather disagree than agree	57	17.5	23.2
Completely disagree	64	19.7	26.0
Don't know/No answer	79	24.3	
Total	325	100.0	100

Although more firms agree (50.8 %) than disagree (49.2 %) with the statement, the 95% confidence interval for the mean of average agreement (0.4452, 0.5710) does not allow³ accepting the hypothesis, based on judgments of interviewees. The hypothesis is borrowed from the results of a statistical analysis of the 1999 Business Environment and Enterprise Performance Survey of the World Bank (Hellman, Johnson, Kaufman, 2002; Yankova, 2003). The survey shows that in very corrupt countries in Central and Eastern Europe firms with foreign direct investment offer up to 10 % more often bribes to domestic legislators than domestic firms do. One possible explanation for this finding is that domestic firms engage in an informal system of exchange of favors through network participation that is closed to foreign firms. The idea here is that due to the fact that foreign firms have less personal connections with people in power, they resort to paying bribes⁴. In other words, we argue that in countries with predominantly corrupt practices, what newcomers to the system cannot achieve through informal non-monetary exchange, they achieve through offering bribes. We test this hypothesis within the Bulgarian context.

We explore the relationship between bribery and cronyism, and check to see which firms are more likely to resort to one as opposed to the other form of illegitimate influence.

³ Hereafter if not stated otherwise, all confidence levels are set at 95%

⁴ Decades after the adoption of the US Foreign Corrupt Practices Act (1977), European companies have been in advantageous position to bribe abroad, and even tax-deduct it. Only in mid 1990s the process of incrimination of bribes abroad concluded in Europe within the OECD framework.

The second hypothesis reflects the interaction between formal and informal networks. More specifically, it aims to elucidate the correlation between former sports and party organizations, the privatization process, and the extent of informal ties in the present economy. Our theory is that the ties developed in the “social-capital” (Putnam 2001) networks of the communist past improve the organization and coordination that newly born entrepreneurs lack in the immediate aftermath of market economy. In this respect, we explore to what extent the informal networks are a continuation of former formal association.

In the following section we proceed with a discussion of the model and data description. We then test the influence of business and informal associations on non-compliant behavior and performance and report the results.

5. Model, data description and testing of hypotheses

The data we use to test out hypotheses is a unique dataset constructed from a survey of 325 Bulgarian companies executed in 2004 by *Vitosha research* agency. The operationalization of the four dependent variables is the following. *Shaping of the law (LAW)* measures whether a firm influences new legislation or not. While it might be preferred to have a variable that will show the frequency of attempts to influence the law and the success rate, it is almost impossible to gather such information. Therefore, as the next best thing we collected information of whether a company has been engaged in some sort of influence over legislation. *LAW*, then, is a dichotomous variable which equals 0 if a firm has no possibility to influence law, and 1 if it can influence the formation of laws through one of four channels (by business-associations, by lobby group, by direct connections of the firm with highly-ranked employees, and by other ways).⁵ The second dependent variable, *circumvention of regulations (CIRCUMVE)*, measures the readiness/willingness to by-pass regulations or solve problems

⁵ Don't know/missing values are interpreted as no influence to laws.

arisen from regulations through unofficial payments or through the use of connections. *CIRCUMVE* is a normalized product of average level of regulatory burdens' perceptions and readiness/willingness to bribe in response to a certain administrative problem. The values of *CIRCUMVE* are in the range of [0; 0.9]. *Obtain contracts (CONTRACT)* is the third way we operationalize non-compliant behavior. *CONTRACT* is a dichotomous variable which takes value of 1 if a firm has at least one contract with the public administration and takes a value of zero otherwise. The last dependent variable we use is a variable we call *INFORMAL*, which is a proxy of the level of hiding (informality) of firms. Following the methodology of most projective tests (in psychology and economics), we would assume that specific questions about the sector as a whole would provide answers, based on firm's own experience. Assuming that informality (hiding) is rational response to high taxes and factor of competitiveness, one might presume that firms will try to work at or around average levels of informality for their sector. Much higher levels than the average might increase the risk of compliance inspections and checks. Much lower levels, on the other hand, might hurt the competitiveness. Our measure of informality of sector is based on a special index constructed and tested in Yalamov (2003a). Index *I*, which estimates the hidden economy in the sector and represents an average frequency assessment of the type of "concealed" activities in the sector (F_a, F_b, \dots, F_m), weighted by the activities associated with the hidden economy (A_a, A_b, \dots, A_m), where a to m refer to 12 predefined and one user-defined forms of hiding activities⁶.

$$I = \frac{F_a * A_a + \dots + F_m * A_m}{A_a * \text{MIN}(F_a, 1) + \dots + A_m * \text{MIN}(F_m, 1)}$$

⁶ a) employment without any contract; b) employed on contract with hidden clauses; c) Profit-hiding; d) hiding of accise taxes, custom duties, etc.; e) bribes; f) non-issuing receipts and invoices; g) declaring lower turnover; h) large-scale cash-transfers; i) procurement without tenders and in violation/circumvention of regulations; j) barter deals not accounted properly; k) illegal import or export; l) VAT fraud; m) user defined.

The A-s take a value of 1 if the respondent answered that s/he refers the specific activity to the hidden economy and a value of 0 if s/he does not. The Index I undefined both when the respondent has associated none of the activities mentioned with a hidden economy, and when s/he has found it difficult to specify the frequency of occurrence in his/her sector of all activities associated with the hidden economy. F-s take the following values: 1 "Always," 2 "In most cases," 3 "Sometimes," 4 "Never." Missing values are coded 0. The numerator sums the estimates of the frequency of the respective number of activities stated by the respondent as forming a hidden economy and estimated in terms of frequency of occurrence in his sector. Each of the sums in the denominator is zero when the relevant estimate of frequency is absent ($F_x=0$) or no respective activity is stated in the previous question ($A_x=0$). The values of the index range from 1 to 4, with 1 indicating completely hidden and gray economy and 4 denoting a 100% reported and licit economy. INFORMAL is then computed $(4-I)/3$ and holds values within the range [0; 1]. Values could be interpreted as level of informality (0 – none, 1 – full).

We include the following independent variables:

CORRUPT – a dichotomous variable which signifies whether a firm has engaged in at least one bribery (at least one positive answer, coded 1, to question about paying unofficially or making a gift for a list of 15 predefined and two user-defined services). The variable takes values of 0 (if not engaged in bribery) and 1 (if engaged).

BA (business association) – dummy variable for whether a firm is a member of a business association – equals 1 for “yes”, 0 for “no”.

InA – dummy variable for membership (value 1) in an informal, loose association, group or network of businesses or business leaders, (otherwise 0).

PASTADM – dummy for whether “owners/managers have experience in the state administration in the past”, equals 1 when true, 0 otherwise.

EXP1989 – dummy for high-profile experience of managers/owners before 1989, equals 1 when true, 0 otherwise.

PASTPOL – dummy for experience in politics of managers/owners in the past, equals 1 when true, 0 otherwise.

SPORT – dummy for past/current memberships of managers/owners in sport clubs, equals 1 when true, 0 otherwise.

POLITICS – dummy for current active involvement of owners/managers in politics, equals 1 when true, 0 otherwise.

ALLNET2 – dummy variable constructed as a max function of all network variables, which equals one when a firm has participated in at least one network.

Our models also include a series of control variables. The first group of controls we use is the firm's sector. We control for sector by type. The following sectors have been identified - agriculture, hotel and restaurants, services, construction, transport, trade, retail, utilities, industry, education, health, and IT sector. All variables are dummies equal to 1 if the firm has identified with the respective sector and equal 0 otherwise. The second group of controls we include are several dummies for size of the firm. Firms that have 1-50 employees are coded as small, firms with 51-500 are coded as medium-sized, and firms with more than 500 employees are coded as large.

We use ordinary least squares and logistic regression to estimate the models for the first hypothesis. The choice of estimation tools is dictated by the nature of the data. Two of our dependent variables, *Law* and *Contract*, are continuous and OLS is seems like the default method to use. The models here are of the type:

$$f(x_i) = y_i + \varepsilon_i,$$

where x_i is continuous, and $y_i = \alpha + \beta y_i$, while the other two dependent variables, *Informal* and *Circumve*, are binary where a logistic regression is a more appropriate tool to use.

The specific models we test have the following formula:

$$Y_i = \alpha + \beta_1 * corrupt + \beta_2 * networks + \beta_3 * sector + \beta_4 * size + \epsilon_i,$$

where $Y_i = \{Law, Contract, Informal, Circumvent\}$.

The estimated results are presented in Table 2.

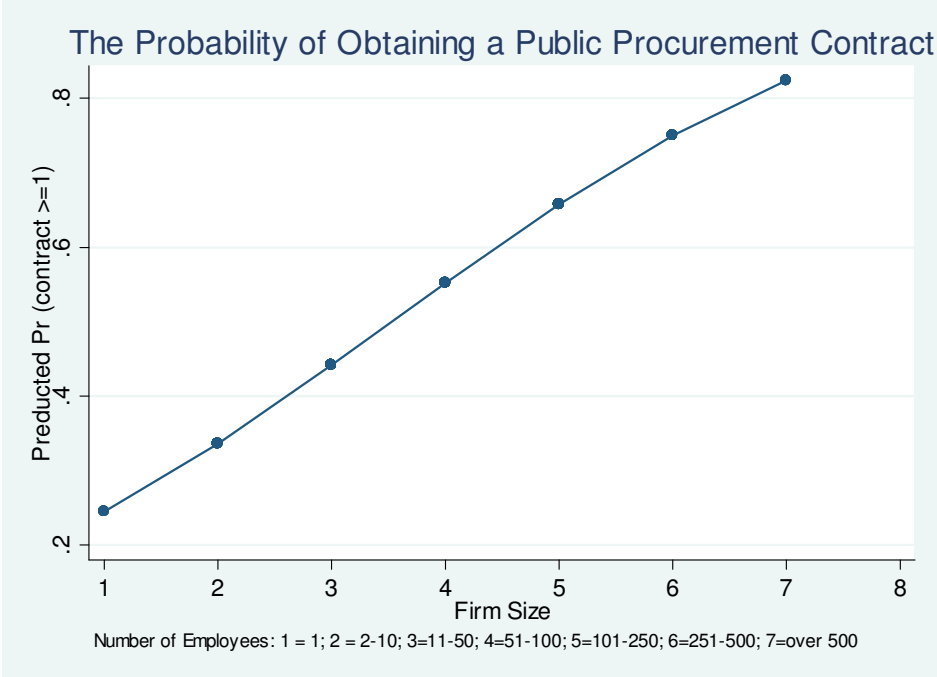
Table 2. Logistic Regression Analysis of Firms' Behavior in Bulgaria.

Dependent Variables	<i>Obtaining Contracts</i>		<i>Influencing Law-making</i>	
<i>Corrupt</i>	.08 (.27)	.07 (.28)	-.35 (.33)	.14 (.38)
<i>Any Network Involvement</i>	.42 (.26)	--	1.69*** (.37)	--
Network type:				
<i>Past Administration</i>	--	.03 (.28)	--	.10 (.36)
<i>Pre-1989 Experience</i>	--	.19 (.39)	--	-.12 (.46)
<i>Past Political Experience</i>	--	1.57 (1.21)	--	-.93 (1.48)
<i>Sport Clubs</i>	--	1.04 (1.24)	--	2.66** (1.3)
<i>Political Involvement</i>	--	1.11 (.94)	--	1.78** (.90)
<i>Business Association</i>	--	.30 (.35)	--	2.52*** (.38)
<i>Informal Association</i>	--	.86* (.49)	--	1.34*** (.51)
Sector type:				
<i>Hotel</i>	-2.24* (1.27)	-1.92 (1.29)	--	--
<i>Retail</i>	-1.45* (.73)	-1.28* (.75)	-.41 (.83)	-.09 (.96)
Firm Size:				
<i>Medium-size</i>	.43 (.28)	.36 (.29)	.82*** (.31)	.62* (.34)
<i>Large</i>	1.65* (.87)	1.75** (.88)	2.24*** (.78)	2.62*** (.85)
<i>Constant</i>	.19 (.65)	.02 (.67)	-2.53*** (.32)	-2.75*** (.83)
N	289	289	318	318
<i>Pseudo R²</i>	.09	.11	.17	.33

Note: Unstandardized coefficients are reported. Standard errors are in parenthesis. The significance levels are * when $p < 0.10$, ** when $p < 0.05$, *** when $p < 0.01$. For “sector type” and “firm size” only significant results are presented for the purpose of space.

The results from the first model displayed in Table 2 show that firms, which are in the hotel and retail business have less likelihood of getting public procurement contracts. Their coefficients are negative and statistically significant with 90 % confidence on average. These results are not surprising given that public procurement contracts are usually related to large-scale road construction, transport projects, and other similar industries. The coefficient for ‘large firms’ shows that they have a significantly higher chance of obtaining public procurement contracts than small firms. A logistic regression which reports odds ratios (results not shown in Table 2) shows that retail firms have 0.23 times the odds of getting a public procurement contract than do other sectors, while large firms have 5 times higher odds of getting such contracts. The relationship between firm size and the probability of obtaining a public service contract can be easily portrayed graphically (see Figure 1 below). From Figure 1 we can see that a company with staff of 10 people or less has only about 35 % predicted probability of getting a contract, while a firm with staff of 500 and more has more than 80 % chance of securing a public service contract. Interestingly, when we estimate the full model, with all network types included, the participation in informal networks is the only network which shows to be significant. Its positive coefficient means that firms which take part in informal networks are more likely to win public procurement contracts than the ones which do not participate in such groups.

Figure 1. Firm size and the probability of obtaining a public service contract.



The results from the second set of model in Table 2, show that participation in at least one network, as well as being a medium or large-sized firm predisposes for a higher likelihood of influencing legislation. From the logistic regression analysis (not shown here) we learn that the odds of influencing law of a firm which is part of a network are 5 times the odds of a firm which is not part of a network. Furthermore, a medium-sized company has twice the odds of influencing legislation, while a large firm has 9 times the odds of doing so, in comparison to small firms.

This result can be linked to the results from the model of hidden economic activities (see Table 3). In the legislation model we see that larger firms substantially influence laws, and thus make the rules of the game more favorable to themselves, while smaller businesses which cannot influence law are driven to hiding economic activities in order to compensate marginal losses from other firms.

We also tested non-compliance targets in terms of hiding and circumvention of the law. The results from these tests are presented in Table 3. Here we see that corruption shows

to be significant for all four models. All four coefficients are positive, which means that when a firm has admitted to having paid bribes it is more likely that it will resort to hiding profits and attempts to by-pass the law.

Table 3. Regression Analysis of Firms' Non-compliant Behavior in Bulgaria.

Dependent Variables	<i>Hidden Economic Activities</i>		<i>Circumventing Regulations</i>	
<i>Corrupt</i>	.11*** (.03)	.11*** (.03)	.11*** (.03)	.10*** (.03)
<i>Any Network Involvement</i>	.06** (.03)	--	-.003 (.03)	--
Network type:				
<i>Past Administration</i>	--	.07** (.03)	--	.02 (.03)
<i>Pre-1989 Experience</i>	--	.05 (.04)	--	.01 (.03)
<i>Past Political Experience</i>	--	.05 (.10)	--	-.03 (.07)
<i>Sport Clubs</i>	--	-.15 (.10)	--	-.10 (.07)
<i>Political Involvement</i>	--	.08 (.09)	--	-.04 (.09)
<i>Business Association</i>	--	-.003 (.03)	--	-.06* (.03)
<i>Informal Association</i>	--	-.02 (.04)	--	.03 (.04)
Sector type:				
<i>Service Firm</i>	.26** (.11)	.28** (.11)	.03 (.10)	.05 (.11)
Firm Size:				
<i>Medium-size</i>	-.08*** (.03)	-.06** (.03)	-.02 (.03)	-.002 (.03)
<i>Constant</i>	.20*** (.07)	.22*** (.02)	.35*** (.07)	.36*** (.07)
N	306	306	182	182
<i>Adjusted R²</i>	.08	.08	.10	.10

Note: Unstandardized coefficients are reported. Standard errors are in parenthesis. The significance levels are * when $p < 0.10$, ** when $p < 0.05$, *** when $p < 0.01$. For “sector type” and “firm size” only significant results are presented for the purpose of space.

Concerning the second hypothesis, namely the relationships between firms' participation in formal business associations and informal networks from one side and different past experience of managers, we conclude that experience in state administration and politics in the past significantly explains participation in informal/loose association of businesses/business leaders, while high-profile experience prior to 1989 and former involvement in sports clubs of firms' owners significantly explains participation in formal associations (see Table 4).

Table 4. Relationships between current participation in associations and past experience of firms' owners and managers

	Past administration	High-profile experience prior to 1989	Experience in the past in politics	Former membership in sport clubs	Current involvement in politics
(Formal) Business associations		*** (0.001)		* (0.053)	
Informal associations	** (0.014)		* (0.073)		

Note: Chi-square level of significance is reported in parentheses

Theoretically, one potential problem with our model is the possibility of endogeneity of corruption. We performed a Hausman endogeneity test using firm size as an instrumental variable for corruption (results not included) and sure enough the data proved that to be the case. One possible explanation for this is that hiding activities (or informal economy) and circumvention of the law are rather results from corruption and they could explain its existence. We ran several models with corruption as a dependent variable to find some interesting results. An earlier study using different sample (Yalamov, 2003b) surprisingly

claimed that members of business associations are significantly ($p=0.029$) more susceptible to corruption if they are asked to pay bribes than non-members, and also less reporting such incidents ($p=0.018$). However, the variable that best explains readiness to pay bribes is the negative experience when a competitor has won a contract through bribes, i.e. cases where rejecting to pay bribe means you are out of business. In cases, where rejecting to pay bribes would mean simply higher transaction costs, companies might have an activist position and try to influence through business associations (even more than one) for better business environment. Based on the main hypothesis of the analysis we estimated a logistic regression of bribery and the number of informal groups and business associations a firm takes part in. Our expectation that the relationship should be negative and significant is confirmed. The results show that as we increase the number of business associations a firm has a membership to, we decrease the likelihood of corruption significantly. For the informal groups the results are inconclusive, which is not illogical considering that more deals happen in the “formal” sector. The results are summarized in Table 5.

Table 5. Logistic Regression Analysis of the Likelihood that a Firm Engages in Corruption.

Dependent Variable (<i>Corruption</i>)	<i>Networks Model</i>	<i>Sector/Size Model</i>	<i>Owner Model</i> ⁷
<i>Number of Business Associations</i>	-.60*** (.23)	--	--
<i>Number of Informal Groups</i>	.39 (.31)	--	--
Sector type:			
<i>Agricultural Firm</i>	--	1.90* (1.0)	--
Owner:			
<i>BG owner</i>	--	--	1.09** (.56)

⁷ The owner model was first estimated with all 5 nationalities represented in the questionnaire, but EU, non-EU, and Russia were automatically discarded by STATA because they predict perfect success or failure.

<i>US owner</i>	--	--	2.44* (1.34)
<i>Constant</i>	-.58 (.13)	-2.81 (1.81)	-1.75*** (.54)
N	325	318	325
<i>Adjusted R²</i>	.02	.03	.02

Note: Unstandardized coefficients are reported. Standard errors are in parenthesis. The significance levels are * when $p < 0.10$, ** when $p < 0.05$, *** when $p < 0.01$. For “sector type” and “firm size” only significant results are presented for the purpose of space.

The second model of corruption is based on the type of sector and size of firm (size is not reported since it is insignificant). What we learn from this model is that agricultural firms are more likely to engage in corrupt activities than other firms. An odds ratio test shows that Agricultural firms have 6.7 times the odds of paying bribes. Finally, an interesting model is the last corruption model. This is a model that tests whether foreign companies are more likely to engage in corrupt activities. An expectation that this is true is derived from the main hypothesis – smaller participation in networks, larger likelihood of offering bribes. Our assumption here is that foreign owned companies have fewer connections and participate in fewer formal and informal networks than local companies. The data output confirms this expectation. Although interesting this result needs further investigation since most of the respondents in the current survey were local companies, and those weren’t (albeit few in number) were most US owned. We need to examine a pool of respondents with larger variation of nationality of the firm in order to confirm the above findings. Another factor worth studying is the ownership structure of foreign companies. Smarzynska and Wei (2000) argue that corruption environment of recipient country influences entry mode for FDIs in such a way that donor countries with stricter rules would enter the host by joint-ventures. Additional problem arises if we try to look for ultimate owners of the foreign companies. In quite many cases locals actually ultimately own FDIs.

6. Conclusions

The paper provides an overview of modes, causes and consequences of non-compliant behavior of Bulgarian firms and discusses two different instruments to achieve specific goals as influencing new legislation, circumvent the laws, hide a portion of firms' activities or obtain public procurement contract. We distinguish between two major ways a firm can go – it could cooperate in production of these ends by utilizing different networks it is part of it, or alternatively it could buy it through a bribe. Although firms can rationally choose to join a network, it is rather an exclusive inherited asset. The paper explores if bribes and networks are substitutes in achieving firms' goals and concludes that bribes are used to facilitate hiding activities and circumvention of the law by the firms, while networks are utilized to shape the legislation and acquire public procurement contracts. Worth noting is the fact the public procurement market is gradually cartelizing, limiting access to contracts only to network members. The paper also argues that experience in state administration and politics significantly explains participation in informal networks, while high-profile experience prior to 1989 and former involvement in sports clubs of firms; owners significantly explains participation in formal business associations.

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