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Banking on Uncertainty: The Effects of Institutional Quality on Commercial and Consumer Credit in Russian Regions

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**Banking on Uncertainty:
The Effects of Institutional Quality on Commercial and Consumer Credit in
Russian Regions**

Katherine Ollenburger
Economics Honors Thesis
Advisor: Gary Krueger
May 5, 2008

Katherine Ollenburger

**Banking on Uncertainty:
The Effects of Institutional Quality on Commercial and Consumer Credit in
Russian Regions**

ABSTRACT:

Accompanying the recent credit market developments in Russia, banks have shifted their portfolios to a higher proportion of retail lending relative to commercial credit. This paper offers a microeconomic approach to explain this phenomenon, unsatisfactorily addressed in the literature. It focuses on the role of institutions in the rapid increase of individual lending. Using oblast level data from the Central Bank of Russia, it develops a model of lending decisions and uses time fixed effects to estimate the correlation between variations in institutional quality and increased loans to individuals.

INTRODUCTION:

Following Russia's "Wild Nineties," the last eight years have ushered in a period of increased stability and increasing credit. Such stability has also led to an improvement in institutional quality¹ seen in emerging capital and labor markets. This improvement in the business environment has helped to ease the credit constraint to both consumers and corporations. Loans to both individuals and firms increased dramatically in this period of stability, with bank portfolios exhibiting a shift toward consumer credit.

Since 1999, I observe a dramatic increase in the proportion of loans going to individuals as opposed to companies. Given the liquidity crisis firms felt in the nineties as well as the characteristics of each type of loan, this shift is counter-intuitive. Banks are assumed to maximize profit; however, individual loans are more costly to administer and monitor than commercial loans. Thus, their return per dollar loaned is lower than the

¹ By institutions, I mean the economic rules of the game, the assumptions that govern how people relate to one another and how firms interact within a market. These are things like property rights, an accepted rule of law, generalized trust, and social capital. It could also be the ability to enforce contracts backed by impartial courts and legislation.

return to loans to companies. Commercial loans on the other hand are less costly, but more uncertain—which is in itself expensive for banks. If banks are indeed maximizing their profit, the shift toward individual loans must indicate that the costs of high uncertainty outweigh the benefits of low administrative costs. What is occurring in Russia to explain this high uncertainty?

In order to address this question, I examine the role of varying institutional quality across regions of Russia. My focus stems not only from an extensive literature on the importance of institutions and contextualizes my study within the transition to a market economy, by underlining the importance of the development of market supporting institutions in the form of factor markets and rule of law for systemic change. It also highlights the divergent trends on a regional level despite the political trend of greater federalism and central control under Putin.

In light of this dichotomy between federal and oblast level trends, I focus my research at the microeconomic scale, underlining the decision making process of banks. My theory rests on the supply side determinants of bank lending across regions: the specific factors of bank diversification behavior, focusing on the institutional quality. Throughout transition, both firms and individuals faced severe credit constraints. This justifies the assumption that lending behavior must be understood through supply side considerations. Demand for loans should be perfectly elastic for each bank regardless of region.

These supply side arguments lead to the importance of institutional quality for bank decision making processes. Although there is a strong body of literature on the importance of institutions for growth and for successful transition, this body of work has

not been brought to bear on banks portfolio adjustments. The lack of empirical research linking institutions to bank lending portfolios specific to a transition context gives my paper greater relevance. It addresses a phenomenon that has not been adequately explained from a new perspective.

This paper argues that the institutional quality varying across Russia's regions explains regional disparities in bank decisions. It addresses this question in six sections. The first outlines the background of the question, focusing on the Russian banking sector and the phenomenon provoking my research. The second reviews the literature, identifying the debate within bank lending decisions and positioning my paper within the field. The third outlines a theoretical model of bank portfolio diversification before refining that to an empirically estimable form. The fourth explores the variables used as proxies in the model and outlines the data constraints faced in this paper, while the fifth analyzes the empirical results. Conclusions are given in the final section.

SECTION ONE: *Background*

The Russian banking sector has undergone significant reform since transition, most dramatically after the 1998 financial crisis. Figure 1 illustrates the growth in lending to the private sector from 1999 to 2006, showing the dramatic increase in the proportion of lending to individuals. In 1999 with loans to the non-financial sector running approximately 10 percent of GDP, loans to private individuals were approximately 8 percent of the total. By 2006, with total credit outstanding close to 30 percent of GDP, loans to individuals constituted approximately 30 percent of total lending. These changes translate into a growth rate of almost 6 percent per month for loans to individuals

versus 4 percent per month for loans to corporations from January 2000 until December 2006.²

This paper attempts to explain this dramatic shift in the context of institutional variance across regions. Huang, Marin and Xu (2004) offer a macroeconomic explanation of the retail sector crowded out by government loans, shedding some light on the problem, as seen in Figure 2. This hypothesis, however, explains only roughly 75% of variation.³ Certainly, a macroeconomic understanding of the interplay between the government and private sector in terms of competition for loans is a valuable explanation for credit trends. It does not, however, provide an entire explanation. Its incomplete nature is underlined by the variation in lending across regions. Some regions receive much higher loans of both types than do others. See Graphs 1.1 and 1.2 for differences in loans across regions. This implies some disparity in the investment environment of regions.

A disparity in this investment environment may be indicative of institutional variance across regions. Indeed, measures for institutions show marked variation among regions, as can be seen in Graphs 4.1, 4.2, and 4.3. This variation becomes particularly interesting in light of the political climate of Putin's Russia. Over his terms, Russia has become increasingly centralized, with Moscow gaining greater control and power at the expense of regional autonomy. This has been legitimized through the assumption of bringing greater stability and political impartiality across regions, with important

² Calculations based on data from the Central Bank of Russia web site: www.cbr.ru.

³ A regression of the two series with credit to the private sector as the dependent variable explains roughly 75 percent of the variation in bank lending. An examination of the residuals from this regression reveals a noticeable upward trend; however, which, when included in the regression, improves the overall fit to approximately 90 percent.

implications for economic growth. My research, however, seems to indicate that the increasing federalism has not, in fact, led to uniform institutions or a uniform investment climate across the federation. Thus, I turn to a microeconomic explanation focused on the well-established literature of the importance of institutions in diminishing risk and the importance of risk management in banking in order to develop a model to explain rapid retail credit growth.

SECTION TWO: *Literature Review*

The economic value of institutions has been shown in their ability to diminish transaction costs through lower uncertainty. Institutions are the governing dynamics or fundamentals of a market,⁴ the devices framing transactions and outlining the rules of the game (North 1991; Rodrik, Subramanian, and Trebbi 2002). This role has been studied in divergent development (Acemoglu, Johnson, and Robinson 2001; La Porta, Lopez-de-Silanes, Shleifer, and Vishny 1997), the tradoff between disorder and dictatorship (Djankov et al 2003), and difficult transition, emphasizing on a broader scale the importance of institutional quality for investment and growth. Within the literature of transition, this economic logic has been explored in terms of macro stabilization (Godoy and Stiglitz, 2006) and micro output growth (Engerman and Sokoloff, 2003; Hall and Jones, 1999; Fedderke, de Kadt, and Luiz, 1999). Olson et al (1998) also analyzes the importance of third party enforcement of contracts in order to separate transactions in time.

⁴ Fukuyama, Olson, and Putnam have contributed valuable work on the role of trust and civil and social groups on diminishing transaction costs and risk.

Russia early in transition provides a case study of poor institutional quality and its consequences. With the rise of the unofficial economy (Johnson et al, 1997) and the chaos of privatization (Blanchard and Kremer, 1997; Djankov and Murrell, 2002), firms attempted to operate within an institutional vacuum.⁵ Hoff and Stiglitz (2005) and Frye (2004) outline the decision of these firms to demand property rights, while Popov (2000) demonstrates the drop in investment in Russian regions when these property rights do not develop. His study underlines the divergent transition experience across regions: institutional quality is not uniform throughout Russia.

This institutional variance has important consequences for firms. Ivanenko (2004), Marin and Schnitzer (2002), and Krueger and Linz (2001) show the shift of firms to a barter system when facing illiquidity in a risky environment.⁶ These firm actions occur within an equally shaky politico-institutional environment, which may influence output growth (Ahrend, 2002). Lambert-Mogiliansky, Sonin, and Zhuravskaya (2007) find that regional/federal power struggles influence the effectiveness of commercial courts to influence restructuring or liquidation of unprofitable firms, increasing the risk of investment by firms as well as lending to firms. For instance, firms with close ties to political elites may gain preferential treatment through specifically designed legislation, increasing the uncertainty facing the bank.

Operating within this institutional paradigm, banks perceive the increased risk of an imperfect business environment. The literature outlines the challenges facing banks

⁵ Campos and Coricelli (2002) explain the institutional collapse facing post-Socialist countries following the collapse of the Soviet Union in the period of transition.

⁶ Gaddy and Ickes (1998) blame arrears and non-monetary trade on attempts to hide output from tax collection authorities, a hypothesis rejected by managers of Russian firms, as cited in Krueger and Linz (2001)

due to asymmetric information (Pyle, 2001), extractions of corrupt banks (Beck, Demirgüç, and Levine, 2005), and creditor rights and corrupt law enforcement (Claeys and Schoors, 2007). This risk is associated with a poor institutional environment; thus, the low level of lending to firms should be unsurprising. Other explanations for this phenomenon, however, focus on the lack of firm restructuring or preference for direct financing (Kraft, 2007) or higher demand for mortgages and consumer spending (Strebkov, 2005). Given the woefully underdeveloped methods for alternative financing in Russia, this explanation is intellectually unsatisfying.

Government participation plays an important role in lending decisions, as it can increase economic stability but may simultaneously increase uncertainty. As transition has progressed, several studies have underlined the consequences of shoddy institutions for government involvement. Huang, Marin, and Xu (2004) explain bank lending as a function of improving government finance, wherein government borrowing in the nineties crowded out individual credit. Slinko, Yakovlev, and Zhuravskaya (2004) also focus on government involvement, focusing on the ties between the government and individual firms that may crowd out small and medium enterprises. They compile an index of state capture, which I use to measure institutions. Pyle (2007) broadens the study of government, introducing the importance of the political regime in establishing secure property rights across regions to diminish the uncertainty facing banks.

The banks' observation of uncertainty is coupled with a desire to manage risk. From a general finance perspective, Santomero (1997) reviews the actions of lending institutions to eliminate and manage risk through credit rating analysis and other methods to eliminate informational asymmetry in determining their loan portfolio. Loan structure

also changes in response to better contract enforcement and rule of law ⁷ (Qian and Strahan, 2005). Haselmann and Wachtel (2007) examine transition banks' risk taking propensity, finding that risk aversion is present across countries, with collateral laws and enforcement determining risk. Even in poor institutional environments, banks seek to manage risk, learning to operate in an unsound environment. How does this observation influence portfolio decisions?

In order to manage risk, banks change their behavior. This diversification reflects the institutional environment in which banks operate. They seek to manage the risk they face in terms of repayment as well as uncertainty of the ability of the firm to repay the loan in the future and the possible interference of the state. Risk arises from the uncertainty of firms' future performance as well as the ability of banks to collect loans in default. Due to this risk, banks will diversify their portfolios away from commercial lending. Thus, my question draws from two points within the literature: (1) banks seek to manage risk through loan structures and portfolio diversification and (2) institutions decrease transaction costs and uncertainty, reducing risk. Strong institutions should mitigate risk, leading banks to lend more through less costly commercial loans. The next section outlines a model to conceptualize this theory.

SECTION THREE: *Theory*

I develop a theory to explain banks' lending decisions based on this theory of risk aversion and institutional constraints. I borrow from Laderman, Schmidt, and Zimmerman (1991) who analyze bank diversification based on agricultural loans and

⁷ They find that risks such as low property rights or high corruption are dealt with through secured loans, shorter maturity, and higher interest rates.

branch location. They analyze whether or not banks in rural areas extend more agricultural loans due to a decrease in the monitoring costs of proximate activities. Thus, they base their model on asymmetric information and its effects on bank profitability. While their specific subject does not directly relate to my question, their model provides a framework from which to study the way banks manage and minimize risk through portfolio diversification.

The assumption that Laderman et al. (1991) follow and that I adopt is banks seek to maximize profit subject to uncertainty. They provide a preliminary model of simple profit as a function of total revenue less total cost where revenue is determined by the interest rate and money loaned and total cost is divided into the cost of obtaining loanable funds, administering and monitoring loans, and the uncertainty of returns:

$$(1) \text{Max } (\pi) = \theta i_I + (1-\theta)i_F - \theta C_I - (1-\theta) C_F - r_d$$

where θ is the proportion of loans allocated to consumers, i_I is the interest rate facing an individual, i_F is the interest rate facing firms, C_I and C_F are the monitoring costs of loans to individuals and firms, respectively. Monitoring costs would be a function of asymmetric information or uncertainty and the cost of administering a loan. Due to the nature of each type of loan, the cost of administering a loan is higher per dollar for individuals. r_d is the cost of obtaining loanable funds. Uncertainty complicates this theory. As profits cannot be predicted exactly, banks attempt to limit the variance of their expectations. Introducing the constraint of uncertain information, the objective function becomes:

$$(2) \text{Max } (\pi) = \theta i_I + (1-\theta)i_F - \theta C_I - (1-\theta) C_F - \beta \text{var}(\theta \rho_I + (1-\theta)\rho_F) - \theta \alpha_I \text{var}(\rho_I) - (1-\theta)\alpha_F \text{var}(\rho_F) - r_d$$

where ρ_I and ρ_F are the expected returns to loans to individuals and firms, respectively.

The introduced uncertainty measures the cost of bankruptcy ($\beta \text{var}(\theta \rho_I + (1-\theta)\rho_F)$) and the cost of defaults in both consumer [$\theta \alpha_I \text{var}(\rho_I)$] and commercial [$(1-\theta)\alpha_F \text{var}(\rho_F)$] lending.

Strong institutions diminish this uncertainty. Of course, by adding uncertain returns to the lending framework, I highlight the specific principal/agent problem that emerges within the banking sector. We also see interplay between the expected return as determined by the interest rate and variance of that expectation as shown with ρ . Stiglitz and Weiss (1981) point out the tradeoff between expected return and riskiness as well as the effects of changing interest rates on the quality of borrowers attracted. Thus, expected profits must be determined by acknowledging the uncertainty that arises from both changes in interest rates as well as variations in the expected ability to pay. This variance of expectation is aggravated by the asymmetric information held by the borrower (Huang et al. 2004) and the involvement of the government in protecting firms from their creditors (Slinko et al. 2004). As I observe a proportional increase in the individual share of lending it must follow from a profit maximizing assumption that:

$$(\downarrow r + \uparrow C_A + \downarrow \text{var} \rho)(\theta) < (\uparrow r + \downarrow C_A + \uparrow \text{var} \rho)(1-\theta) \text{ where } \rho = f(\lambda_i, \lambda_g)$$

Here, r is the return from the loan, which is linked to the interest rate and money loaned. C_A is the cost of administering the loan. ρ is the expectation, whose variance shows the uncertainty associated with the loan. λ_I is the probability of insolvency, and λ_g is the probability of government involvement. More administratively costly, lower returning individual loans with lower uncertainty must be more profitable than administratively cheap, high return commercial loans that are highly uncertain. To study this relation, I explore the effect of the variant institutional quality across regions to explain the increases in individual lending.

Due to divergent initial conditions across region and transition experiences, Russian regions show high variation in commercial and consumer credit as well as institutional quality.⁸ To study this variation empirically, I model lending as a function of income level, creditworthiness, bank penetration of the region, and economic institutions. This analysis focuses on the profit-maximizing decisions of bank; thus, it does not directly take into account any higher firm profitability stemming from institutional quality.⁹

By adopting this model, I implicitly place Russia beyond transition by excluding variables specific to the transition process. Institutional quality is the only hangover of a Socialist or pathological economy in my model, placing the Russian capital market outside the period of non-monetary trade and barter. Transition, and the risk associated

⁸ Krueger and Ciolko (1998) expose the importance of initial conditions in national transition experiences while Popov (2000) shows the divergence of regional development in Russia.

⁹ Indeed, the concept of institutions is far more comprehensive than the monitoring capability of a bank, with implications for the firm. Firms can afford investment only if they have access to capital, can transact only when contracts are enforced.

with it, is not part of the analysis. Leaving out these variables, theory leads to an empirical model with a testable hypothesis:

$$\text{Loans} = f(\text{price of loan, monitoring costs, expected return/default})$$

This model comes directly from Laderman et al (1991), while my paper develops proxies for these concepts specific to my question.

SECTION FOUR: *Empirical Model*

To apply this theoretical framework to commercial and consumer credit in varying institutional environments, I operate from the empirical model:

$$\text{Loan}_{i,t} = \beta_0 + \beta_1 (X_{i,t}) + \beta_2 (\text{institutions}_{i,t}) + \varepsilon$$

This equation is estimated for two dependent variables: amount of regional consumer and commercial credit per capita. Data is measured at the regional level over time. The variable of interest is a measure of institutional quality. Regions with poorer institutions would exhibit greater uncertainty. X is a matrix of variables to control for changes in income, risk, and penetration. The dependent variables are derived from data provided on total non-financial lending to individuals and firms, and the set of controls are overdue loans—measuring risk; branches of lending institutions in each region—measuring the integration of the banking sector in the region; and gross regional product per capita—incorporating some measure of demand factors. The Central Bank of Russia has

published a regional Bulletin of Banking Statistics beginning in 2001, which publishes the credit, overdue, and branch data. Goskomstat provides GRP and population data.¹⁰ I also include a dummy variable for Moscow. These data covers 79 regions across Russia between 2001 and 2005, giving a balanced panel. See Table 4.1 for a summary of the variables.

Each set of regressions includes three measures for institutions. An accurate measure for institutions is difficult to find, as indicated in the literature. On a national level, non-governmental organizations have developed indices of institutional quality, focusing on aspects such as property rights, corruption, or rule of law. Less research has been done charting institutional quality across regions. Popov (2000) does look at institutional determinants of growth across Russian regions, using a liberalization index developed by the Russian Union of Industrialists and Entrepreneurs. Following the indicators of such organizations as the World Bank, the index measures the investment climate and business conditions of each region. While this index provides a benchmark for institutional quality, it is only available for 1996, limiting its explanatory power. The second measure comes from Slinko et al (2004). Their capture index measures preferential treatment of firms by region based on data from 1995 to 2000. Like Popov's index, however, this institutional measure is available for only one year. Because they are only available for one year, I must assume that institutional quality does not change when using the 1996 data for each year in the sample.¹¹

¹⁰ Unfortunately, population data from Goskomstat are only available for 2002. Thus in calculating per capita concepts, I must assume that the population remains constant from 2001-2005.

¹¹ Given the rapidly changing business environment of transition economies, this assumption is highly suspect. Anecdotal evidence suggests that institutions should be

To confront this problem, I develop an institutional measure from Olson et al's (1998) theory of institutions. They analyze transactions, developing a theory relating exchanges separated in time to third party enforcement in the form of institutions.¹² Olson studies contract intensive money, defining Type I (cash) versus Type II (credit) transactions, analyzing a dichotomy between no trust in the banking sector versus full trust in the banks, which should be a function of some institutional quality. Thus, societies are positioned at some point between the two:

$0 < (M2 - \text{Cash}) / M2 < 1$, where 0=Cash only and 1=Full trust

I calculate the measure of institutions by regressing total bank deposits per capita per region by the GRP per capita using random effects.¹³ This gives a set of residuals that show in which regions people invest proportionally more or less of their income for each year. See Graph 4.3 to see measures of institutional quality, with Moscow and St. Petersburg having strong institutions and Tyumen and the Chukotka Autonomous Region far below the predicted. This measure of institutions, however, carries its own limitations.

experiencing significant change over time. Unfortunately, it is the only measure available to me.

¹² In their theory, these institutions are backed by a functional government in the form of a "settled bandit," granting the security necessary for increased investment—McGuire and Olson (1996). The government should consolidate power following the transition, eliminating competition for rents (taxes) and providing public goods—such as property rights and contract enforcement.

¹³ I estimate deposits per capita from regional deposit data available at cbr.ru/eng and population data from Goskomstat. Data constraints force me to assume that population remains constant over time. While it seems likely that there would be some movement between regions as well as overall growth, changes in credit behavior should far outweigh in magnitude these shifts.

While it provides a unique data point to exploit my collected panel, it is likely endogenous to lending.

SECTION FIVE: *Analysis*

I estimate the basic theoretical model, with individual and commercial loans per capita as a function of GRP per capita, branches in each region, overdue loans, a Moscow dummy, and a measure of institutions. Results are presented in Table 5.1. When comparing the estimations of both individual and commercial lending per capita, several interesting results are apparent. First, the model much better explains regional variation in commercial lending. For the Popov, Slinko, and residual generated measures of institutions, the model explains 69.81%, 69.45%, and 80.29% of commercial lending, respectively. This is compared to 33.66%, 35.56%, and 43.24% of the variation in individual lending. Each coefficient in each of the three models is higher and more significant in describing commercial loans. This is most dramatic in the constant and Moscow dummy terms. The strongly positive constants would indicate that, due to the inclusion of GRP in the regression, lending is outstripping income growth. This could be a result of an extended period of illiquidity in the nineties. It could also indicate an oversupply of credit.¹⁴ Apparently, the effect of being in Moscow has a much stronger positive effect for firms seeking loans than for individuals. In Model 3, however, the effect of being in Moscow is negative, large, and highly significant. Due to the institutional strength I observe in Moscow, this tends to support my theory: where

¹⁴ This is especially interesting in light of the international credit market collapse in late 2007, early 2008.

institutional quality is good, banks lend more to firms. As a corollary, individual loans may be lower as firms substitute away to more profitable lending.

Unexpectedly, the sign for overdue loans is positive in the initial model. Theory suggests that overdue loans, with their implied increased risk, should have a negative effect on lending, regardless of institutional quality. While the sign on overdue loans is negative in each of the six estimated models, it is only significant in explaining commercial loans. This could be due to inexperience or increasingly risky behavior in the banking sector. This calls into question the position of banks as risk averse, as they would appear to be more willing to take on risky loans. The Central Bank of Russia, however, found in 2004 that banks' loan portfolios did not exhibit any factors of significant deterioration in quality. This leads me to believe that my result is more a function of the increase in overall banking activity without any implication of causality. Thus, it is consistent with the risk analysis of lending decisions. Essentially, it could be attributed to a magnitude increase rather than a share increase. With increased total bank lending, profits may be high enough to cover non-performing loans or total increases leading to increasing total overdue loans. Even if the proportion of overdue loans to total loans is constant, increasing the amount of lending will increase the amount of overdue loans without necessarily increasing the riskiness of the loan portfolio.

Also troubling is the unexpected negative sign on branches, the measure of bank penetration. One would expect that more branches would lead to increased lending; however, the model indicates otherwise. In each of the models for individual loans, the coefficient is indistinguishable from zero. This is not the case, however, for commercial loans. This could be indicative of a phenomenon introduced in Pyle (2002) wherein firms

in regions with more banks find it easier to get loans from any one of the branches.

Essentially, a lack of information sharing among banks make it possible for firms with a high probability of future insolvency to borrow from a variety of sources, moving money around the banks while defaulting on their current debt. Banks may realize this, and thus, in the presence of other banks, diminish their loans to firms.

As would be expected, the measure of institutions derived from the deposit/GRP residuals outperformed the other measures in explaining both individual and commercial lending. Interestingly, the Slinko et al Index was more successful in explaining individual loans, while the Popov Index both explained more commercial lending. It should be noted that the sign on the capture index is contrary to what I would expect, ascribing a positive relation between government capture and lending to individuals. More specifically, given the stronger correlation between individual loans and state capture, the positive sign implies that banks in regions with more government intervention prefer to lend to individuals. An interview with the vice president of a large regional bank in Tver oblast suggests that banks prefer to lend to individuals versus firms as they find it easier to recover their money from individuals as opposed to politically connected firms. This would explain the positive sign on the capture index in the second model of individual loans per capita. It does not explain the positive sign in the second model of commercial loans per capita. Its coefficient, however, is statistically indistinguishable from zero. This could be a response of banks to lend to smaller businesses and individuals in regions that are dominated by well-connected firms. Thus, banks may shift their portfolios from corporate loans to individual loans, which are more costly to administer, but easier to

recover in the case of a default. Increased lending to individuals can be seen as a response to the still problematic Russian legal environment, thus, consistent with my theory.

Although these models provide a strong basis for research, their necessary assumption of static institutions is not intellectually satisfying. In order to study the interaction of the Popov and Slinko et al Indices over time, I define a variable by year for each. With this set of variables, I allow the correlation of the index to change over time. I then study these time-separated indices in the previous model. See Table 5.2 for results. While this does not solve the data availability problem, it does introduce some dynamism to the analysis. Especially in the case of the Popov Index, several interesting results emerge. In Model 1, notably, “branches” switches to the expected sign, indicating that increased bank penetration leads to increased loans to individuals. Moreover, it becomes significant to a 99% confidence interval. The sign on overdue loans also switches to the expected negative in Model 1, although it is statistically indistinguishable from zero.

In terms of the Popov’s measure of institutions, the most obvious change in Model 1 is its negative sign for 2001-2003. In those years, this indicates that better business conditions crowded out loans to individuals. This effect diminishes over time, to the point that it becomes positive in 2004 and 2005. Apparently, as business conditions improve, banks learn to administer both types of loans. This analysis is supported by the Popov Index in Model 4, wherein better business conditions in every year after 2001 lead to stronger and more significant increases in commercial lending over time. Thus, banks learn to operate within their specific environment.

The Slinko et al Index, interestingly, shows less significant change when allowed to estimate a different coefficient for each year than does the Popov Index. In the models

without differentiation among years, it explained greater variation in individual loans than did the Popov Index. In this Model 2, it explains little variation with little significance before 2004. In 2004 and 2005, however, it is large and significant. This seems to indicate that over time, as banks see the effect of government capture, they substitute away from commercial loans. This is consistent with the original hypothesis: in institutionally deficient regions, banks substitute away from less certain loans to firms to more administratively costly loans to individuals. Troubling, however, is the sign, magnitude, and significance of the Capture Index in 2004 in Model 4. Why, in this one year, did banks in regions with high state capture increase their loans to firms? This could be due to expectations arising from bank reforms instituted in 2003. The negative sign on capture in 2004 would seem to indicate that banks then corrected their behavior. This sign, once again, is statistically indistinguishable from zero. These results seem to show that over time banks learn and adjust their behavior to accommodate the institutional environment in which they operate, changing their loan portfolios accordingly.

Due to the unavailability of GRP data, the full model cannot be estimated after 2005. In attempting to continue the investigation of institutional influence, I utilize a set of year dummy variables. This controls for change each year in essentially a fixed effects method. Results are in Table 5.3. In studying the residuals from this system of equations, I find that the restricted model consistently fails to predict retail lending in Moscow, oil rich Tyumen, and Novosibirsk, the science center. This further analysis continues to support my theory. Since the model improves over time, one can infer that banks become better able to manage their risk over time. This reflects the increasing stability of Putin's Russia wherein a lesson from one year remains relevant in the next. It supports and

continues the trend of the correlation between institutional quality and lending, holding constant regional differences per year.

SECTION 5: *Conclusions*

Preliminary analysis presented in this paper indicates that institutions are very important in explaining lending behavior. Banks diversify their portfolios between firms and individuals in response to institutional variations across regions. When banks feel threatened, they prefer to lend to individuals. This paper examines an under-explored phenomenon in the Russian credit market, but is hampered by several serious limitations. Although banking data are more readily available, a measure of institutions that can exploit these data is problematic. Defining and measuring such an ephemeral concept is difficult in any context; such difficulty is magnified at the regional level as well as in the Russian context. The indices made available by Popov and Slinko et al provide valuable starting points, but lack a unique observation for each region over time. More importantly, the deposit residual measure as a proxy for trust is in all likelihood endogenous to the dependent variable. Certainly, a more complex system of equations is necessary to address this problem.

Furthermore, the theoretic model is not derived from a transition specific context. By adding explanatory variables specific to institutional and systemic transition the model could improve substantially. It begs the question: when is transition over? At what point can analysis ignore the USSR in studying Russia? This approach also limits market imperfections to institutional quality. Flaws in the capital market structure should inform banks' behavior, but I do not include specific deficiencies in my model.

Despite the limitations, my research seems to suggest three broad conclusions. First, liberalization and better business conditions best explain higher commercial lending. Second, individual lending can be seen as banks' substitution decision in the face of government capture. Third, an institutional measure based on the theory of contract-intensive money—a measure for the underlying rules of enforcement—explains both loan types, showing that commercial lending requires stronger institutional quality to diminish risk. Within the political context of increasing federalism, the variability of institutional quality points to the incomplete process of creating uniform business conditions.

Applied to the macroeconomic lending reality, these results, though somewhat troubling, indicate serious institutional lack in Russian capital markets. This calls into question Putin's legitimation of his increasingly authoritarian government, as it has not produced stability and uniformity to the level necessary for a truly secure investment climate. Essentially, there is a potential for higher profit that cannot be exploited due to market imperfections. Assuming that banks maximize profit, their rational behavior leads to an inefficient allocation of scarce resources, as credit is channeled to individuals. Institutions can correct this. In terms of policy implications, institutions should be developed to ease firms' credit constraint. Specifically, institutions that foster good business conditions should be encouraged; the government should more fully exit the private sphere, promoting an impartial rule of law; and while better institutional quality should lead to increases in non-financial lending of both types, serious institutional reform is necessary to shift portfolios to more efficient allocations.

In sum, my research provides an important starting point for a previously unexplored area of capital market development. It Despite the limits of my model's explanatory power, it speaks to a little explored piece of Russian financial development and seeks to explain the recent rise in consumer credit across regions from a bank level perspective, providing a new facet to the literature of institutional economics and transition theory. Building from this paper, further research should center on correcting data problems and robustness checks, incorporate more capital development theory into the model, and attempt to address the issue that transition might not be over. While this paper explores the causes of divergent investment patterns based on institutional quality, it does not delve into the implications of this portfolio diversification. Thus, further research must consider the value lost from the diminished spillover effects of loans to individuals.

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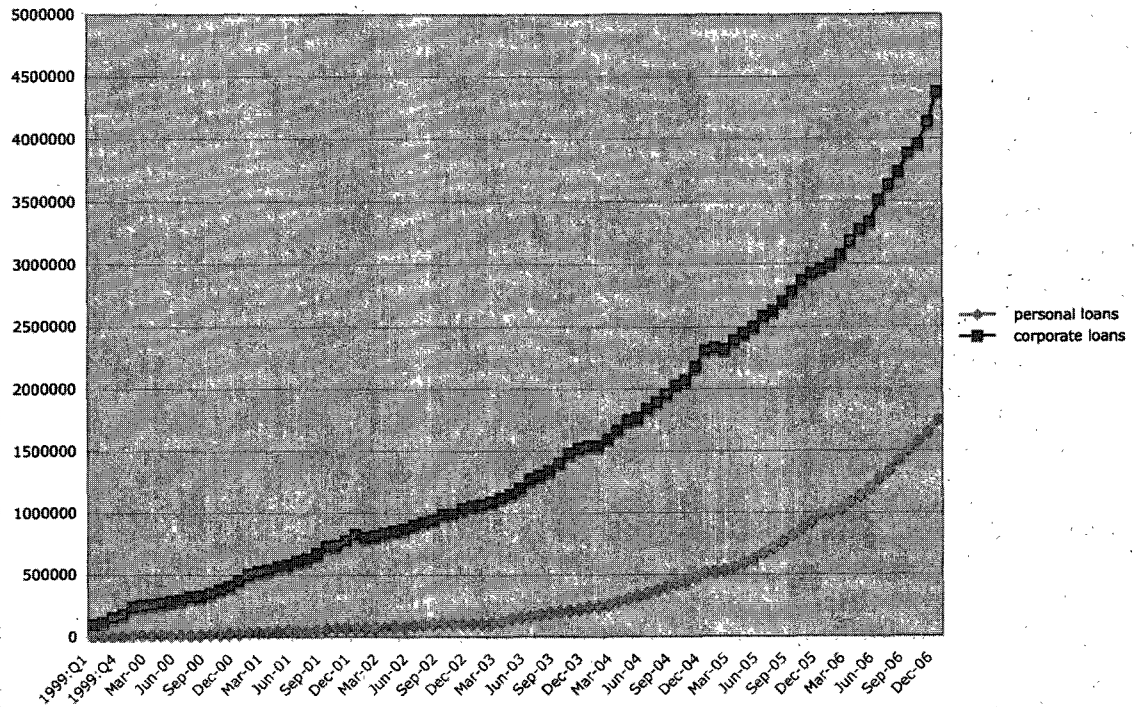
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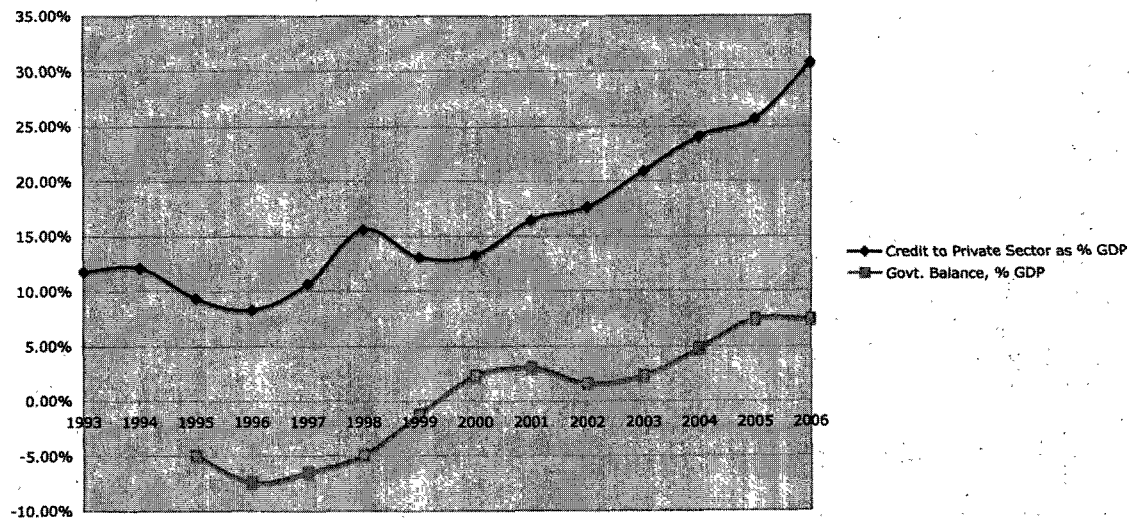
Appendix:

Figure 1: Loans to the non-financial sector



source: Russian Central Bank at www.cbr.ru

Figure 2: Credit to Private Sector and Govt. Deficit as % GDP



Source: calculations based on data from *IMF International Financial Statistics*, January 2008.

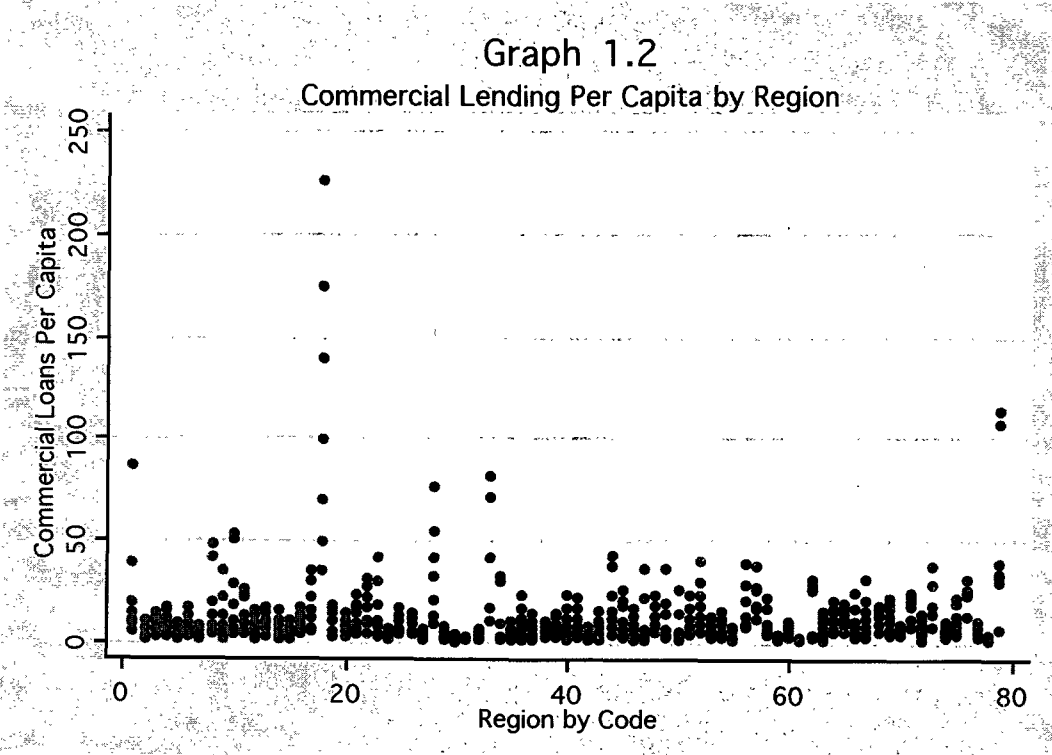
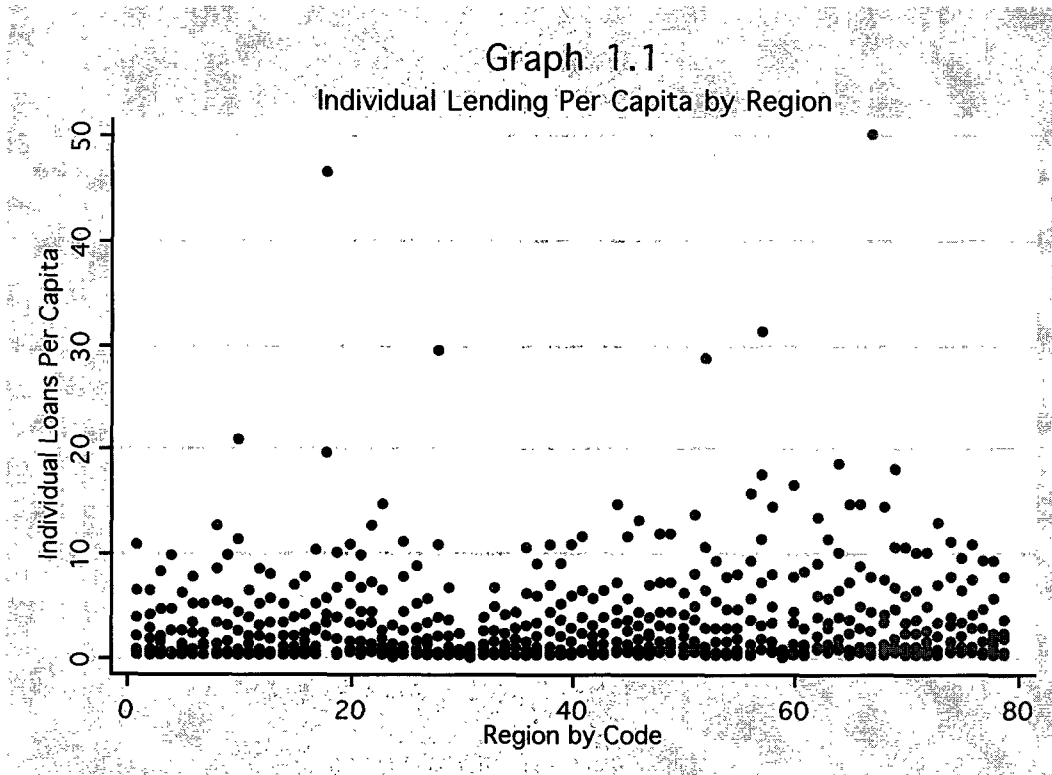
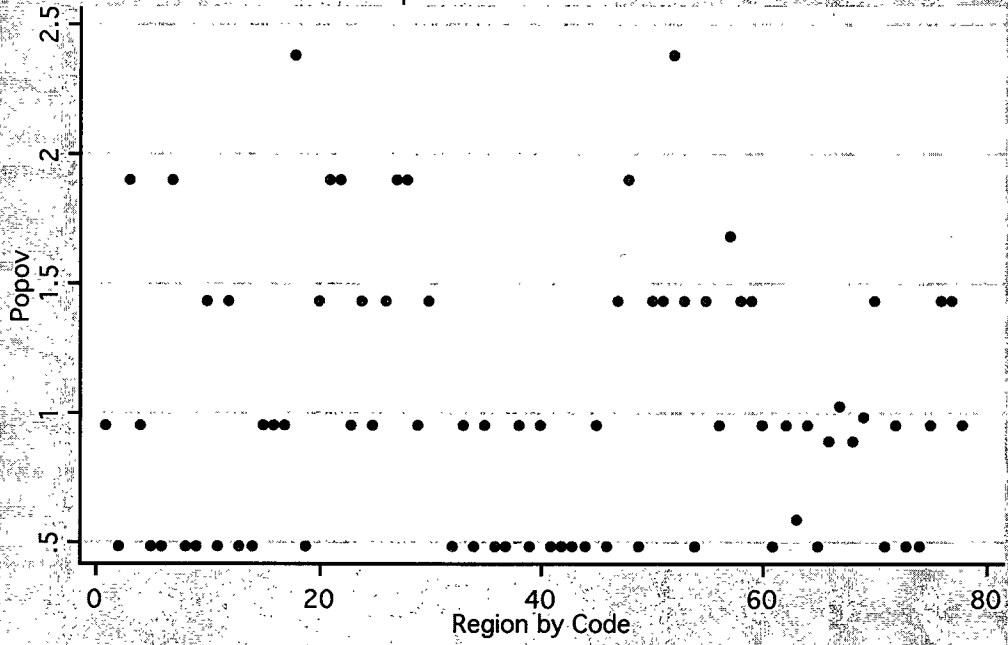


Table 4.1: Summary Statistics				
Concept	Variable	Mean	N	Expected Sign
Commercial Lending Per Capita	cloanspc	8.84	390	
Individual Lending Per Capita	iloanspc	1.415	395	
Bank Penetration	branches	13.91	333	(+)
Overdue Loans	overdue	59874.89	391	(-)
Income	gnp	69435.73	395	(+)
Popov's Liberalization Index	popov	1.019	385	(+)
Slinko et al's Capture Index	capture	0.00304	355	(+)
Residual Institutions	r4	-1.52e-08	395	(+)

Table 4.2: Correlation						
	gnp	branches	overdue	popov	capture	r4
gnp	1					
branches	0.2494	1				
overdue	0.1969	0.1034	1			
popov	0.226	0.3426	0.147	1		
capture	0.0431	0.1676	0.0128	0.119	1	
r4	0.0316	0.0708	0.2958	0.21	0.0254	1

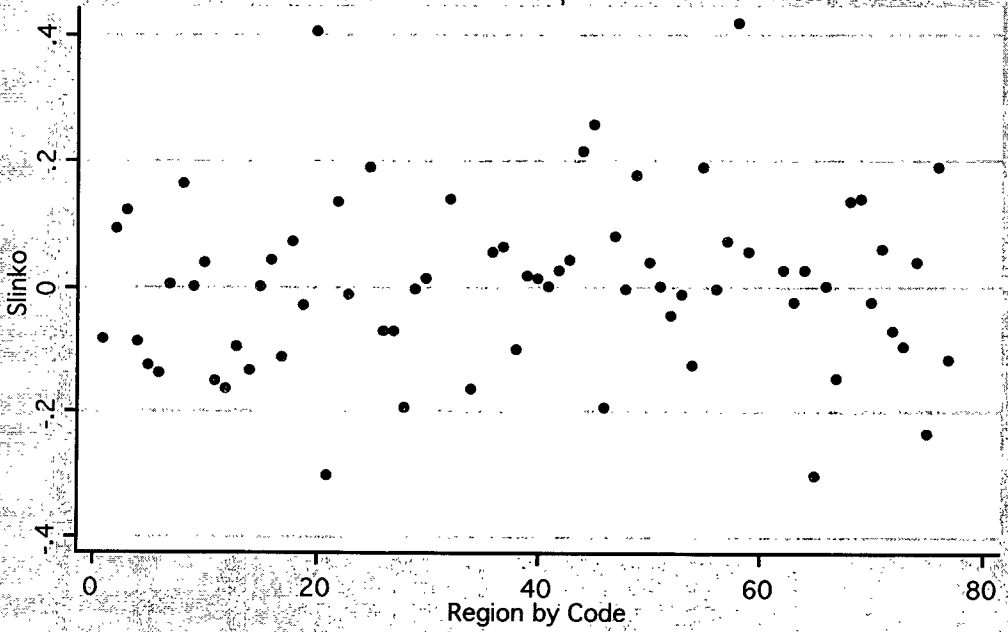
Graph 4.1

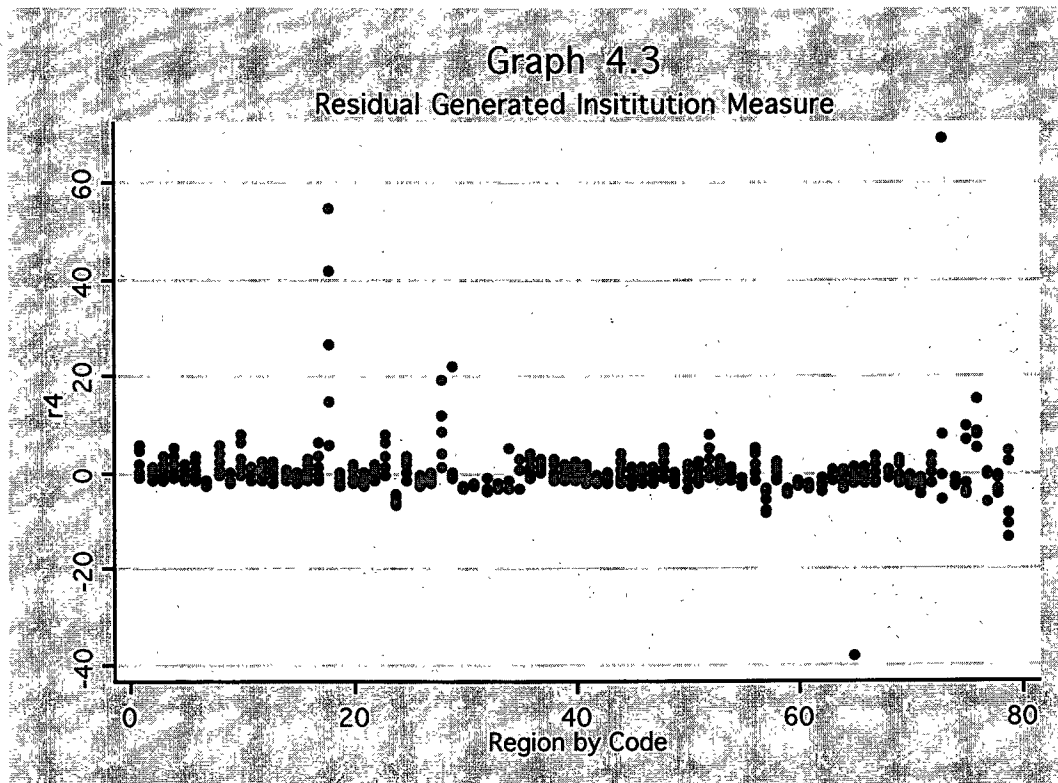
Popov Liberalization Index



Graph 4.2

Slinko et al Capture Index





<i>Table 5.1</i>		<i>OLS Estimation</i>					
Dependent Variable:	Individual Loans Per Capita			Commercial Loans Per Capita			
Variable	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	
Constant	0.543 (3.31)***	0.619 (5.94)***	0.49 (5.28)***	2.053 (2.47)**	4.227 (7.73)***	3.355 (8.16)***	
GNP	0.0000118 (11.92)***	0.0000118 (11.96)***	0.0000126 (13.89)***	0.0000518 (10.28)***	0.0000536 (10.37)***	0.0000603 (14.98)***	
Branches	-0.002 (-0.66)	-0.004 (-1.16)	0.001 (0.50)	-0.076 (-4.55)***	-0.07 (-4.12)***	-0.038 (-2.87)***	
Overdue	3.93E-07 (1.43)	3.82E-07 (1.40)	1.03E-07 (0.40)	3.72E-06 (2.67)**	3.75E-06 (2.62)**	1.42E-06 (1.25)	
Moscow	-0.018 (-0.02)	0.074 (0.10)	-2.839 (-3.62)***	69.746 (18.32)***	71.677 (18.52)***	48.108 (13.87)***	
Popov	0.036 (0.24)			2.234 (2.94)***			
Capture		1.413 (2.64)**			1.545 (0.55)		
r4			0.082 (7.31)***			0.671 (13.59)***	
Observations	324	306	330	323	306	329	
Adj R-Squared	0.3366	0.3556	0.4324	0.6981	0.6945	0.8027	
F-Stat	33.78	34.66	51.13	149.92	139.66	267.9	

(notes: (**)***) indicate significance at the 10%, 5%, and 1% levels, respectively)

Table 5.2:		OLS Estimation					
Dependent Variable	Individual Loans Per Capita			Commercial Loans Per Capita			
Variable	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	
Constant	0.743 (6.42)***	0.601 (5.79)***	0.49 (5.28)***	2.629 (3.50)***	4.151 (7.54)***	3.355 (8.16)***	
GNP	6.91E-06 (9.19)***	0.000121 (12.26)***	0.0000126 (13.89)***	0.0000359 (7.37)***	0.0000548 (10.45)***	0.0000603 (14.98)***	
Branches	0.006 (2.59)***	-0.004 (-1.16)	0.001 (0.50)	-0.047 (-3.07)***	-0.07 (-4.13)***	-0.038 (-2.87)***	
Overdue	-2.45E-08 (-0.10)	3.44E-07 (1.27)	1.03E-07 (0.40)	3.59E-06 (2.31)**	3.63E-06 (2.52)**	1.42E-06 (1.25)	
Moscow	-0.178 (-0.33)	0.014 (0.02)	-2.839 (-3.62)***	68.711 (19.68)***	71.606 (18.45)***	48.108 (13.87)***	
Popov 2001	-0.698 (-5.31)***			-0.867 (-1.02)			
Popov 2002	-0.623 (-4.34)***			1.367 (1.47)			
Popov 2003	-0.242 (-1.78)*			1.879 (2.13)**			
Popov 2004	0.631 (3.96)***			3.12 (3.03)***			
Popov 2005	1.604 (11.20)***			7.351 (7.92)***			
Capture 2001		0.043 (0.04)			-0.38 (-0.07)		
Capture 2002		0.04 (0.03)			1.986 (0.31)		
Capture 2003		0.827 (0.7)			-0.444 (-0.07)		
Capture 2004		4.465 (3.71)***			9.944 (1.55)		
Capture 2005		2.046 (1.65)*			-3.185 (-0.48)		
r4			0.082 (7.31)***			0.671 (13.59)***	
Observations	324	306	330	323	306	329	
Adj R-Squared	0.6722	0.3867	0.4324	0.757	0.6929	0.8027	
F-Stat	74.61	20.73	51.13	112.43	77.46	267.9	

(notes: (***) indicate significance at the 10%, 5%, and 1% levels, respectively)

<i>Table 5.3:</i>		<i>OLS Estimation</i>		
Dependent Variable:	Individual Loans Per Capita		Commercial Loans Per Capita	
Variable	Model 1	Model 2	Model 3	Model 4
_2001	0.553 (0.70)	0.172 (0.44)	5.869 (2.02)**	1.953 (1.51)
_2002	0.633 (0.80)	0.386 (0.98)	7.512 (2.55)**	3.902 (2.97)***
_2003	0.982 (1.25)	0.818 (2.09)**	7.501 (2.58)***	5.912 (4.54)***
_2004	2.102 (2.67)***	2.045 (5.21)***	7.241 (2.49)**	8.949 (6.92)***
_2005	3.144 (3.99)***	3.346 (8.53)***	7.478 (2.57)***	12.779 (9.88)***
_2006	4.195 (5.16)***	5.94 (14.70)***	11.581 (3.85)***	18.071 (13.56)***
_2007	6.129 (7.54)***	11.554 (28.59)***	10.794 (3.60)***	23.077 (17.32)***
Moscow	7.524 (6.09)***	8.478 (6.73)***	99.497 (21.83)***	102.411 (24.66)***
p2001	-0.364 (-0.52)		-3.758 (-1.47)	
p2002	-0.236 (-0.34)		-2.597 (-1.00)	
p2003	-0.163 (-0.23)		-0.945 (-0.37)	
p2004	-0.082 (-0.12)		1.714 (0.67)	
p2005	0.124 (0.18)		4.72 (1.85)*	
p2006	1.57 (2.23)**		5.509 (2.12)**	
p2007	4.96 (7.04)***		10.578 (4.07)***	
c2001		-0.031 (-0.01)		-2.643 (-0.28)
c2002		0.315 (0.11)		-0.612 (-0.06)
c2003		0.867 (0.30)		-0.044 (-0.00)
c2004		1.908 (0.67)		-1.379 (-0.15)
c2005		2.431 (0.85)		-0.033 (-0.00)
c2006		3.604 (1.20)		0.7973 (0.08)
c2007		-0.526 (-0.18)		-7.624 (-0.77)

Observations	531	489	525	486
Adj R-Squared	0.737	0.7133	0.7124	0.7416
F-Stat	100.21	82.11	87.7	93.99

(notes: *(**)*** indicate significance at the 10%, 5%, and 1% levels, respectively)