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Transition strategy, corporate exploitation, and state capture: An empirical analysis of the former Soviet states*

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Abstract

It is difficult to find, at a glance, a clear connection between corruption and the reform processes in the states of the former Soviet Union (FSU). The key to untangling this issue is to look at the peculiarities of their transition strategies and economic crisis compared with those of Central and Eastern European countries. This paper aims to unravel the complex ties between the transition process and corruption in the FSU states through theoretical and empirical analyses of the impact of multiple factors. These factors include the extent of decentralization of the government-enterprise relationship and the degree of state intervention in corporate management as well as the impact of economic distress that have been affecting the frequency and degree of corporate exploitation and state capture. In this manner, our study aims to complement earlier achievements in this field.

JEL classification: O17; O57; P37; P51

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1. Introduction

In Central and Eastern Europe (CEE) and the former Soviet Union (FSU), the transition to a market economy resulted in a series of unexpected socio-economic phenomena in the initial stages of their reform processes. One example, in this regard, is the rampant spread of corporate exploitation by state officials and state capture by enterprises triggered by the breakdown of a strong state order that had been recognized as a virtue during the socialist era. Such illicit acts were on a scale that is far beyond anything anyone had ever imagined, drawing a great deal of attention from researchers as a critical social problem facing these nations (Suzuki, 2005).

The harmful nature of collusion and corruption between government and business enterprises is a classic conflict of the political economy, which goes back to Adam Smith's *The Wealth of Nations* (Smith, 1789).¹ Even in the last decade of the 20th Century, this theme was examined theoretically by Laffont and Tirole (1991), Shleifer and Vishny (1993; 1994), Grossman and Helpman (1994), Dixit, Grossman, and Helpman (1997), and others. However, the feasibility of conducting an empirical microeconomic analysis of the economy of a given country or region, socialist countries in particular, has been limited due to the nature of the issue itself. In this context, the *EBRD-World Bank Business Environment and Enterprise Performance Survey* (BEEPS), a large-scale enterprise survey jointly conducted in 1999 by the European Bank for Reconstruction and Development (EBRD) and the World Bank, which covered almost all of the post-communist countries in the CEE and FSU region, was a pivotal project enabling cross-regional analyses of corporate exploitation and state capture in transitional countries, resulting in a number of highly suggestive empirical research achievements, including those by Hellman et al. (2000) and others. The perspectives presented by these pioneering studies regarding the linkage between the reform process and corruption, however, do not necessarily coincide with the reality of the FSU states. In other words, the prediction that corporate exploitation and state capture occur more frequently and at more serious levels in countries with a lesser extent of reform than in more progressive transition countries cannot be completely applicable to the former Soviet countries.

¹ For instance, see his description of the trade to the East Indies in Chapter VII "Of Colonies," Book IV "Of Systems of Political Economy."

As pointed out in another study (Iwasaki, 2004), it is possible to find distinctive characteristics of the reform process in the FSU states that contrast sharply with those in the CEE countries when their transition efforts are assessed from the viewpoint of a reaction pattern to the unprecedented political crisis caused by the collapse of the 70-year-long federal system, which is characterized as a ‘dual system shock.’ Here, we will maintain that the recognition of this historical fact offers the key to finding answers to mysteries that are yet to be solved. Thus, the aim of this paper is to theoretically consider and empirically examine the various causes of corporate exploitation and state capture in the FSU states by shedding light on the specific features of the transition strategies and economic crises of these nations.

This paper is organized as follows: the following section discusses the achievements and remaining issues of earlier studies on corruption in transition countries. The third section examines a variety of factors contributing to corruption in the FSU states from the standpoint of the characteristics of transition processes in these countries. The fourth empirically verifies our assumptions, and, finally, the conclusion summarizes the results and major implications of the findings.

2. Corruption in transition economies: literature review

In the socialist era, bribery was widely practiced as a sort of necessary evil among citizens in the CEE and FSU states. In the Soviet Republics, it functioned as a social mechanism used to overcome obstacles established by rigid bureaucratic systems and chronic supply shortages that could affect business operations and everyday activities. For example, bribery-prone informal transactions between bureaucrats in planning offices and those involved with material-technical supply organs and enterprise managers were inextricably linked to the formal planned economy system. The transactions functioned as a sort of lubricant for alleviating various output difficulties caused by such factors as inconsistency between supply and output plans and incomplete distribution systems.² A good example involves the “*tolkach*” (pusher) as informal supply agent. This individual “nags, begs, borrows, bribes, to

² For a more detailed discussion of this topic, please see pioneering research works on socialist economies, including Granick (1954; 1960), Grossman (1960; 1971), Kornai (1980; 1992), Ericson (1984), Alessandrini and Dallago (1987), and Welfens (1992). Harrison and Kim (2006) is one of the most recent works on this subject.

ensure that the needed supplies actually arrive” (Nove, 1986, pp. 95-96). In other words, although bribery between bureaucrats and enterprise officers under socialism was motivated by the self-interest of the individuals, it was considered to be an institutionalized, socially necessary evil for achieving goals and maintaining the national economy.

In contrast, in the transition period, bribery between bureaucrats and entrepreneurs began to take place more for self-interest rather than as a socially necessary evil in CEE and FSU states. This started to occur against the background of a faltering rule of law and weakened police authority as well as generally poor living conditions. Now, compared to the communist regime, the act of bribing bureaucrats to make them turn a blind eye on illegal conduct or tax evasion or to procure state-owned assets or receive government subsidies or contracts in an illicit way has become more widespread in the transition countries (Feige and Ott, 1999; Whitten, 2002). Therefore, international financial organizations and their economists, as the promoters of the transition to a market economy, may well pay a great deal of attention to these malpractices, which may significantly hamper the effective distribution of income and resources in the context of the national economic systems of these countries, leading to serious damage of the public trust in their reformist governments.

Corporate exploitation, a main theme of this study, is defined as private bride-taking by state officials, as described above. Right after the transition to market economies, the frequency and sphere of corporate exploitation in this sense expanded dramatically, particularly in the FSU countries. In fact, according to Johnson et al. (2002), who surveyed 1,471 enterprises in Poland, Slovakia, Romania, Russia, and the Ukraine in 1997, as many as 90% of the Russian and Ukrainian companies surveyed had made extra payments for public services or the acquisition of a license, while an average of one in four corporations had the same experience in the other three CEE countries. In addition, 76% and 85% of enterprises surveyed in Russia and Ukraine, respectively, had previously been forced to make “unofficial” payments as a result of a tax inspection, compared with an average of 7% for the surveyed corporations in the other three nations. Moreover, according to the INDEM Foundation, a famous anti-corruption think-tank in Moscow, which conducted a sociological questionnaire distributed to 1,000 Russian businessmen in the first half of 2005, the estimated total in bribes they paid to bureaucrats, policemen, and others in one year increased 9.4 times from 33.5 billion U.S. dollars in 2001 to 316 billion

U.S. dollars in 2005. Following the rapid expansion of corruption in the business sector, the estimated average payment for each case of bribery jumped 13.3 times from 10,200 to 135,800 U.S. dollars during the period (INDEM Foundation, 2005).³ This strongly suggests that, even taking into account the dollar-denominated GDP growth during the same period (49.2%),⁴ Russia's "corporate exploitation market" expanded to a great extent. Similar results were also observed in many other studies, such as Frye and Shleifer (1997) and Broadman (2000). It is clear that bribe-taking by bureaucrats from businesses has become more pervasive in the FSU countries.

State capture can be interpreted as a kind of rent-seeking. Fries et al. (2003) define that "state capture refers to the actions of individuals, groups, or firms to influence the formulation of laws, regulations, decrees, and other government policies (that is, the basic rules of the economic "games") to their own advantage through illicit or non-transparent means." Proper petitions and lawful lobbying activities are, therefore, not included in this phenomenon. State capture also occurs more frequently in the FSU than in the CEE countries, as reported in the above-mentioned joint survey by the EBRD and the World Bank. The survey revealed that an average of 22.7% of the total number of enterprises surveyed was "captor firms" in the 13 FSU states, compared with 16.6% in nine CEE nations. The difference in means between the two regions is statistically significant at the 10% level by the one-sided test ($t = 1.40$). Nonetheless, as seen in **Panel (A) of Figure 1**, in this regard, there are considerable differences between individual FSU states, and the proportion both of 'bribe firms' using bribes for state capture and 'influential firms' capturing state but not using bribes for this aim also varies from country to country.⁵

Hence, corporate exploitation and state capture have surfaced as serious social problems in transition countries, especially in the former Soviet states, leading many

³ But the intensity of bribery by business persons itself dropped 20.2 percent in the same period. Moreover, the survey results of 3,000 Russian citizens show that the estimated total bribes paid by Russian people in daily life increased only 9 percent from 2.8 billion in 2001 to 3.0 billion US dollars in 2005 (ibid.).

⁴ Authors' calculation based on IMF, World Economic Outlook Database: April 2007 Edition (<http://www.imf.org/external/pubs/ft/weo/2007/01/data/index.aspx>).

⁵ This classification is based on the notion that state capture is not limited to illicit acts related to bribery, although research groups of the EBRD and the World Bank define a 'captor firm' as an enterprise that extends its influence over the government using bribes and an 'influential firm' as one that has political clout even without the payment of bribes.

researchers to seek to unveil the reality of the circumstances of these two processes. In particular, much of their attention has been directed to Russia, a corruption- and fraud-riddled nation where a handful of big capitalists (oligarchs) overtly intervene in political affairs. The other reason that many researchers are interested in the corruption problems in Russia is the diversity of local situations. The Russian federation consists of 89 autonomous republics and regions (*oblast'*) with different governing mechanisms. They range in terms of the scope of the local governor's authority to the relationship between the regional government and the federal government as well as between the former and judicial organizations, thus providing researchers with ideal material for an analysis of the impact of diverse political arrangements on corruption by bureaucrats and firms.

Russian regional leaders and local bureaucrats are notorious corporate exploiters. According to an enterprise survey carried out by the National Bureau of Economic Research in the fall of 2002, most of the corporate managers surveyed responded that the primary enemies threatening their property rights were not their competitors or business partners but the local governments. In the survey, they reported that the arrogant, freewheeling attitude of local officials is mostly attributable to the dysfunctional federal government. These findings suggest that corporate managers strongly mistrust in the ability of the federal government to handle regional affairs and in the fairness and the law enforcement of the arbitration courts responsible for the resolution of disputes between firms and local governments (Golikova et al., 2003; Simachev, 2004).

State capture by enterprises is also widespread in Russia. According to Frye (2002a), large-scale captor firms in the financial sector operating as members of business groups are, in particular, effectively exercising their power to influence the passage of laws and ordinances. In addition, there are empirical studies, such as those of Yakovlev and Zhuravskaya (2004) and Zhuravskaya and Sonin (2004), suggesting that the business groups organized at the federal level, that is, newly emergent industrial syndicates led by oligarchies, are winning favorable treatment from regional governments in a successful way, which, at the same time, is adversely influencing the business activities of other corporations in each region as a side effect.⁶

⁶ In recent years, however, the rent-seeking power of local bureaucrats and oligarchs has been declining due to the introduction of the direct appointment system for the heads of regional governments by the Federal President, a series of fierce political attacks on

A series of BEEPS-based empirical studies also confirms that, as in the case of Russia, the size of enterprises has a significant impact on the probability of state capture and state capture produces negative external effects on enterprises other than the captor firms themselves. Moreover, these pioneering research studies present the following noteworthy findings: (a) the possibility that an enterprise encountering one-sided exploitation by state officials is negatively correlated with its size; (b) privatized firms and *de novo* companies pay bribes to bureaucrats more often than state enterprises; (c) foreign-affiliated joint ventures capture the state more successfully than domestic corporations, while, on the other hand, the subsidiaries of Western multinationals are generally reluctant to become involved in state capture; (d) enterprises with a high level of government participation are more likely to become influential firms; (e) captor firms show better performance than non-captor firms in terms of sales and investment rates, and the gap between the two is more substantial in countries with a higher degree of state capture (Hellman et al., 2000, 2002, 2003; Hellman and Schankerman, 2000; Fries et al., 2003). Furthermore, according to Jensen (2002) in his advanced study based on BEEPS, state capture has the potential effect of reducing foreign direct investment (FDI) in a given country. He found that the share of FDI in the GDP for the country with the greatest degree of state capture among the 18 surveyed nations was 1.7% lower than that for the country with the lowest degree, and this effect is statistically significant at the 5 percent level.

The above policy implications based on BEEPS are interesting and persuasive and generally conform to the situation in the FSU states without having to make specific assumptions. It can be said that the progress of economic reform is negatively associated with the frequency and the degree of state capture in the CEE countries. However, as illustrated in **panel (A) of Figure 1**, it is uncertain whether this proposition can be applied to the FSU countries as well. Besides, as shown in **panel (B) of Figure 1**, there is no noticeable correspondence between the reform progress and the proportion of so-called ‘squeezed firms,’ i.e., enterprises that have no voice in the policy-making process despite the demands for bribes that they receive from state officials in terms of the legislation of laws and ordinances. As to why this is the case, the answer can be found in the peculiar nature of transition

oligarchs launched by the Putin administration, and the re-tightening of state control over major industries including the energy sector. We thank one of our referees for sharpening our discussion on this point.

strategies and economic crises in the FSU countries compared to those in CEE countries. From this standpoint, the next section examines the various factors leading to serious corruption in the FSU states.

3. Reform processes and corruption in the former Soviet states

To answer the questions in the section above requires an understanding that the systemic transformation in the FSU was triggered by the breakdown of a 70-year-old federal system and analyzing the two following points.

First, not all of the transition strategies adopted by the FSU states were designed with the aim of decentralizing economic systems. As a form of political reaction to the collapse of the Soviet Union, some FSU states introduced transition processes that were potentially incompatible with the promotion market economies.

On the level of federal republics, the collapse of the Soviet Union brought about a “dual system shock”. In another study (Iwasaki, 2004), the point was explained as follows:

“It is unnecessary to emphasize that FSU countries only played a role as “sub-systems” in the unified and highly centralized economy of the Soviet Union. Not surprisingly, in comparison to other COMECON members, the economic system in these countries was much less consummate in terms of systemic independency. In addition, in the Soviet Union, central administration organizations, represented by the all-union ministries and the union-republican ministries, were widely instituted in the industrial sector. Such organizations imposed their authority over major enterprises and factories in each state directly and exclusively. In other words, in each state of the FSU, a production system was widely operational, even beyond the control of the highest decision-making authority of a given state and its council of ministers (**Figure 2**).

Facts relative to this issue are shown in **Table 1**. In 1989, industries under federal jurisdiction (IFJ) produced 61.4% of the gross industrial output of the entire Soviet Union. Similarly, the shares of labor and fixed capital committed to the same sector were at extremely high levels: 64.2% and 81.1%, respectively. This is to say, the IFJ overwhelmed the Soviet industry. Thus, when attention is turned to the states, it can be seen that the weight of the IFJ on output varied from 69.0% in Russia to 28.4% in Moldova. However, when fixed capital is set as a standard, in most of the republics, the weight of the IFJ goes far beyond 50%, with Russia leading at 86.8%. This clarifies the IFJ’s central role in capital-intensive heavy industries in every republic. In addition, the same table suggests that the states’ economies were extremely dependent on foreign trade. Moreover, exports and imports within the Soviet Union represented an overwhelming part of trade activities of the states. As it is widely known, intermediate goods formed the bulk

of regional trade in the Soviet Union, and this kind of trade was handled mainly by interconnected state-owned enterprises. Because of this establishment, the collapse of the Soviet Union brought about a twofold systemic crisis. On the one hand, there was a partial or total loss of the superior decision-making organs of enterprises at the center of production activities, and, on the other hand, the interruption of trade relationships and industrial activities spread from organizations of central authority in all directions. There has never been another example of transformation on such a grand scale as that of the states of the FSU moving out of an enormously defective economic system.” (op cit. pp. 227-228)

In other words, the FSU states entered the transition stage with their economic systems still crippled by a very large, abruptly generated “institutional vacuum” in their own domestic economic systems. This served as a critically unique precondition for the advancement of reforms in the FSU states in comparison to the CEE countries, which barely maintained their systemic independency.

Under these circumstances, some FSU countries tried to fill this institutional vacuum by radically devolving power to domestic firms, including former federally owned enterprises. At the same time, some states made an effort to restore the autonomy of their economic systems through the centralization of the control and supervision authority over domestic firms in the hands of newly born independent governments and the restructuring of industrial organizations. The former can be termed a ‘decentralization strategy,’ whereas the latter can be called a ‘recentralization strategy.’ If the decentralization strategy was similar to the reform package advocated by the IMF and the World Bank, the ultimate goal of the latter was to establish a centralized and vertical chain of command over business entities to be dictated by a central government with strong economic power as the pillar of a new economic system. The system which would take over from the planned economy allows for a certain level of liberalization in areas such as price formulation, business transactions, and labor contracts. The main policy tools put into operation to achieve this goal included: (a) the continuation of price control over energy and other major products; (b) the maintenance of a state order system and a centralized trade regime for major exports; (c) the continued monopolization of key industries by the state and the concentration of the shares of private companies in the hands of government-ruled financial institutions and commercial organizations; and (d) the introduction of a multiple exchange rate system and the imposition of surrender requirements for export earnings. There is no need to emphasize that these

economic policies have been repeatedly criticized by international financial institutions.

In the early 1990s, several FSU states upheld a recentralization strategy as a political stance of their leaders or as a result of the need to consolidate wartime governance. Each case is not discussed here, but such countries included Azerbaijan, Belarus, Tajikistan, Turkmenistan, and Uzbekistan. Afterwards, however, and as they went through substantial political and economic changes, Azerbaijan and Tajikistan made a gradual shift in their reform policies to policies based on a decentralized strategy. As a result, there are now three countries that have continued to maintain a centralized economic system since 1999, when the BEEPS survey was conducted. In these countries the final decision-making concerning the strategic management issues of major enterprises is made by the government leader or the head of an administrative organ, or a state syndicate appointed by the government. Hence, the government constantly monitors the activities of individual corporations and intervenes as necessary. As described in Iwasaki (2004), hereafter, a nation with this type of institutional allocation is called an 'Order State.'

This relationship between government and enterprises in such countries brings back images from the socialist era. Both of them share similar interests. They are strongly motivated by the political purposes of working closely to maintain control over the distribution of state wealth and authority. Corporate managers in these countries aspire to political power after serving as CEOs. Being a top manager is not a final goal in their career system. The governments systematically send out their young bureaucrats into enterprises under control to provide them with an opportunity to build up "proper experience." The close personnel network between governments and enterprises makes it possible to discuss and coordinate various managerial issues in formal political settings, including those issues that would be criticized as being collusive or improper interlocking between political and business circles in Western countries. Therefore, it would be unreasonable to label these countries with such a government-business relationship as countries in transition to market economies. Opposite to CEE countries, which are devoting great policy efforts to promote the systemic transformation to market economies, the existence of these countries highlights the distinct nature of the transition countries of the former Soviet Union.

In contrast, other countries with a decentralization strategy substantially pushed the transfer of the decision-making authority in corporate management from the government to enterprises. In these nations, unlike in the Order States, public

authorities did not conduct systemic monitoring or intervention. However, government responses to any management crisis are divided into two different modes. The first one is to strictly deal with a company in danger in accordance with domestic laws, including bankruptcy laws. A nation that seeks to react in such a way can be termed a ‘Punish State,’ where enterprises are characteristically assured of almost complete independence from the government in terms of ownership and management. The Baltic states of 1999 belong to this category. The other mode, which is often observed in countries lagging behind in their economic reforms and with incomplete separation between the government and enterprises, is to rescue a corporation by temporarily depriving it of decision-making authority and then injecting public capital into it and reshuffling its executive officers. A nation with such an institutional setting is called a ‘Rescue State.’ The remaining nine FSU states, including Russia, come under this category.

In consequence, the 15 FSU states are classified into one of these three categories from the viewpoints of the basic direction of the transition strategies and institutional allocation forming the government-business relationship. This perspective is also in agreement with evaluations by other researchers regarding the reform process and state system in each of these nations. Specifically, the structures of the three clusters formed on the basis of our hierarchical cluster analysis, in which a total of 14 variables were used to represent government-business relationships as of 1999, were in perfect accord with those of the above-mentioned state models.⁷ For greater clarification of the relative positions of individual countries, the principal components of these variables were extracted. The results are shown in **Table 2**. Judging from its eigenvector and component loadings, the first principal component, which explains 68.5% of the 14 variables’ combined variance, can be regarded as a comprehensive index for the extent of decentralization (or centralization) of economic power in each country. **Figure 3** summarizes the above considerations. The figures in parenthesis, which indicate the component scores for individual countries, will be used in the empirical analyses in the next section.

The second point to note regarding the collapse of the Soviet Union is the enormous impact of the economic distress that hit the region. The real GDP of the 15 FSU states for 1999 saw an average decline of 34.0% compared with the 1991

⁷ Here, the Ward method based on the Euclidian distance was chosen to integrate the clusters.

level and was 19.1% lower than that of the 10 CEE countries 9 years after the start of their transition.⁸ There is no doubt that this destructive drop in production level resulted from a combination of the ‘transformational recession’ (Kornai, 1994) accompanied by the marketization process itself and the aforementioned ‘dual system shock.’ However, it is also true that different transition strategies led to a certain degree of variation in their effects. Government-led crisis-management measures based on a recentralization strategy, in particular, produced positive results. In fact, Iwasaki (2004) confirmed that the institutional settings typical of Order States, on average, underpinned an annual GDP and industrial production growth of 2.7% and 7.0%, respectively, from 1992 to 2001.⁹ Consequently, according to the World Bank’s official statistics on the real GDP growth rate in the FSU countries, the production level for the three countries categorized as Order States in 1999 was 86.6% of that in the last Soviet era – 25.6% higher than the 61.0% for the other twelve countries.¹⁰ This gap can never be so small that it can be overlooked as long as the confusion and poverty experienced by a society as a result of an economic distress provide a breeding ground for corruption.

Based on the above discussion, the following three hypotheses can be derived concerning the correlation between the reform process and corruption in the FSU states.

First, under the same conditions, corporate exploitation and state capture occur more frequently in nations with an institutional setting that has the character of a Rescue State. That is, in a Punish State with a clear separation between the government and business firms, the authority of the government, the parliament, and state officials, which may serve as the root of corruption, is relatively limited. In addition, in an Order State, where the concentration of the decision-making authority

⁸ The real GDP of the CEE countries declined by an average of 14.9% between 1989 and 1997.

⁹ See *Table VII* in Iwasaki (2004, p. 245).

¹⁰ For reference, in 1999, the average production level of the three Baltic nations categorized as Punish States and that of the other nine FSU states, including Russia, which belong to the Rescue States, were 77.0% and 55.5%, respectively, of the levels in the late Soviet period. When official statistics published by FSU states are used, the gap in living standards among these individual countries is wider by several percentage points. As pointed out by international financial institutions, it is highly possible that this bias is due to statistical shortcomings or artificial data manipulations. Therefore, we use estimates by the World Bank to investigate this issue in this and the next sections.

in state leaders and the interest-coordination mechanism of corporate affairs between the government and firms are formally institutionalized, there is only a slim chance of corporate exploitation being privately committed by bureaucrats as well as of intervention in the government policy-making process by corporate managers. Accordingly, *in the context of the particularity of the transition strategies adopted by the FSU states, the extent of decentralization / centralization of the government-business relationship is nonlinearly correlated with corruption* (Hypothesis 1).¹¹

Secondly, there is a kind of ‘exchange’ relationship between government intervention in corporate management and state capture.¹² Government intervention in managerial affairs not only gives state officials a chance to exploit the enterprise but also leads to the possibility of the enterprise obtaining a certain influence in the policy-making process in exchange for its acceptance of such public intrusion. In this view, it is presumed that *corruption is positively correlated with the level of government intervention in corporate management* (Hypothesis 2). On the other hand, with regard to the formulation of this hypothesis, the degree of government intervention would be the highest in Order States, followed by Rescue States and then Punish States. Hence, it is not denied that the corruption deterrent effect of the institutional allocation typical of Order States, as implied by Hypothesis 1, may be offset to some extent by its corruption induction effect.

Thirdly, *ceteris paribus*, economic distress accelerates corporate exploitation and state capture along with the relaxation of the national order, a wide drop in the wages for public servants as a result of rapid price increases and budget deficits, deterioration of the business environment, and other problems. Therefore, the general perception is that *the impact of economic distress is positively correlated with corruption* (Hypothesis 3).¹³

¹¹ Consistent with our discussion, Hellman et al. (2003) also recognize the possible non-linearity between the progress of structural reform and state capture. They state that “the low capture index for some of the least advanced reformers, such as Belarus and Uzbekistan, might appear puzzling. However, in these countries the private sector remains small, important elements of the command system are still in operation and the political regime are highly authoritarian. In countries with such a severe imbalance between the power of the state and the private sector, the extent of state capture by the private sector can only be minimal (p. 758).”

¹² Frye (2002) also presents a view that regards corruption as an act of exchange between bureaucrats and corporate managers.

¹³ This hypothesis is supported by empirical evidence on the relationship between economic growth and corruption from many earlier studies, including Knack and

In this way, corporate exploitation and state capture in the former Soviet region are determined by multiple factors that are, in part, nonlinearly correlated with each other. This may be the main reason that no clear linkage has been found between the reform process and corruption in this region. Therefore, a more rigorous methodology should be used to verify the impact of the three factors – the extent of decentralization / centralization of the government-business relationship, the degree of government intervention in corporate management, and the scale of economic crises – that affect corruption in individual nations. Having clarified the assumptions, we will now proceed to their empirical verification.

4. Empirical analysis

As reported above, BEEPS was a large-scale questionnaire conducted from June to August 1999 that targeted corporate directors and owners of 3,626 enterprises in 22 CEE countries.¹⁴ The details are not reported here, but the questionnaire used included, in addition to various questions about the business environment surrounding the surveyed firms in the transition countries, numerous well-thought-out items regarding government intervention in corporate management, bribery practices targeted at government officials, and lobbying activities, either carried out directly or by industrial groups in an attempt to reveal the reality of state capture.¹⁵ This section purports to validate the hypotheses raised in the previous section using the responses from 2,276 enterprises in 13 FSU states surveyed in the BEEPS.¹⁶ The first part of this section is an investigation of the government intervention in business activities, and the remaining part is an analysis of the determinants of corporate exploitation and state capture.

4.1. Government intervention in corporate management

Figure 4 and **panel (A) of Table 3** show the relationships of the degrees of government intervention in corporate management, the extent of decentralization /

Keefer (1995), Mauro (1995), Hall and Jones (1999), and Wyatt (2003).

¹⁴ See ACNielsen (1999) and Hellman et al. (2003) for more details.

¹⁵ The actual questionnaire and the survey results are available at the EBRD website (<http://www.ebrd.com/pubs/econo/beeps.htm>).

¹⁶ The average number of surveyed companies per nation is 175. The median is 132. Of 13 states, Russia had the largest number with 552 companies, while Lithuania had the smallest number with 112 firms. Tajikistan and Turkmenistan were not subjects of the survey.

centralization of the government-business relationship, and the state type on the basis of descriptive statistics and analysis of variance (ANOVA). The degree of government intervention, as referred to herein, is represented as the mean of ratings on a 6-point scale (0 = “never” to 5 = “always”) marked by the surveyed firms with regard to the frequency of state intervention related to the three areas of investment strategies, sales activities, and pricing policies. The horizontal axis of **Figure 4** is the scale of the component scores of the individual FSU states. This figure shows the negative (positive) correlations between the extent of decentralization (centralization) of government-business relationships and the degree of intervention in corporate management. The results are the same even when the samples are classified by type of ownership. Based on these results, it is evident that, in countries with a higher degree of centralization (such as Belarus and Uzbekistan), government intervention is relatively more active, not only for enterprises with state ownership but also for private firms.

Panel (A) of Table 3 is an illustration of the connections between government intervention and state type. The results of the one-way ANOVA or the nonparametric Kruskal-Wallis test, which is introduced to analyze data when the normality of a given population is rejected by the Bartlett test, allowed us to confirm statistically significant differences in the degree of intervention between state types, except in the case of state-owned enterprises. The multiple-comparison tests revealed that such differences were also significant among all three state types in the case of the “all enterprises” categorization. Furthermore, according to the type of corporate ownership, significant differences were observed between Order States and Punish States in the case of mixed-ownership enterprises. In addition, there was a statistically significant gap between Order States and Rescue States and between Order States and Punish States in the case of private firms.

The above findings are supported by regression analyses (**Table 4**). Models (A) and (B) adapt the probability and the degree of government intervention in corporate management as dependent variables (PINV and FINV, respectively) and the company size (SIZE), ownership type (SOE, MIX), type of foreign investment (FDI, MNC), extent of the decentralization / centralization of the relationship between the state and business sector - the government-business relationship scores (GBS), and industrial dummy as common independent variables. The estimation results of these two models revealed that the greater the extent of centralization of

the government-business relationship, the more probable and frequent the government intervention in management in the country.

Nonetheless, the reliability of Model (B) is largely dependent upon the strict assumption that the coefficients for the explanatory variables of decision-making concerning whether to intervene are the same as those for the explanatory variables of the frequency of intervention. However, the null hypothesis that the parameters are common for both the probit and the truncated parts of the tobit estimation was rejected at the 1 percent level by the Cragg test. Therefore, the models were re-estimated using Heckman's two-step estimator, and it was confirmed that the signs of the individual coefficients for Model (C) correspond to those for Models (A) and (B). Hence, it seems reasonable to conclude that larger enterprises with a greater share of state ownership and a greater extent of the centralization of the government-business relationship are more susceptible to government intervention at a more frequent rate.

4.2. Corporate exploitation and state capture

With the above discussion in mind, the focus now turns to analyzing the determinants of corporate exploitation and state capture. The plot diagrams in **Figure 4** indicate the corruption level defined as the proportion of squeezed firms or captor firms in the total number of surveyed enterprises (the vertical axis), the extent of decentralization / centralization of the government-business relationships, the proportion of corporations that experienced government intervention in the total number of enterprises surveyed, and the real GDP level in 1999 relative to 1991 (=100) as a proxy for the degree of economic crises (the horizontal axis). As we argued in Section 3, this figure indicates a nonlinear relationship between the corruption level and the extent of decentralization / centralization and also presents a positive correlation between the corruption level and the degree of state intervention as well as between the former and the impact of economic crises. However, it is not entirely certain whether the above connections can be established in any particular case since the plot data for several countries, such as Azerbaijan, deviate from the approximation lines.

Panels (B) and (C) of Table 3 show the results from ANOVA of the frequency of bribe payments aimed at state capture and the influence of captor firms on the decision-making process according to the state type. The frequency of bribe payments aimed at state capture as referred to herein is represented as the weighted

mean of ratings on a 6-point scale (0 = “never” to 5 = “always”) with regard to the frequency of bribe-giving for the purpose of exercising influence in the enforcement of laws, ordinances, and other regulatory measures, and the degree of state capture is defined as the weighted mean of ratings on a 5-point scale (0 = “never influential” to 4 = “very influential”) concerning the strength of the influence of captor firms over state executives, legislative organs, ministries, and regulatory agencies.¹⁷ As for the frequency of bribes, significant differences were observed between Order States and the other types of states in the categories of “all enterprises” and “private enterprises,” and, regarding the influence of captor firms, significant differences were detected between Rescue States and the other types of countries in all categories except for “state-owned enterprises.” However, the latter result, which implies that captor firms are more influential in Punish States than in Rescue States, contradicted our expectations. In this respect, these results do not positively support the discussion in the previous section, as is the case with **Figure 5**.

As already mentioned, the above results are attributable to the fact that the corrupt activities in the former Soviet states are simultaneously determined by multiple factors, some of which may have a nonlinear relationship. In order to sort out the interrelationships among these factors, regression analyses were conducted by taking the possibility for enterprises to assume the attributes of squeezed firms, bribe firms, or influential firms and the influence of captor firms in the policy-making process as the dependent variables.

To test impacts of the government-business relationship under the different transition strategies on the corrupt activities, our independent variables include an interaction term between the government-business relationship scores (GBS) and a dummy variable that equals one if the firm was running in a country that adapted the decentralization strategy (DCS), and an interaction term between GBS and a dummy variable of a country that adapted the recentralization strategy (RCS) with proxies for the company size (SIZE), ownership type (SOE, MIX), type of foreign investment (FDI, MNC) used for the regression analyses mentioned in Subsection 4.1. By definition, DCS indicates both of Punish States and Rescue States, and RCS – Order States. In accordance with Hypothesis 1, we predict that the former

¹⁷ Index scores weighted from 4 to 1 according to the influence on state executives, legislative organs, ministries, and regulation agencies were utilized as the proxy variables for the strength of the power of the individual surveyed firms.

interaction term (GBS×DCS) takes a positive sign and the latter (GBS×RCS) takes a negative sign.

Furthermore, to validate Hypotheses 2 and 3, degree of government intervention in corporate management (FINV) and the real GDP level in the survey year relative to 1991 (GDP99) used in **Figure 5** were introduced as additional independent variables. The other newly adopted independent variable was the natural logarithm of the total population in 1999 (LPOP99) as a proxy for the country size in order to control the possibility of physical contact between central government officials and corporate managers.¹⁸

The estimation results are shown in **Table 5**. Models (A) to (C) are the probit estimates by taking the attribute of each sample as the dependent variable (PSQE, PBRI, and PINF). Model (D) is the results of multinomial logit estimation. In Model (D), there are four outcomes. The reference group is the group of enterprises involved in neither corporate exploitation nor state capture ($j=0$); the second group is squeezed firms ($j=1$); the third group is bribe firms ($j=2$); and the final group consists of influential firms ($j=3$). The general expression for a four category multinomial logit regression is:

$$\text{Prob}(Y_i = j) = \frac{e^{\beta_j x_i}}{\sum_{k=0}^3 e^{\beta_k x_i}}, j = 0, 1, \dots, 3$$

where x is a vector of independent variables including a constant term, β is a parameter vector. This gives the probability that the i th firm will belong to a particular outcome, j .

Based on these results, the following four points can be made concerning the three hypotheses raised in the previous section. First, that the interaction term between GBS and DCS is positive and statistically significant, and, in contrast, the interaction term between GBS and RCS is negative and significant both in Models (A) and (D) that take PSQE – probability of enterprises becoming squeezed firms – as the dependent variable strongly suggest a nonlinear correlation between corporate exploitation and the government-business relationship, as expected in Hypothesis 1. This result was also reinforced by additional estimations by introducing the Order State dummy and the Punish State dummy into the set of independent variables

¹⁸ In large countries, such as Russia, there is less chance of contact between state officials and local corporate managers than there is in small nations. Thus, the coefficient for LPOP99 is expected to be negative.

instead of the above two interaction terms since both of these two state dummies were significantly negative.

Secondly, that the interaction term $GBS \times RCS$ is estimated to be negative in Models (B), (C) and (D) that take either PBRI or PINF - probability of enterprises becoming bribe firms or influential firms - as the dependent variable implies that the greater extent of centralization, the fewer captor firms appear in Order States. It is really true for influential firms. At the same time, however, the estimation results of these models also suggest that the probability of the emergence of captor firms in the most decentralized countries – Punish States – is not always lower than that in Rescue States because the interaction term $GBS \times DCS$ has a negative sign with statistical significance at the 1% level. Hence, Hypothesis 1 is only partly supported. The same conclusion was also reached through an estimation using state dummies, in which it turned out that the Order State dummy was significantly negative, whereas the Punish State dummy was negative but not significant.

Thirdly, the fact that FINV is statistically significant and positive in all cases strongly suggests that government intervention in management may be a critical factor in inducing both corporate exploitation and state capture, thereby also validating Hypothesis 2.¹⁹ Lastly, the fact that GDP99 is significantly negative in all models (except for Model (A)) that take either PBRI or PINF as the dependent variables backs up Hypothesis 3 that a serious economic distress may provide a breeding ground for corruption.

Models (E) to (G) are the ordered probit or the tobit estimates, for which the dependent variables are the frequency of bribe payments by squeezed firms (DSQE) and the degree of state capture by bribe firms and influential firms (DBRI, DINF). The results of these estimations also have the same implications as those derived from Models (A) to (D) using the attributes of each sample as the explained variable. With regard to Models (F) and (G), however, the null hypothesis that the coefficients for the probability of state capture are the same as those for the degree of state capture was rejected at the 1% level by the Cragg test. Thus, we re-estimated these two models using Heckman's two-step estimator and represented the results as Models (H) and (I), respectively. It was found that the statistical significance of FINV, SIZE, GDP99, and the interaction terms $GBS \times DCS$ and $GBS \times RCS$ decreased

¹⁹ We conducted the same estimation using PINV instead of FINV and found that the variable was also significant and positive.

substantially in both models. One of the possible interpretations of these results is that the probability of an enterprise exercising its influence on the state's decision-making process is largely dependent upon such factors as its manager's own ability and his/her own human network rather than upon any attribute of the given enterprise. That is, even in the FSU states, which are sometimes ridiculed as a "corruption paradise," bribing high-ranking officials with the aim of gaining more influence over the government is an extremely risky task that requires special skill.

4.3. Robustness check

The estimation results from regression analyses mentioned in Subsections 4.1 and 4.2 were almost the same as those obtained from other alternative estimations, namely, the logit model, the ordered logit model, and the Heckman's maximum likelihood estimator. In addition, the null hypothesis that all the coefficients, except for those of the constant terms, are zero was rejected at the 1% level by the F test, the likelihood-ratio test, and the Lagrange-multiplier test for applicable models.

Furthermore, as we confirmed in Subsection 4.1, both SOE and MIX are very significant and strong explanatory variables of FINV. Therefore, regression models that adapt these variables all together as dependent variables may cause multicollinearity. To check this possibility, we re-estimated FINV by excluding SOE and MIX from the independent variables of each model, and we did the same for SOE and MIX. Our results indicated that the coefficients and statistical significances of these variables are mostly the same as those in Table 5 (**Appendix B**). This fact supports our discussion that government intervention in corporate management may directly trigger both corporate exploitation and state capture in the FSU states.

5. Concluding remarks

The results of the empirical analyses in the previous section on the whole positively support our hypotheses presented in Section 3. That is, corporate exploitation is nonlinearly correlated with the extent of decentralization / centralization of the government-business relationship, and its probability and frequency of exploitation by officials become relatively high under an institutional setting typical of a Rescue State. Moreover, state intervention in corporate management strongly inspires corruption, and, possibly, there is a kind of exchange going on between government intervention in corporate management and state capture by enterprises. In addition,

an economic distress provides a breeding ground for corruption because it accelerates both of corporate exploitation by bureaucrats and bribe payments by corporate managers. On the other hand, there was no substantial contradiction between the policy implications given by earlier studies, such as those by Hellman and Schankerman (2000), and the empirical results in this paper.

The previous section, however, provided only partial evidence to support our hypotheses concerning the association between the extent of centralization of the government-business relationship and state capture, implying the possibility that close and opaque ties between the central government and a handful of influential corporations had not been completely wiped out as of 1999 even in the Baltic states, dubbed as front-runners among the FSU nations regarding the progress of reforms.

In contrast, clear-cut reasons were presented in this paper to explain why state capture is less active in less-reformed countries, such as Belarus and Uzbekistan, than it is in other FSU states, including Russia. In the above two nations, which succeeded in filling the institutional vacuum in their economic systems resulting from the collapse of the Soviet Union, the government has firmly maintained a dominant position over domestic firms, strictly narrowing down the probability and scope of state capture by enterprises. Furthermore, the decline in production in the beginning of the transition was relatively mild owing to the flexible crisis-management measures taken under Order State-like institutional allocations. The empirical analyses presented in this paper clearly confirm that the effective prevention of economic crises contributed significantly to the containment of corruption. It is presumed that, in Belarus and Uzbekistan, these two factors produced favorable results, which compensated well for the corruption-inducing effect of the comparatively aggressive government intervention in corporate management.

In 1999, the year that the BEEPS was conducted, economic reforms were insufficient, and the separation between the government and the business sector was incomplete in almost all of the FSU states. Under these conditions, serious economic crises resulted in corporate exploitation and state capture, which greatly hampered the efficiency of resource allocation at the national economic level in these countries. Moreover, graft problems were so deep-rooted in the societies of these countries that honest businesses and citizens have probably been deprived of real as well as potential opportunities to contribute to the country's economic recovery and growth. In fact, according to an estimate by PricewaterhouseCoopers,

if corruption by government officials and business leaders were eliminated in Russia, foreign investment in this country would increase by 10 billion U.S. dollars from the current level (Judge and Naoumova, 2004).

From the discussion above, we conclude that it was the failure in the affirmative promotion of structural reforms, the severance of the paternalistic government-business relationships, and the control of economic crises that caused widespread corruption by self-interested bureaucrats and entrepreneurs in some of the former Soviet states and deprived their people of the positive outcomes that would have been realized through transition. In this sense, the government is a crucial determinant of the grounds for corruption (Budak and Goel, 2004). The role of the government in the first stage of transition was of extreme importance.

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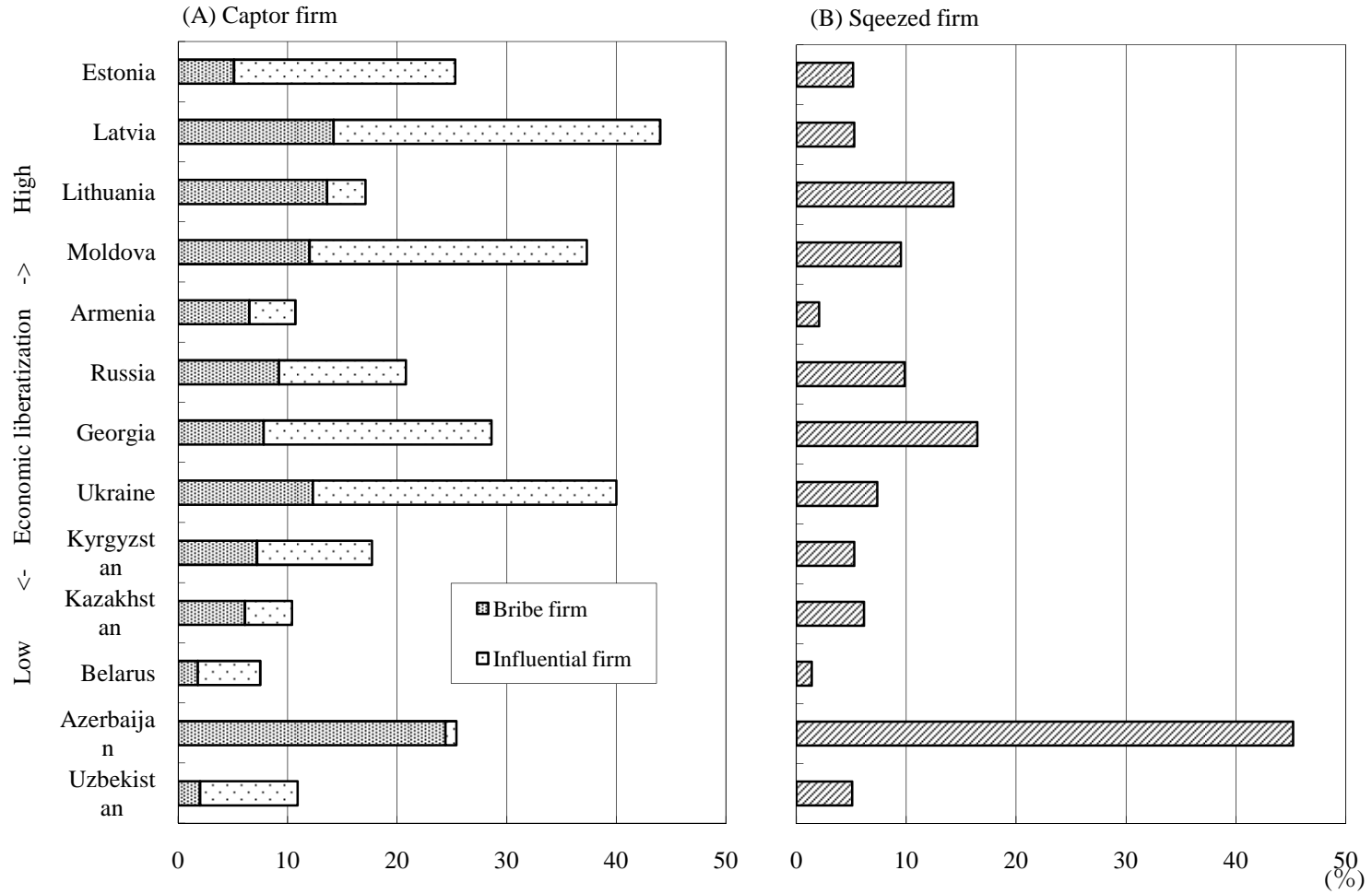
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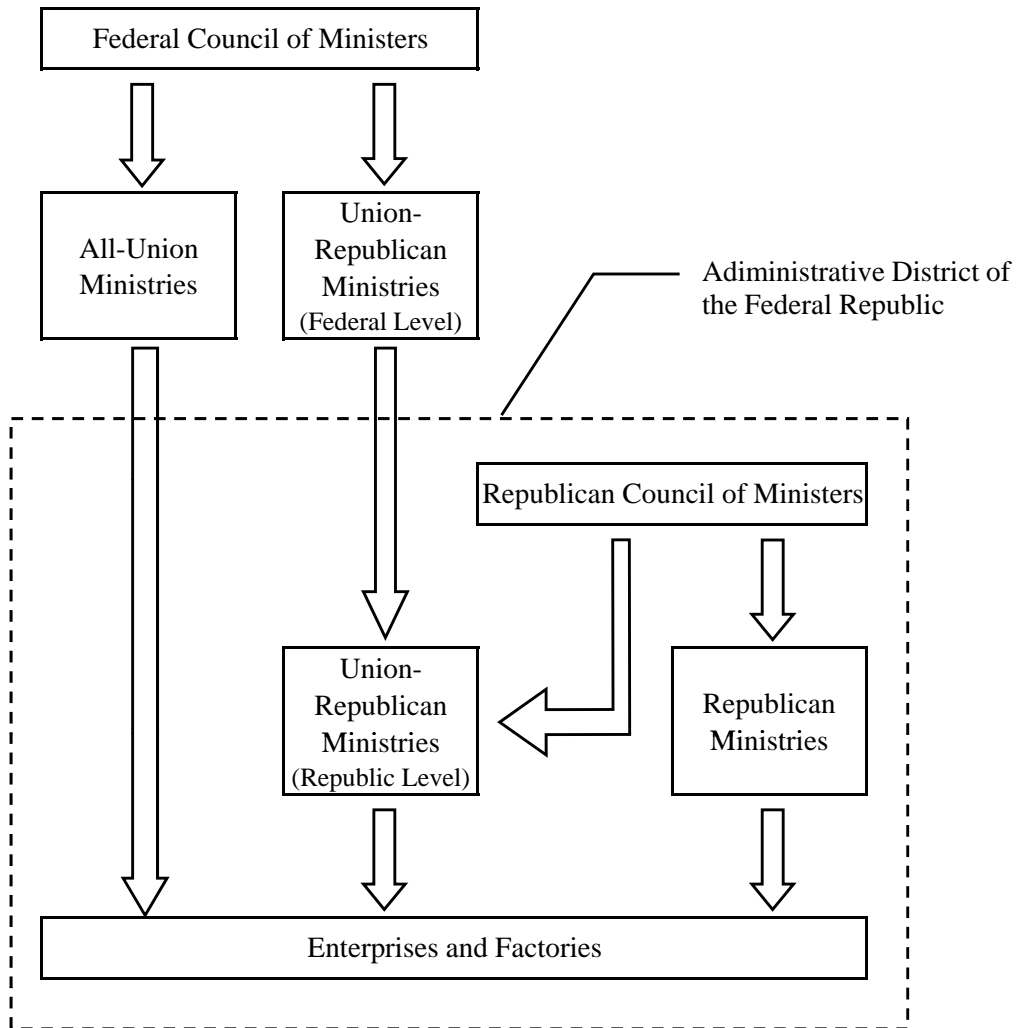
Figure 1. Proportion of captor firms and squeezed firms in the total number of surveyed companies by country



Source : (a) Hellman et al. (2003), Table 3, (b) Author's estimation based on BEEPS.

Note : The order of FSU states by degree of economic liberalization is based on estimations by Freedom House.

Figure 2. Industrial management system of the USSR in the Late 1980's



Source : Iwasaki (2004), p. 228.

Note : The arrows indicate the flow of administration commands, including production norms.

Table 1. Integration of the federal republics to the Soviet Economy

(%)

	(a) Weight of Industries under a Federal Jurisdiction (1989)			(b) Degree of Trade Dependency (1990)		
	Total Output	Amount of Labor	Fixed Capital	% of Whole Trade to GNP	% of Regional Trade to GNP	Share of Regional Trade
USSR	61.4	64.2	81.1	¹⁾ 23.2	¹⁾ 17.0	73.9
Armenia	50.8	54.3	71.9	28.4	25.6	90.1
Azerbaijan	46.7	50.6	81.4	33.9	29.8	87.7
Belarus	53.5	53.7	74.4	47.3	41.0	86.8
Estonia	28.5	34.2	59.0	32.9	30.2	91.6
Georgia	31.4	41.9	65.9	28.9	24.8	85.9
Kazakhstan	49.5	50.7	67.0	23.5	20.8	88.7
Kyrgyzstan	33.0	45.9	69.0	32.3	27.7	85.7
Latvia	38.7	44.9	62.2	41.4	36.7	88.6
Lithuania	39.2	41.7	66.1	45.5	40.9	89.7
Moldova	28.4	35.6	48.2	33.0	28.9	87.7
Russia	69.0	70.7	86.8	18.3	11.1	60.6
Tajikistan	28.9	32.1	72.4	35.9	31.0	86.5
Turkmenistan	37.0	30.5	83.0	35.6	33.0	92.5
Ukraine	58.0	63.1	72.8	29.0	23.8	82.1
Uzbekistan	34.8	35.5	66.1	28.5	25.5	89.4

Source : Goskomstat SSSR (1990), p. 331; Michalopoulos and Tarr (1994), pp. 4-5, p. 15.

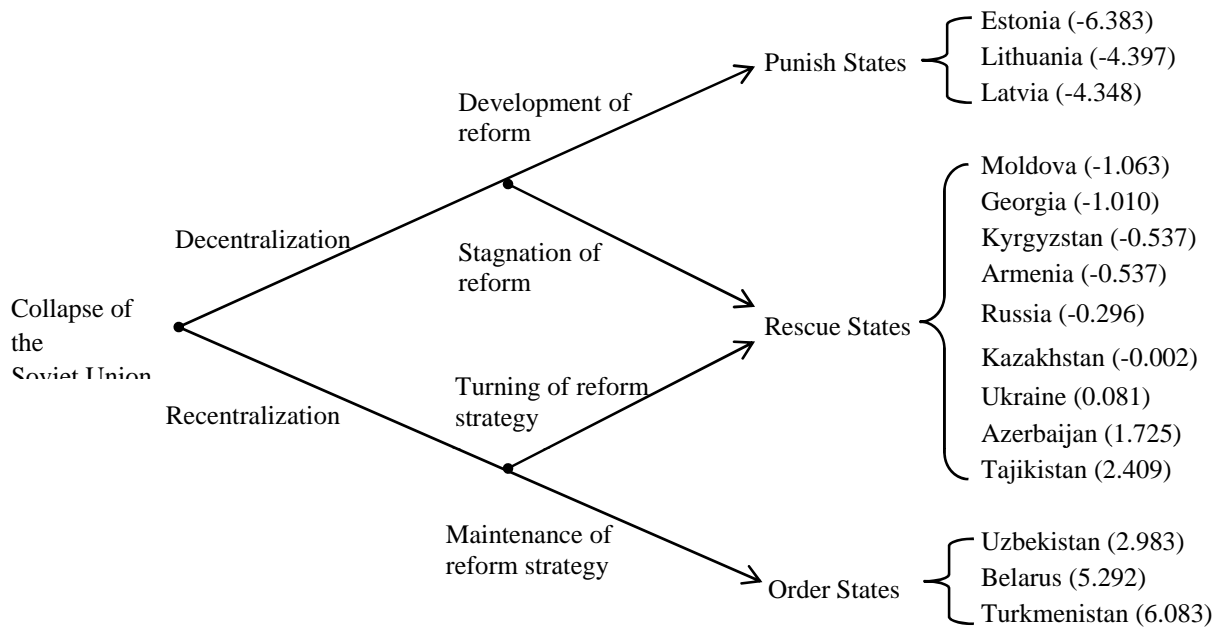
Note : 1) Author's estimation.

Table 2. Principal component analysis of decentralization of the government-business relationship

Component No.	Eigenvalues of the correlation matrix			Eigenvectors and component loadings of the first component		
	Eigenvalue	Accounted for variance (%)	Cumulative percentage of total variance	Variables	Eigenvector	Component loading
1	10.9665	0.6854	0.6854	Price liberalization	-0.2290	-0.7240
2	1.5268	0.0954	0.7808	Trade and exchange regime	-0.2637	-0.8350
3	1.1682	0.0730	0.8538	Small-scale privatization	-0.2793	-0.8881
4	0.8084	0.0505	0.9044	Large-scale privatization	-0.2566	-0.8230
5	0.5163	0.0323	0.9366	Competition policy	-0.1939	-0.6116
6	0.3122	0.0195	0.9561	Banking reform and interest liberalization	-0.2948	-0.9480
7	0.2517	0.0157	0.9719	Security market and non-banking sector	-0.2115	-0.6798
8	0.2369	0.0148	0.9867	Share of private sector in GDP	-0.2805	0.9675
9	0.1149	0.0072	0.9939	State regulation	0.1292	-0.8866
10	0.0516	0.0032	0.9971	Property rights	0.2379	0.3990
11	0.0232	0.0015	0.9985	Rule of law	0.2811	0.7622
12	0.0146	0.0009	0.9995	Democratization	0.3014	0.9027
13	0.0070	0.0004	0.9999	Economic freedom	0.2821	0.8548
14	0.0017	0.0001	1.0000	Number of administrative organizations in charge of industrial policy	0.2673	0.9620

Source : Author's estimation. For definitions, data sources, and basic statistics of the variables, see Appendix A.

Figure 3. Divergence of the reform process in FSU countries, 1999



Source : Author's illustration.

Note : The figures in parentheses indicate the component scores of the degree of decentralization / centralization of the government-business relationship.

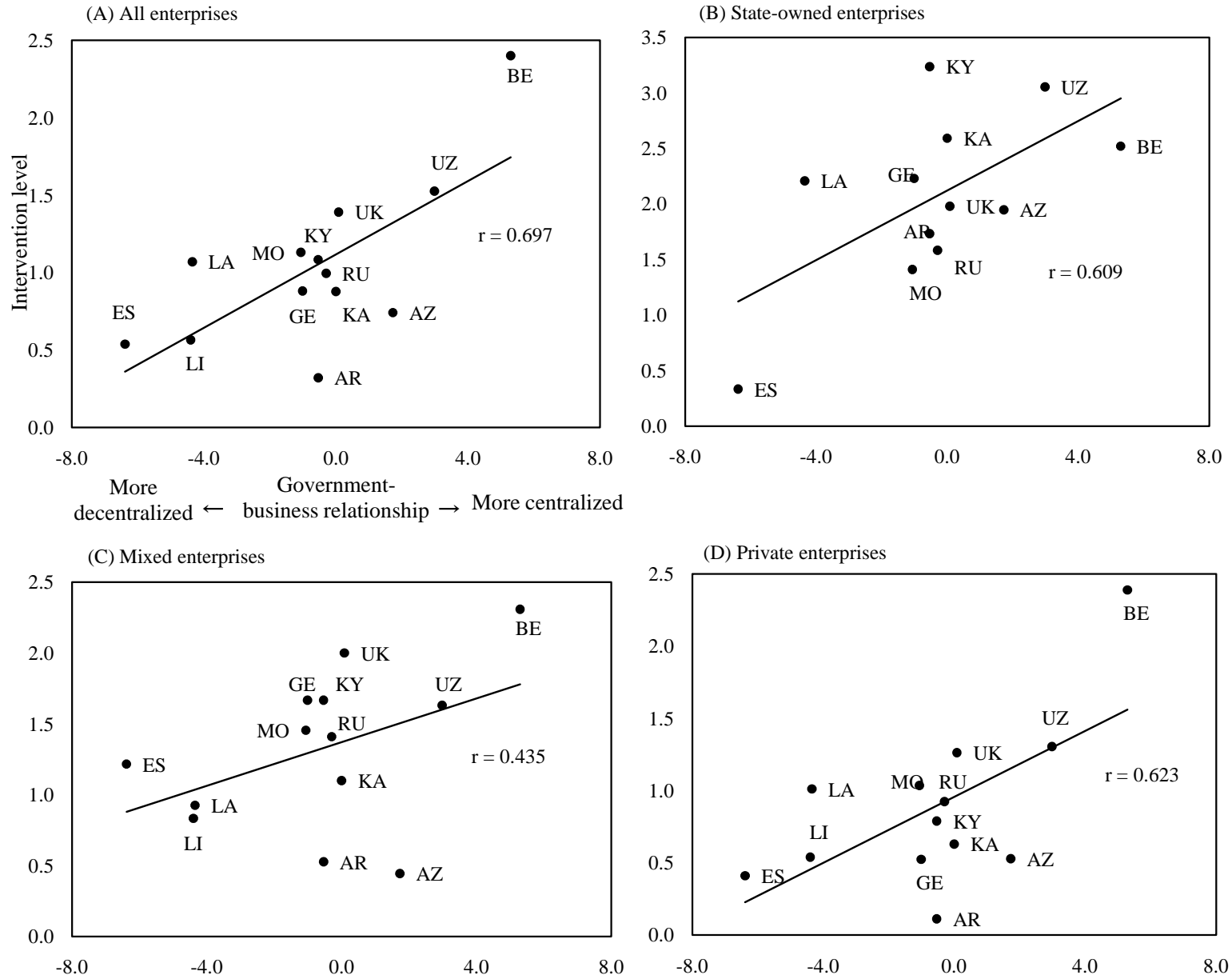
Table 3. Analysis of variance of government intervention in corporate management, bribe payments aimed at state capture, and degree of state capture

	(A) Degree of government intervention in corporate management				(B) Frequency of bribe payments aimed at state capture				(C) Degree of state capture			
	All enterprises	State- owned enterprises	Mixed enterprises	Private enterprises	All enterprises	State- owned enterprises	Mixed enterprises	Private enterprises	All enterprises	State- owned enterprises	Mixed enterprises	Private enterprises
Average by state type												
Order State	1.934	2.667	1.807	1.852	0.054	0.000	0.026	0.079	0.429	0.513	0.468	0.392
Rescue State	0.970	2.003	1.409	0.814	0.409	0.403	0.422	0.408	0.424	0.699	0.612	0.368
Punish State	0.766	1.487	1.045	0.687	0.448	0.300	0.333	0.481	0.730	0.860	1.206	0.623
ANOVA												
<i>F</i>	62.040	2.199	3.479	55.102	8.370	1.550	2.510	4.590	11.540	0.430	7.090	6.870
(<i>P</i>)	(0.000)	(0.115)	(0.033)	(0.000)	(0.000)	(0.218)	(0.084)	(0.010)	(0.000)	(0.651)	(0.001)	(0.001)
Bartlett test												
χ^2	45.489	4.297	4.390	32.778	224.708	1.337	98.382	105.670	2.523	2.381	1.474	1.382
(<i>P</i>)	(0.000)	(0.117)	(0.111)	(0.000)	(0.000)	(0.248)	(0.000)	(0.000)	(0.283)	(0.304)	(0.479)	(0.501)
Kruskal Wallis test												
χ^2	101.904	5.234	5.526	79.503	19.885	3.662	5.645	10.224	48.716	1.440	15.821	37.350
(<i>P</i>)	(0.000)	(0.073)	(0.063)	(0.000)	(0.000)	(0.160)	(0.060)	(0.006)	(0.000)	(0.487)	(0.000)	(0.000)
Multiple comparisons												
Order State vs. Rescue State												
Bonferroni	**	-	-	**	**	-	-	*	-	-	-	-
Scheffe	**	-	-	**	**	-	-	*	-	-	-	-
Sidak	**	-	-	**	**	-	-	*	-	-	-	-
Fisher	**	-	-	**	**	-	*	**	-	-	-	-
Order State vs. Punish State												
Bonferroni	**	-	*	**	**	-	-	*	**	-	**	-
Scheffe	**	-	*	**	**	-	-	*	**	-	**	-
Sidak	**	-	*	**	**	-	-	*	**	-	**	-
Fisher	**	*	**	**	**	-	-	**	**	-	**	*
Rescue State vs. Punish State												
Bonferroni	*	-	-	-	-	-	-	-	**	-	**	**
Scheffe	*	-	-	-	-	-	-	-	**	-	**	**
Sidak	*	-	-	-	-	-	-	-	**	-	**	**
Fisher	**	-	-	-	-	-	-	-	**	-	**	**

Source : Author's estimation.

Note : The significance of the difference in mean values between each state type is: **: at the 1% level, *: at the 5% level, -: lower than the 5% level.

Figure 4. Correlation between government intervention in corporate management and the government-business relationship



Source : Author's estimation.

Table 4. Regression analysis of government intervention in corporate management

Model	(A)	(B) ^a	(C)
Estimation model	Probit	Tobit	Heckman
Dependent variable	PINV	FINV	FINV
Const.	-0.320 *** (-2.77)	-0.413 ** (-2.25)	-2.215 (-1.24)
SIZE	0.096 *** (4.11)	0.171 *** (5.24)	0.274 *** (2.68)
SOE	0.486 *** (3.58)	1.194 *** (6.18)	1.700 *** (3.92)
MIX	0.353 *** (3.34)	0.575 *** (4.10)	0.936 *** (2.58)
FDI	0.071 (0.71)	0.152 (1.01)	0.227 * (1.66)
MNC	-0.160 (-0.68)	-0.426 (-1.23)	-0.688 ** (-2.23)
GBS	0.044 *** (3.74)	0.117 *** (7.04)	0.177 *** (3.71)
MILLS ^b			3.669 ** (2.05)
Industrial dummies	Yes	Yes	Yes
N	1771	1771	^c 1039
Pseude R2/Adj. R2	0.05	0.16	0.15
Log likelihood	-1133.89	-2600.08	
Wald test	116.49 ***	315.71 ***	194.13 ***

Source : Author's estimation. For definitions, data sources, and basic statistics of the variables, see Appendix A.

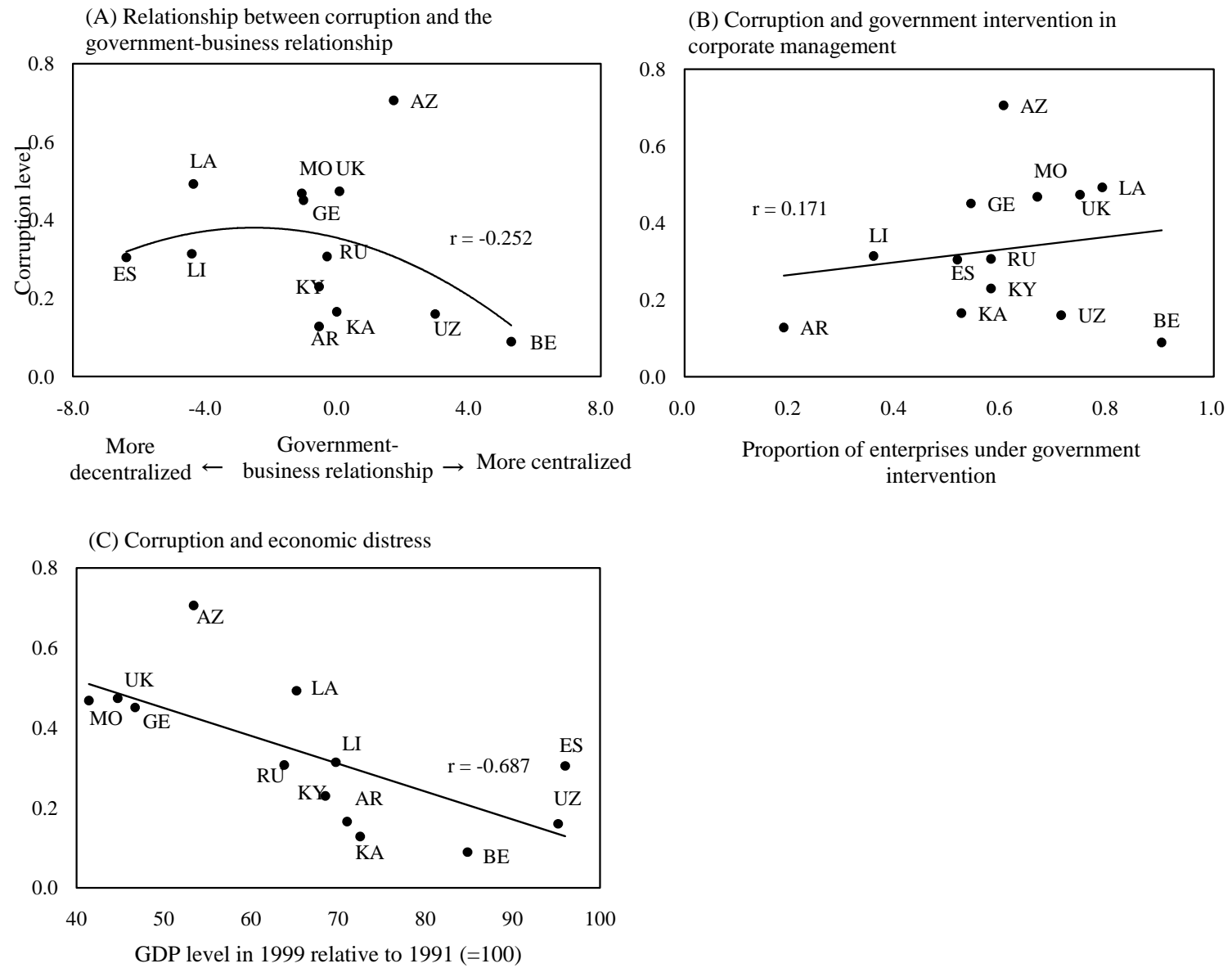
Notes: ^a Cragg test: $\chi^2=1354.458$ ***

^b Inverse Mill's ratio.

^c Sample sizes in the second estimation stage. The total sample size is 1771.

^d The figures in parentheses are robust t-statistics using the White's estimator of heteroskedasticity-consistent standard errors. ***: significant at the 1% level; **: at the 5% level; *: at the 10% level.

Figure 5. Correlation of corruption level and the government-business relationship, government intervention in corporate management, and economic distress



Source : Author's estimation.

Table 5. Regression analysis of corporate exploitation and state capture

Model	(A)	(B)	(C)	(D) ^a			(E)	(F) ^b	(G) ^c	(H)	(I)
Estimation method	Probit	Probit	Probit	Multinomial logit			Ordered probit	Tobit	Tobit	Heckman	Heckman
Dependent variable	PSQE	PBRI	PINF	PSQE	PBRI	PINF	DSQE	DBRI	DINF	DBRI	DINF
Const.	0.371 (0.52)	0.368 (0.49)	-0.967 * (-1.67)	2.949 ** (2.06)	2.671 * (1.68)	0.290 (0.28)		0.443 (0.25)	-2.043 ** (-2.14)	0.029 (0.02)	-1.086 (-0.44)
FINV	0.111 *** (2.54)	0.129 *** (2.84)	0.047 * (1.68)	0.313 *** (3.51)	0.371 *** (3.95)	0.187 *** (2.90)	0.116 *** (2.62)	0.347 *** (3.06)	0.072 * (1.67)	0.015 (0.06)	0.011 (0.17)
SIZE	-0.153 *** (-3.45)	0.100 ** (2.18)	0.128 *** (4.12)	-0.209 ** (-2.25)	0.287 *** (2.99)	0.236 *** (4.18)	-0.145 *** (-3.34)	0.219 ** (2.15)	0.233 *** (4.66)	-0.089 (-0.61)	0.148 (1.03)
SOE	-0.148 (-0.65)	-0.320 (-1.26)	0.305 ** (2.00)	-0.200 (-0.42)	-0.508 (-0.97)	0.406 (1.52)	-0.151 (-0.71)	-0.614 (-1.04)	0.452 ** (1.98)	1.275 (1.54)	0.144 (0.41)
MIX	-0.324 (-1.56)	0.018 (0.10)	0.157 (1.27)	-0.462 (-1.01)	-0.006 (-0.01)	0.229 (1.03)	-0.347 * (-1.77)	0.056 (0.13)	0.324 * (1.70)	0.060 (0.28)	0.219 (1.01)
FDI	0.389 ** (2.23)	0.282 * (1.79)	0.020 (0.15)	0.981 *** (2.79)	0.896 *** (2.80)	0.407 * (1.63)	0.415 *** (2.47)	0.590 * (1.70)	0.066 (0.32)	-0.273 (-0.56)	0.115 (0.71)
MNC	-1.073 ** (-2.09)	-0.443 (-0.93)	0.098 (0.31)	-2.287 ** (-2.01)	-1.145 (-1.06)	-0.338 (-0.59)	-0.954 * (-1.79)	-1.175 (-1.12)	0.065 (0.13)	-0.051 (-0.07)	-0.040 (-0.14)
GBS×DCS	0.156 *** (3.63)	-0.126 *** (-2.91)	-0.174 *** (-5.56)	0.177 * (1.84)	-0.353 *** (-3.72)	-0.325 *** (-5.73)	0.142 *** (3.38)	-0.303 *** (-3.07)	-0.304 *** (-6.04)	0.056 (0.23)	-0.182 (-0.96)
GBS×RCS	-0.241 *** (-4.03)	-0.052 (-0.80)	-0.130 *** (-3.34)	-0.403 *** (-2.92)	-0.123 (-0.80)	-0.188 *** (-2.77)	-0.250 *** (-4.22)	-0.134 (-0.87)	-0.215 *** (-3.56)	0.106 (0.48)	0.094 (0.64)
GDP99	-0.001 (-0.29)	-0.022 *** (-4.08)	-0.010 *** (-2.55)	-0.021 ** (-2.26)	-0.057 *** (-5.12)	-0.029 *** (-4.04)	-0.002 (-0.37)	-0.054 *** (-4.10)	-0.022 *** (-3.27)	0.014 (0.33)	-0.018 (-1.50)
LPOP99	-0.061 (-1.61)	-0.050 (-1.10)	0.027 (0.85)	-0.156 ** (-2.07)	-0.130 (-1.31)	-0.004 (-0.07)	-0.057 (-1.58)	-0.086 (-0.83)	0.089 * (1.67)	0.225 (1.63)	0.128 ** (2.43)
MILLS ^d										-1.686 (-0.73)	0.659 (0.43)
Industrial dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	1148	1148	1148		1148		1148	1148	1148	^e 97	^e 337
Pseudo R2/Adj. R2	0.11	0.13	0.08		0.12		0.08	0.08	0.07	0.06	0.06
Log likelihood	-329.69	-288.20	-639.44		-1149.70		-483.86	-408.05	-1030.58		
Wald test	75.54 ***	71.07 ***	105.08 ***		20554.00 ***		4492.01 ***	458.06 ***	1665.49 ***	172.56 ***	57.21 ***

Source : Author's estimation. For definitions, data sources, and basic statistics of the variables, see Appendix A.

Notes : ^a The base category for the estimation consists of enterprises that are not in the categories of squeezed, bribe, or influential firms.

^b Cragg test: $\chi^2=169.539^{***}$

^c Cragg test: $\chi^2=501.387^{***}$

^d Inverse Mill's ratio.

^e Numbers are sample sizes in the second estimation stage. The total sample size is 1148.

^f The figures in parentheses are robust t-statistics using the White's estimator of heteroskedasticity-consistent standard errors. ***: significant at the 1% level; **: at the 5% level; *: at the 10% level.

Appendix A. Definitions, descriptive statistics, and data sources of the variables used for empirical analyses

Variable name and definition	Descriptive statistics				Source
	Mean	Standard deviation	Min.	Max.	
Price liberalization	2.76	0.46	1.7	3.0	EBRD
Trade and exchange regime	3.04	1.21	1.0	4.3	EBRD
Small-scale privatization	3.45	0.74	2.0	4.3	EBRD
Large-scale privatization	2.69	0.76	1.0	4.0	EBRD
Competition policy	1.97	0.46	1.0	2.7	EBRD
Banking reform and interest liberalization	2.11	0.77	1.0	3.7	EBRD
Security market and non-banking sector	1.89	0.57	1.0	3.0	EBRD
Share of private sector in GDP	53.00	16.12	20	75	EBRD
State regulation	2.70	0.59	2.0	4.0	Heritage Foundation
Property rights	3.53	0.64	2.0	4.0	Heritage Foundation
Rule of law	5.00	1.26	2.63	6.38	Freedom House
Democratization	4.56	1.60	2.00	6.94	Freedom House
Economic freedom	4.38	1.41	1.92	6.42	Freedom House
Number of administrative organizations in charge of industrial policy	7.33	4.35	3	17	ROTOBO
PINV (Probability of government intervention in corporate management)	0.59	0.49	0	1	BEEPS
FINV (6-point rating of the frequency of government intervention in corporate management)	1.03	1.26	0	5	BEEPS
PSQE (Probability of enterprises becoming squeezed firms)	0.10	0.30	0	1	BEEPS
DSQE (6-point rating of the frequency of bribe payments by squeezed firms)	0.21	0.75	0	5	BEEPS
PBRI (Probability of enterprises becoming bribe firms)	0.08	0.28	0	1	BEEPS
DBRI (5-point rating of the level of state capture by bribe firms)	0.11	0.45	0	4	BEEPS
PINF (Probability of enterprises becoming influential firms)	0.29	0.46	0	1	BEEPS
DINF (5-point rating of the degree of state capture by influential firms)	0.36	0.75	0	4	BEEPS
SIZE (6-point rating of number of regular employees)	3.06	1.59	1	6	BEEPS
SOE (Dummy for wholly state-owned enterprises)	0.08	0.27	0	1	BEEPS
MIX (Dummy for mixed enterprises)	0.12	0.33	0	1	BEEPS
FDI (Dummy for foreign affiliated enterprises)	0.13	0.34	0	1	BEEPS
MNC (Dummy for multinational subsidiaries)	0.02	0.14	0	1	BEEPS
GBS (Degree of decentralization / centralization of the government-business relationship)	-0.65	2.64	-6.38	5.29	BEEPS
GDP99 (GDP level in 1999 relative to 1991=100)	65.23	15.90	41.35	96.02	World Bank
LPOP99 (Natural logarithm of the total population size in 1999)	16.52	1.61	14.13	18.80	World Bank

Appendix B. Additional estimation of FINV, SOE, and MIX variables

(a) Estimation results of FINV when excluding SOE and MIX from the independent variables

Model	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)		
FINV	0.098 ** (2.35)	0.114 *** (2.72)	0.064 ** (1.91)	0.294 *** (3.52)	0.339 *** (3.99)	0.211 *** (3.30)	0.102 ** (2.38)	0.319 *** (3.01)	0.101 ** (1.85)	0.112 (0.56)	0.037 (0.87)

(b) Estimation results of SOE and MIX when excluding FINV from the independent variables

	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)		
SOE	-0.009 (-0.04)	-0.160 (-0.71)	0.356 ** (2.36)	0.170 (0.40)	-0.039 (-0.09)	0.571 ** (2.14)	-0.010 (-0.05)	-0.202 (-0.37)	0.532 ** (2.19)	1.071 * (1.64)	0.135 (0.82)
MIX	-0.254 (-1.22)	0.080 (0.44)	0.176 (1.43)	-0.317 (-0.69)	0.182 (0.49)	0.299 (1.37)	-0.271 (-1.39)	0.223 (0.54)	0.353 * (1.78)	-0.007 (-0.03)	0.075 (0.54)

Source: Author's estimation.

Note: The figures in parentheses are asymptotic t-values (z-values). ***: Significant at the 1% level; **: Significant at the 5% level; *: Significant at the 10% level