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Formal External Financing in Transition Economies
An Empirical Study with Focus on Public Ownership

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Abstract

Economic theory states that public firms are less creditworthy due to lower efficiency, and hence are expected to use less formal financing than private firms. In communist countries however, all formal capital was distributed the favored public firms and despite various market-oriented reforms in the transition economies of today, these old structures are expected to linger. Therefore formal credit in transition economies is still likely to be distributed to public firms regardless of their creditworthiness, even though vast differences between the economies are expected, as some are almost fully comparable to developed countries, while others among the world's least developed countries.

The empirical investigation in this thesis is conducted through a binary choice model. The transition economies are divided into three groups depending on their degree of financial and market-oriented reforms. The aim is to discern whether there is a difference in firms' usage of formal external credit depending on degree of reforms on the one hand and to examine differences between public and private firms' usage on the other. The results show that firms in all transition economies experience very similar probabilities of using formal credit, regardless of the degree of reforms. However, a closer look at the composition of firms using formal capital, shows that there indeed are great differences between the countries. Public firms receive significantly less formal external capital than private firms in the most reformed economies. In the middle reformed economies the difference between public and private firms is smaller, and in the least reformed transition economies the ownership variable did not have any significant impact on firms' use of formal credit. We conclude that the differing degree of financial and market-oriented reforms do not affect the overall use of formal credit, but is reflected in the distribution of credit, which is more market-based in economies that have reached a higher degree of transition.

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1. Introduction

As the eastern European countries one by one join the EU and China has become the new global factory, it is obvious that the former communist countries are becoming noteworthy players in the world economy. However, despite of their increasing importance one must not forget that they are still, to a varying degree, struggling with the unique difficulties of transition from planned to market economies, enduring macroeconomic instability as well as a wide range of internal concerns.

Transitioning is a very unique process, and by studying it economists can hope to achieve a deeper understanding of how the validity of economic theories is affected by the contextual framework in which they have been developed. The investigation of less developed countries might prove the presence of different conditions for economic activity and the need for modified economic models. Transition economies are of particular interest in this sense as they have reinstalled the entire system of market economy in a very limited time, sometimes starting with almost no free market activity. This offers economists a unique opportunity to investigate how the development of markets is affected by legal framework and regulatory environment.

In this study we examine how imperfections in the financial markets affect the composition of firms using formal capital. The difficulty individual firms' experience in accessing formal finance for new investments has been identified as one of the major obstacles of growth in transition countries (Beck et al., 2002; Fung et al., 2007; Fazzari et al., 1988). New financial and legal systems are being, or have been, implemented in transition economies but old standpoints from the command economy still linger and make the implementation arbitrary. This often results in inefficient distribution of formal capital: that credit is not allocated to companies primarily on the basis of future profitability, but on other, more subjective, grounds such as networks or type of ownership. Firms, with every chance of becoming profitable, are constrained from growing because of a lack of formal financing while inefficient companies might waste resources (Fazzari et al., 1988). Such problems affect the whole economy negatively and

slow down the overall development and growth, much needed in these countries to ease the transition.

Transition economies, however similar in many aspects, are very diverse, not the least in their financial development and process of transitioning. This is likely to show in the allocation of formal credit and spurs us to investigate whether the degree of reforms: the liberalization of markets and the building of new institutions, affects the usage of formal external credit.

We have chosen to answer two questions in the scope of this thesis and have limited the study to focus on one firm characteristic known to have been of importance in communist countries: public ownership. At a later stage hypothesizes will be formed of the original questions, which are the following:

Are significant differences in firms' use of formal external finance present between transition economies depending on their degree of reforms?

Is the type of firm ownership – public or private – linked to firms' use of formal external finance in transition economies?

1.1 Methodology

This thesis is conducted through empirical analysis using cross-section data from a wide range of transition countries. A binary regression model using variables that cover firm ownership, degree of reforms, and various control variables is formed. The dependent variable is "usage of formal external financing for investments: loans from domestic and foreign banks and the sale of stock". The firm-level micro data is acquired though the

World Bank Private Enterprise Survey (WBES)[1] and includes only for-profit establishments (WB, Screener Instrument). The data was collected in 2005 for all countries, except for China, Cambodia, and Serbia and Montenegro where it was collected in 2003. The difference in the time of data collection is of less importance as the countries are all in differing degrees of transition; the collection was carried out within relatively short time and the macroeconomic factors that might vary between the years are being controlled for. The macroeconomic variables are obtained from IMF, and an index for the rule of law is obtained from the governance indicators in Kaufmann et al. (2006).

The countries included in the study have been identified as transitioning from planned economies according to a definition used by several scholars (se for example Lowitzsch and Pacherowa, 1998 in Falke, 2002; Prokopijevic, 2001; Nsouli, 2003). The degree of transition is measured by the development of legal institutions and financial markets evaluated through the EBRD (European Bank of Reconstruction and Development) transition indicators.

The empirical analysis is conducted through a binary regression model, and the choice of model is based on the fact that our main interest is which firm characteristics are associated with the *usage* of formal capital, and therefore our model only treats the presence or absence of formal finance. The regression analysis will be carried out in a two-step process. First, all transition economies will be examined as a single unit and thereafter they will be divided depending on their degree of reform and re-examined group by group.

In addition to our empirical analysis we have undertaken a thorough research of formal external financing in transition economies and conventional methods for evaluating firms' creditworthiness. This part of the study is based on scientific papers, articles and policy documents.

[1] A large enterprise survey conducted regularly by the World Bank in a wide range of countries. For further information see www.enterprisesurveys.com

1.2 Delimitations and Potential Sources of Error

Due to a limited scope of time and space this thesis can not cover all the interesting areas associated with the usage of formal finance in transition economies but we have had to focus on a few core issues, leaving a large number of questions to others. The thesis has been concentrated to the impact of public or private ownership on the usage of formal capital and subsequently other firm characteristics are present merely as control variables.

We have chosen to investigate if the type of ownership is correlated with the *usage* of formal finance, instead of the *access* to formal external funds. The reason is to minimize the issue of self selection: e.g. if the reason that a firm does not use formal external financing is that it does not *seek* or because it does not *gain access* to these funds. This would otherwise be a severe source of error. In this paper, the problem is further diminished by our choice only to examine how funds for new investments, not working capital, are obtained. Firms that do not seek access to external funds due to no investment needs are thus not included in the sample.

The term formal external capital includes both bank loans and sale of stock in the study. Stock can be issued both through public listing, and outside the public stock markets. The latter type of equity is sold directly through the company and buyers are often acquaintances or business partners of the firm management. As it most often is based on networks, it is not included as a formal source of financing in this study. Generally, stock markets are still largely underdeveloped and sparsely used in transition countries and hence will not receive quite as much attention in this thesis as banks.

This thesis discusses the transition countries listed in appendix 2. A general problem when studying these countries is that most previous research on the area does not include China or the Southeast Asian countries. The authors have often chosen to focus on the former CIS (Commonwealth of Independent States), and sometimes choose to add the Southeast European countries (see for example ERBD; Coricelli and Masten, 2004; Dowling and Wignaraja, 2006). An implication is that data often is harder to find for the

Asian countries and some of our material has had to be collected from less preferred sources. The EBRD transition indicators, for example, do not cover the East Asian countries and complementing material had to be acquired. Furthermore, data for less developed countries, to which many transition economies are counted, is not always comparable to that of other countries and thus some transition economies are not available for research. The countries excluded from this study are: Albania, Armenia, Azerbaijan, Bosnia and Herzegovina, Mongolia, Laos, Thailand, and Turkmenistan.

1.3 Disposition

This thesis is structured as follows: in section two previous research concerning financial development and formal external financing will be introduced and discussed. In section three the theoretical framework: theories about risk evaluation and a discussion about public ownership of firms is presented. The following section continues on this presentation but also introduces and thoroughly treats the subject of transition economies and their specific conditions. From the information in section three and four we form hypothesizes which are to be examined in section five. Section five handles the empirical part of the study, data and summary statistics, the model, and results before the conclusions are drawn in the final section, six.

2. Previous Research

This section summarizes some of the research previously conducted on the connection between financial and economic development on the one hand, and financial development and firms' access to credit on the other. The latter is also introduced in the special context of transition economies.

In a study such as this, one may ask why market reforms of the financial system are of such importance for economic growth and development. Putting aside ideological issues, several researchers have found that a close and significantly positive relationship between financial and economic development exists, although the causality of this relationship is not established (see for example Goldsmith, 1969; in Scholtens, 2000; Levine and Zervos, 1998; Pagano, 1993). Schleifer and Vishny (1997, in Scholtens, 2000) stress that one of the most important features of market-oriented financial systems is that they create liquidity, which in turn reduces investment risk and promotes entrepreneurs which are especially important in transition economies. Koldoko (2002) regards entrepreneurship and a vivid business sector to be essential for increased growth and development in transition economies. Also Bartlett and Bucvic (2001) as well as Smallbone and Welter (2001) recognize this importance, and state that this development is hindered by lack of credit.

A great amount of empirical research has been preformed to more closely study the relationship between legal and financial environments and firms' access to and usage of external capital. Most researchers have found that weak legal institutions hinder access to external finance and hence cause firms to use a lesser amount of it (see for example Rhaguram and Zingales, 1998; Levine, 1998; La Porta and Lopez-de-Silanes, 1998). However, Beck et al. (2002) study a range of different external sources of capital in a very large sample of countries and argue that the interpretation of previous findings is a misunderstanding. Instead Beck et al. show that it is the type, not the proportion, of

external finance that is affected by the financial and legal institutions. Firms in less developed economies, they conclude, substitute the formal external sources used in developed countries, for other sources such as trade credit and informal sources.

Although legal and financial environments impact on firms' access to capital has been studied relatively carefully, the subject in context of transition economies has not yet been covered. Most researchers have only studied single transitional cases, of which the most relevant are presented below. A reason for the scarce cross-country research on this subject is, according to Beck et al. (2002), the lack of firm data for less developed countries. In addition, the existing data is neither always representative for the composition of the economies nor altogether comparable across countries and regions.

Meino (2005) studies large manufacturing firms' investment behavior in Thailand and conclude, among other things, that networks are important to gain access to formal funds and that poor relations between firms and financial institutes affect firms' access to formal credit negatively. Hutchinson and Xavier (2006) compare the impact of credit constraints on the growth of small and medium sized enterprises (SME:s) in two small economies, Slovenia and Belgium, and conclude that financing constraints are larger in the transition country. Ngoc and Nguyen, (2006) study how firms in Vietnam acquire access to bank funds. They have an institutional approach, and in the empirical model they focus on variables such as networking and management concluding that they have significant impact on firms' access to bank funds. Lastly, Filatotchev et al. (2007) study ownership structure and financing sources of large firms in Poland and Hungary. Their findings show that the firm's ownership characteristics, such as ownership concentration and owners' identity – foreign or domestic – is likely to affect which sources of finance are used for investments.

3. Theoretical Framework: Formal External Financing

This section describes the prerequisites for well functioning formal credit institutions and a few theories about financial institutions' measurement of creditworthiness. Furthermore, it treats specific firm characteristics associated with the use of formal external funds, focusing on the role of public ownership.

Across the world, firms planning to make new investments can choose between several sources of investment capital. The conventional sources are divided into internal and external funds; that is funds acquired from within or outside the firm (Beck, et al., 2002; Fung et al., 2007).

Internal sources of credit are considered to be suitable for smaller investments, particularly in young and small enterprises, but as a firm grows and larger investments are required to uphold growth, internal funds do not provide enough credit (Beck et al., 2002; Fazzari et al., 1988). Especially for firms in industries that require large investments in machinery or research and development of new products, thus requiring long time to become profitable, the availability of sufficient external funds is fundamental (Fung et al., 2007). If adequate external financing sources are unavailable for the firm due to very high costs or non-functioning financial markets, firm investments can be expected to depend on changes in cash flow instead of on actual investment demand (Fazzari et al., 1988). In the long term this will hinder investments and only allow those of relatively small scale and short term (Myers and Majluf, 1984). This in turn will restrain the firms' possibilities to grow and increase productivity and can create a situation where companies settle for a size and production level, which is sub-optimal for the economy (Fung et al., 2007; Beck et al., 2002).

External funds are such as trade credit or leasing arrangements; borrowing from banks or other lending institutions; and sale of stock. These funds are usually divided into formal sources, consisting mainly of bank loans and sale of stock, and informal sources, such as

trade credit or loans from moneylenders and loan sharks. Between these categories several vital differences exist (Beck, et al., 2002; Fung et al., 2007). The informal sources of finance are highly unbeneficial to the firm as they are often positioned at the border of laws, and legal enforcement of contracts might therefore be hard to obtain (Cross, 1998). Furthermore, these loans are usually granted on short term and, except sometimes in the case of trade credit, issued to very high interest rates (Todaro and Smith, 2006).

All external fundraising methods, formal as well as informal, are distinctly different from internal sources as they are subject to severe information asymmetries which can cause moral hazards or adverse selection. Trade credit and other sources based on networks minimize the problem as the networks create a situation of repeated games where a dishonest party would loose since no one would want to continue to do business with him or her (Granovetter, 1985). However, when the external financing is based on single games, as is often the case for formal financing, the risk for fraud is large. The problem is usually solved by either carefully selecting the investment objects or making default costly by punishing non-payers. The latter is only possible for formal financial institutes if appropriate regulation, such as business and property laws, is available (see for example La Porta, 1997 in Scholtens, 2000; and Levine 1998).

3.1 The Role of Regulations

Legal systems protecting creditors' rights and enforcing agreements have been found to promote high-quality financial systems and many scholars argue that sound legal institutions and financial regulations are fundamental for well-functioning banks and stock markets (La Porta, 1997 in Scholtens, 2000; and Levine 1998).

The banking sector is built up on a double interaction, with the bank being the intermediary; collecting funds from the depositors and distributing them to firms and investments. This is an efficient way to allocate credit as lending is associated with large advantages of scale; it is more effective for one institute, specialized in lending, to evaluate and monitor a large number of firms applying for credit than it is for individual investors. Furthermore, a bank can diversify its lending projects, which reduces the total risks. However, to convince savers to place their capital in banks, regulations and law enforcement must guarantee their rights by ensuring that contracts are written and upheld and that depositors receive returns (De Servigny and Renault, 2004).

Sale of stock, is the financing method most dependent on a proper institutional framework to function. Formal regulations must ensure dispute resolution, contract enforcement, and the punishment of violations, such as corruption or self-trading. Also transparency, both of the firm and of the stock market, is necessary to decrease risks of corruption and misuse of investors' assets and to increase the reliability of the regulations (FEAS, 2001).

Access to public equity markets is granted by listing, a process considerably more restricted than acquiring bank loans. The need of restrictions arises due to extreme information asymmetries originating in low access and high costs for investors to acquire information of the individual company (Mieno, 2005). Investors usually own stock in several firms and might change his/her holdings quite frequently. Subsequently each investor can not be expected to have the time and means to go through all the records of each firm in the same way as would a bank. Hence, investors must be able to rely exclusively on the statements of financial intermediaries: that financial statements are audited by a reliable accountant, ratings of companies are objective, and that newly listed firms fulfill the requirements for listings (FEAS, 2001; Scholtens, 2000). The extensive listing requirements vary between different stock markets but include reliable and clear books for several years before the public listing and clear records of all assets and liabilities (Pistor and Xu, 2005).

Furthermore, each shareholder usually owns small shares of stocks in many companies. Being a minority shareholder is generally a very risky business as there is a substantial threat that the majority shareholders will override the interest of the minority. Securing the rights of minority shareholders is therefore yet another important role of regulations on the stock market (FEAS, 2001; Scholtens, 2000). Clearly, equity markets are dependant on a sound legal environment, as well as law enforcement that puts these regulations into action (Rockinger and Urga, 2000). Lack of adequate laws can lead to high degrees of ownership concentration and/or small and restricted stock markets (La Porta and Lopez-de-Silanes, 1998, in Scholtens 2000).

Even if adequate and well functioning financial regulations protect the lenders' or investors' rights, the information asymmetries, and hence the vast risks connected with providing credit on the formal external credit markets remain. Therefore it is necessary that the financial institutions also have access to well functioning systems for measuring creditworthiness, who to confide with funds, which will be discussed in the next section.

3.2 Measuring Creditworthiness

When lending or investing the creditor must always take the risk of default, e.g. not to regain the credit, into account. The total default risk is made up of a combination of market risk, operational risk and credit risk (Bank for International Settlements, 2001). Half of the total risk is made up jointly by market risk, which is the risk of changes of factor prices, exchange rates or interest rates, and operational risk, losses due to internal failures or problems. The other half is constituted of credit risk, the risk that the borrower is unwilling or incapable of repaying the debt, and constitutes about half of the total risk for a large bank (Kuritzkes et al., 2003). As credit risk constitutes the main, and the most varied, part of the total default risk, it is also the main concern of the bank when evaluating creditworthiness, while investors on the stock markets base their decision not

only on default risk but on expected profitability as well (De Servigny and Renault, 2004). The following section about measuring credit risk is thus applicable foremost to banks' lending decisions, but is also important to understand the ratings of creditworthiness done by external agencies, for buyers on the stock markets.

Evaluating creditworthiness is an essential part of risk management, but measuring credit risk and predicting default is very difficult, mostly because default is so rare and seemingly can happen to the most diverse enterprises. There are several ways of managing and measuring risk: traditional expert systems and a wide range of more standardized systems (Allen and Saunders, 2002). Below common features and examples of both expert systems and standardized systems are presented.

3.2.1 Expert Systems

Expert systems are the traditional way to evaluate creditworthiness used mainly in banks where a local bank official judges whether the individual firm may borrow or not. These systems are several individual sets of rules of how to evaluate a firm, based on learning by lending. Hence lending decisions are dependant on the bank officials' personal knowledge and experience in lending which causes the system to be highly subjective. Most often the bank official scrutinizes a range of factors which indicate different risk zones, as in the very common system presented below (Allen and Saunders, 2002).

Factors determining firms' creditworthiness:
Character: a firm's reputation, its readiness to repay, and its repayment record. Age is often used as a proxy for character.
Capital: if the leverage is high and contribution of the owners own capital is low the bankruptcy probability of a firm is high.

Capacity: the borrower's capability to repay can be measured by the predictability of the earnings. If the earnings do not come in a constant flow it is likely that the firm will experience future difficulties in repaying dept claim.
Collateral: If the creditor is guaranteed valuable securities the risk of default is lower.
Cycle Conditions: The state of the economic business cycle is an important predictor of a firm's performance, particularly for firms in cycle dependent industries.

Other expert systems emphasize the importance of an accurate level of the interest rate on the loan. Too high or too low levels can cause adverse selections of borrowers, which in turn can affect the expected repayment of loans negatively. If the rates are too low borrowers have little to loose and moral hazard can tempt them to shift credit to riskier projects with potentially higher returns. If, on the other hand, the interest rates are high, adverse selection would cause good borrowers to leave the market and shift to internal finance. Only firms with low profitability and hence high default probability would stay and thus the expected repayment of loans would be below its maximum point. However, basing loan decisions on inspection of the interest rate level results in decisions flavored by the bank official's personal opinion, as the optimal interest rate is different for each lender and impossible to determine (Allen and Saunders, 2002).

The specific factors the used by individual bank officials to determine whether to issue a loan or not, are uncountable and can vary from case to case. Also the bank official may assign different weight to each aspect when he or she determines who to grant a loan, making the system yet more subjective. Basically two officials evaluating on the basis of the same factors can present opposing decisions on whether or not to lend to the same firm (Allen and Saunders, 2002). This makes coordination of risk judgments, necessary to ensure consistency in the bank policy, almost impossible (Guseva and Rona-Tas, 2001).

Even though experts traditionally were the chief evaluators of creditworthiness in banks, risk experts nowadays often only play a minor part in the decision making process. To decrease the subjectivity and inconsistency more standardized systems have developed (Allen and Saunders, 2002).

3.2.2 Standardized Systems

Today more standardized systems are used by banks and credit rating agencies that monitor listed firms. These systems have gathered knowledge of the top human experts with the main goal to make evaluation of creditworthiness consistent, at least within each credit institute. There is a range of standardized systems which all have in common that they are based on the existence of reliable firm data. Computerized systems measure risk by repeated sampling of inputs and outputs in lending, credit scoring systems are based on econometric techniques, and internal/external credit rating systems evaluate performance (Fatemi and Fooladi, 2006).

In internal and external credit rating systems the financial institute, whether it is a bank or an external credit rating agency, rates the qualities of the applying firm, such as business credit, leverage, asset quality, and liquidity, according to a fixed scale. The evaluation of creditworthiness is based on this type of performance-oriented measures used in all rating systems, but the relative weight given to each factor can vary considerably between different banks or agencies (Allen and Saunders, 2002). Institutes try to make their grading consistent over time, between industries, and regions but in the end a certain amount of appreciation is included in the rating. Whereas banks rate firms to simplify the lending decision, external credit ratings are performed by agencies to "provide an independent credit opinion" (De Servigny and Renault, 2004, p23). They play an important role, especially on the securities markets, but stress that their work is merely opinions, not recommendations (De Servigny and Renault, 2004).

The Basel Committee on Banking Supervision has issued several recommendations on banking laws and regulations with an aim to, among other things, strengthen and increase the compatibility of the credit risk measurement systems world wide. They advocate certain credit risk measurement models, focusing on firm performance and profitability to discern the creditworthiness of enterprises. Their systems are mainly based on internal or external credit rating with standardized weights and have specific routines for analysis and reporting (Bank for International Settlements, 2001). To enable and uphold high-

quality credit risk measurement systems, the Basel Committee also stresses the importance of a wide range of issues within banks, such as well-functioning management information systems, regular internal inspections, and qualified staff members that can be held responsible for their acts. The Basel recommendations set a global standard for credit risk measurement but have been criticized as they are considered to be not altogether easy to follow. Large banks in countries with a history in risk management have a considerable advantage and may increase their head-start. Poorer and developing countries where no large banks are present will lag behind as will countries where banks have pasts of distributing credit according to governmental or social aims (Beaumier, 1999/2000).

As the possibilities to use standardized systems might be restricted in some regions or countries we will now turn to look at an aspect of the expert systems: firm characteristics as indicators of creditworthiness, with the example of public firms.

3.3 Firm Characteristics as Indicators of Creditworthiness

Although purely external firm characteristics such as size, age, or ownership of the firm may are vital in the expert systems, they seldom play an important role in standardized systems. Furthermore, the credit risk measurement systems recommended by the Basel Committee, eliminate such characteristics to be used as default predictors. Nevertheless, clear links indeed do exist between expected firm profitability, default risk, and certain firm characteristics. Small and young firms, for instance, are associated with high risks caused by for example small market power, insufficient management skills, large information asymmetries, and lack of assets (Le et al., 2006; Ngoc and Nguyen, 2006; Hyytinen and Pajarinen, 2007). Sometimes also the sector or industry the firm is operating in is an indicator of the future firm profitability as some sectors are expected to

boom while others have stagnated (Le et al., 2006). Other reasons why some types of firms may be less likely to be granted formal financing are because they have less firm data or less clear books. Small firms, for instance, are less likely to have clear records, and in countries, regions, or sectors with extensive corruption many firms keep double books and unclear records which makes them obscure regardless of their size (Fazzari et al., 1988). As such firms' creditworthiness is very hard to measure the risks of misusage are high and they are less likely to use formal credit (Allen and Saunders, 2002).

We will now turn to look at the specific circumstances concerning one of these important firm specific factors, the role of public ownership, and its expected effect on creditworthiness.

3.3.1 Public Ownership

State-owned enterprises (SOE's) exist in virtually every country, though to a varying extent and for varying causes. Typical areas where public enterprises operate is in public goods sectors; where payment is hard to collect and private enterprises may find it too hard to obtain profit, or in natural monopolies; where the entry costs are high and significant advantages of scale are present; such sectors are for example electricity, defense industry, or railway networks. It is possible, and in some cases not even uncommon, for private enterprises to be present in these sectors, but it is less common that public firms act on markets of purely private goods (Rosen, 2002). However, this type of for-profit SOE's might be present if the market is considered to be of national interest, such as the state monopoly on alcohol in Sweden and Norway.

Depending on, for example, historical and demographical factors, preferences concerning the tasks and sizes of individual public firms, whether they are for-profit or not, and the magnitude of the entire public sector, vary vastly across the world. A country with a

traditionally weak central government and few state enterprises, such as the U.S.A., might assign even traditionally public matters, such as schooling, to the private sector. Conversely, states with a very large public sector, such as China, might even have state owned department stores. Even if one chooses to only compare developed market economies, large differences are present: European countries usually have much larger public sectors than do the U.S.A.

In general, however, public and private firms act on different markets and therefore face different business conditions regarding competition, demand, or trends. Public firms often face less competition, as they commonly act as monopolies or oligopolies. Companies with market power are not as efficient as firms operating under perfect competition and hence SOE's are less efficient relative private firms (Dixit, 2000; Maskin and Xu, 2001; Oman et al. 2003). The result is often a relatively weaker performance and lower profitability.

Furthermore, the public ownership itself results in a couple of problems. Firstly, as the manager in a public firm does not own the firm or have any natural incentives to make it prosper, principal-agent problems can be severe. There is a significant risk that the agent does not carry out the actions or reforms best suited for the firm as these may require additional work or personal disadvantages. Instead it is likely that the manager chooses to maximize his or her own benefits, such as power or career goals (Dixit, 2000). The principal-agent problem is present in large private corporations as well but in general they have proved more efficient in providing extra compensation and other incentive enhancing measures, such as performance-based provision or bonuses, for good management (see for example Dixit, 2000; Oman et al. 2003).

Secondly, the public ownership also often results in soft budget constraints becoming an issue. The term *soft budget constraints* was first introduced by Janos Kornai addressing the fact that the state rarely lets a poor SOE go bankrupt without having helped it at several occasions with extra loans, or bailing it out of old debts (Kornai et al., 2003; Lin and Tan, 1999). As firms are usually publicly owned by political reasons they are

generally assumed to contribute to the state with a social benefit larger than the economical value of the establishment. Therefore it is expected that governments world-wide try to save public firms from bankruptcy. Also, representatives of the SOE's are likely to emphasize this social benefit to increase the likelihood of help from the government even more (see Kornai et al., 2003). The consequential problems are obvious: the firm becomes less cautious with its balance sheet and less efficient, which results in lower performance and profitability (Lin and Tan, 1999). On the other hand, the lender or investor can hope for the state to bail out the company if it fails to fulfill its duties, thus regaining lost funds. Still, this is merely a faint consolation for the lender, as such an event results in that repayment is delayed and the government may also only repay a part of the amount (Lin and Tan, 1999).

Summing up: state owned enterprises are less efficient and therefore have less expected profitability relative private firms. There are however factors that imply relatively low credit risks that might persuade creditors to lend to, or invest in, SOE's; such as their soft budget constraints and the low risks of bankruptcy (Lin and Tan, 1999). All in all, SOE's are not as creditworthy as private firms in general.

4. Transition Economies

This section defines the term transition economy and describes the past and present of formal external financing in these countries. To highlight the characteristics of the financing sources, transition countries are continually compared to developed, as well as developing economies. We also look into the conditions of public firms and outlines their particular conditions. The section is concluded with summary hypotheses.

Traditionally the term "transition economy" has been used for the Central and Eastern European states since the end of the Soviet era. More recently other former communist countries have often been included in this definition and also several East Asian countries are usually often referred to as transition economies. Some of these, as Vietnam, are still formally communist but are transitioning in an economical sense (Mickiewicz and Zalewska, 2005).

The term transition in this context refers to the intermediate status when a country evolves from a command economy to a market-based economy (Lowitzsch and Pacherowa, 1998). According to Prokopijevic (2001, p5) "transition consists – basically but not exclusively – of a threefold move: from dictatorship to democracy, from the rule of one party (man) to the rule of law, and from a planned to a market economy." This movement is represented by the creation of institutions and structures, especially concerning private enterprises and the role of the state. As this is hard to achieve reforms have generally been most advanced in the privatization of small-scale enterprises and to a slightly lesser degree in the liberalization of prices and foreign trade. Reforms requiring the building of new institutions and the change of attitudes, such as in the banking and financial sector, have been least advanced (Nsouli, 2003).

Transition economies can be at very different levels of development and national income. Some, such as China, are ranked among the world's most successful economies in terms

of growth rate, while others are struggling against poverty or wars for their survival, as Cambodia. The wealth and economic situation of a country is not mainly a question of the progress of transition but one of the overall business environment and successes of markets (WB, 2002a). Consequently, although the degree of transition and a country's economic progress affect each other, the one does not necessarily determine the other.

Despite their differing macro economic situations, transition economies have some unique features in common which clearly distinguishes them from developed and developing countries. According to Falke (2002) transition economies usually have the following characteristics in common, relative other countries:

- Strong governmental interference in markets and other participant activities.
- Weak private property rights while extended state ownership rights.
- Domestic markets are regularly shielded from international competition and the domestic competition is weak.
- Lack of sufficient institutional infrastructure.

In a typical transition economy, firms can be distinctly separated across sectors and legal statuses. The difference between old and new companies is often large, particularly since old firms almost always are publicly-owned, while new firms are mostly private. This can be related to their factor productivity and economic performance: "New enterprises are expected to be more productive than restructured enterprises, which are expected to be more productive than old enterprises" (WB, 2002a). As transition progresses this connection weakens and variation in productivity will depend less on such historical factors.

One of the most debated issues concerning the definition of transition economies is where transition ends. The same data can give different conclusions on whether a particular country is still a transition economy or not, depending on who gives the verdict. Janos Kornai argued that the transition from command to market economy in Central and Eastern Europe was already over in 1999 as "the system is now a capitalist one" (in Brown, 1999, p.100). The full transformation in institutions and attitudes was on the other

hand lacking. Kolodko takes the other standpoint and means that there can be no specific point when transition is over "as far as sustained growth, integration into the global economy, and the construction of a civil society are concerned" (in Lavigne 2000, p482). Lavigne (2000) argues that such an endpoint indeed does exist, not as early as Kornai suggested, but when these countries are allowed to become members of organizations such as the EU or the OECD. Koldoko does acknowledge that these memberships may be a formal proof that the international community accepts the country as transitioned, but only with the additive that the countries will still have a long way to go to complete the process of becoming market democracies (Lavigne, 2000). Finally, the World Bank means that transition is over when the distinguishing characteristics of transition economies, i.e. the differences between old and new sectors, are gone and the "economic issues and problems policymakers must deal with are no longer specific to transition" (WB, 2002a). Whether they are still formally transition economies or not, most scholars agree that none of the former communist countries are completely done in the process of transforming to regular market economies. Too many structures from the socialist past linger and affect the political, as well as the business environment.

For long it has been possible to divide the group of transition countries into subgroups depending on the magnitude of their reforms. At first one could distinguish between, on the one hand the pending EU members, and on the other the former Soviet countries together with the former Yugoslavia and Albania (Lavigne, 2000). There was, and is, a clear difference in development between these two groups; the former having more or less reached macro economic stability though structural changes are still to be done, while the latter has not. Lavigne argues that a prospective EU membership is not only an approval of the reforms that have been done in this group of countries, but also a source of motivation for reforms and systematic change that have increased the efforts (Lavigne, 2000). In the latter group the remaining problems from the communist era and the forming of new states overshadowed the need for economic restructuring (Lavigne, 2000). Today generally, the second group is divided into two, with countries such as Russia in the middle group, while countries with significant governmental interference or

security or stabilization problems are in the third group (UN, 2003; Falke, 2002; WB, 2002a).

This division of transition economies is very valuable as one turns to look at the economic conditions in transition countries.

4.1 Formal External Financing in Transition Economies

To understand the financial sectors in transition economies one must first be aware of how the socialist past has flavored the present situation. Therefore, a short background to the financial systems will be presented before turning to the formal financial markets of today.

During the command era even the most basic principles of economics as we know it, the role of prices and profit, were different. Prices had nothing to do with supply or demand, in fact supply had no connection to demand, and due to the large excess demand that arose planned economies were often referred to as "shortage economies". In a similar way efficiency, or good management was totally unnecessary as salaries, rewards and punishments had weak or no link to the establishment's profit (Hedlund, 1996; Wessel, 1992). Consequently, when the communist economies started opening up, knowledge of how markets function was virtually unavailable (Le et al., 2006) and particularly scare in countries that had had a command economy for a long time or that had experienced large losses in population, such as Russia and Ukraine (Wessel, 1992; Prokopijevic, 2001; Hedlund, 1996). In those countries almost no people living during the pre-communist era were still alive at its downfall. In contrast the Central European countries, Poland, Hungary, and Czechoslovakia, had a relatively short period of command economy and

were never totally collectivized (Wessel, 1992). Keeping this background in mind, we will now return to the issue of formal external financing in transition economies.

Financial institutions have proven to be one of the most difficult areas to reform in transition economies; after 15 years or more of reforms, the transition economies of today still lag behind in their financial development compared to other countries with similar per capita incomes. This is the case even in the most reformed transition economies, which in other areas may very well be regarded as developed countries (FEAS, 2001). However, the reader of this thesis must keep in mind that the situation usually varies greatly; obviously the circumstances are not the same in the new EU countries as in the countries plagued by conflicts or very low development. In this study we treat the average transition country when nothing else is mentioned.

Bank funds for lending are generally still scarce in transition economies, the methods for distributing them poor, and the stock markets are small or non-existent. Overall, the financial markets and systems are unorganized and the competition among lending and investment institutes is poor even though it has increased (Scholtens, 2000; Rockinger and Urga, 2000). From this it is clear that transition economies in general are relatively underdeveloped financially, and the differences between the financial systems in transition economies and those in the 'ideal', i.e. developed, country are striking. One may instead argue that the description above more resembles the financial situation in many developing countries (Todaro and Smith, 2006). However, the financial institutions in some transition economies, for example Poland, are unquestionably superior to those in most developing countries. Consequently one can, yet again, conclude that there are vast differences within the group of transition economies. Financial markets can resemble both those in developing and in developed countries, but still have their own common distinguishing features due to the communist past.

The financial institutions in developed countries have evolved during long time on a trial and error basis and have formed a complex set of rules, institutions and practices, distinctive for each country. During the early nineties, when most transition countries

started opening up to the west it was a common belief, in the west as well as among most transition economies, that this lengthy process could be skipped by importing a suitable financial system (see Pohl and Claessens, 1994; Smith and Walter 1993; in Scholtens, 2000). The market systems for formal credit in transition countries were subsequently imported and implemented from a blueprint (a striking exception from this is China). However, direct import of institutes proved to be very difficult; a good reputation for the stock markets, and investors' trust in markets and regulations is for instance essential, but can hardly be imposed (FEAS, 2001; WB, 2002a). This problematic background of more or less successful blueprint implementations is one of the common features between transition economies and developing economies. In the more reformed transition countries the implementation process has come further, while the less rapid countries still might be struggling with reformation, or implementation itself, of laws and policies.

The problems of the financial systems in transition economies result in that firms use a relatively small proportion of formal external financing and that informal sources of credit instead have an increased role, especially for small and medium sized enterprises (Gronkiewicz-Waltz, 2006; Mieno, 2005). This is yet another characteristic shared by transition and developing economies and that distinguishes them from developed economies. Firms in less developed economies use retained earnings as far as possible, before asking friends and family for funds or using their networks to obtain trade credits. When these possibilities no longer are advantageous and firms in developed countries would apply for bank loans, companies in transition countries often have to turn to moneylenders or loan-sharks that charge interest which in worst case is higher than the expected returns. This weight of the informal sources of finance is fully in line with the findings of Beck et al. (2002), discussed earlier in the thesis; that financial development does not affect the *share* of external funding used by firms, but merely the share of *formal* finance used. Even for firms that actually acquire bank loans or issue stocks, retained earnings remain a main source of finance longer than in developed countries. The reasons are the high risks and costs of the poorly functioning formal credit markets (Mieno, 2005).

Below, the background to these shortcomings is discussed by first presenting historic overview and distinguishing features of the special sources of formal financing in transition economies. Thereafter the subject of credit distribution in these economies will be handled.

4.1.1 Banks

In the command economy, banks' main task was bookkeeping of state credit and passively maintaining savings accounts and providing loans to firms, not distinguishing between profitable and unprofitable companies (Gronkiewicz-Waltz, 2006). Loans were granted to SOE's on the basis of centrally planned investment priorities and banks neither evaluated creditworthiness nor considered credit risks as not even banks themselves were very concerned with profit (Lindbeck, 2006). Firms could only hardly go bankrupt and as creditor rights were poor this resulted in that the repayment of credit was negotiable (Gronkiewicz-Waltz, 2006; Fries and Taci, 2002). Failed loans were covered either by the government, the central bank, individual banks, or sometimes by trade creditors themselves (Wessel, 1992). Subsequently, at the start of reforms, the banking systems were in a bad state, with many non-performing loans to SOE's, low ratings of savings, and unprofessional staff and management. Even in the few countries, for example Poland, which had opened up the banking sector for competition, the financial institutions were in great need of liberalizations (Gronkiewicz-Waltz, 2006; Ping-Ngoh Foo, 2005). Fries and Taci explain: "While cement companies could still produce and sell cement, the services of socialist banks were of little use in a market economy" (2002, p1).

During the command era, the banking systems were based on an overall governmental banking organisation that controlled all individual banks, in a so-called monobank system. Often banks were divided into branches responsible for different sectors of the economy, for instance, agricultural banks located on the countryside and responsible for loans to the agricultural sector. This system disappeared quickly as transition took off and

universal banking was generally soon allowed (Wong and Wong, 2001; Hedlund, 1996). The banking systems developed rapidly and banks' lending funds grew fast as there were few other alternatives for saving. In the initial stages of the transformation, this coincided with a lack of banking regulation which led to, among other things, undercapitalized banks. In turn, this resulted in extensive lending policies and subsequently in large in losses (Gronkiewicz-Waltz, 2006).

Since then banks have made enormous progress, especially in the more reformed countries, and have in most cases, become modern and competitive institutions. Despite this, however, they are inevitably influenced by their past and still lack in maturity and efficiency; long-term funding is scarce and enforcement is not yet fully developed. The banking sector is, according to Gronkiewicz-Waltz (2006), subsequently not yet in any transition economy fully comparable to those in developed countries.

In less developed transition economies the banking institutions are generally very similar to those in developing countries and in both types of countries a very large share of the banks are constituted by more efficient and market-oriented foreign banks (Hasselmann, 2006; Todaro and Smith, 2006). The largest difference between transition and developing countries lies in the location of banks and the historical remains. In developing countries commercial banks are generally new and only available in large cities (Todaro and Smith, 2006), but in comparable transition economies, the existing domestic banks, either public or privatized, stem from the socialist era and are available in smaller towns as a consequence of the branch-policy of the monobank system (Scholtens, 2000).

4.1.2 Stock Markets

During command economy, stock markets did not exist (Chow and Yiu, 2000; de Haas and Peters, 2006). Usually they were implemented from a blueprint as the transition begun, often after pressure or persuasion from international economic institutions

(Scholtens, 2000; Ping-Ngoh Foo, 2005). The implementation proved difficult, especially for some countries as the basic conditions needed for stock markets - a solid firm base to invest in, macroeconomic stability, and policy credibility - often did not exist at the time the systems were installed. If they do not exist, stock markets may increase the volatility of the economy due to speculation, and become a burden to the country. This in turn lessens the overall importance of stock markets since few potential investors are willing to accept the large risks of investing (Todaro and Smith, 2006).

Even in the few transition economies, such as Russia, where the stock markets were initially important in the privatization of SOE's, they have hardly grown since (Rockinger and Urga, 2000). This observation is consistent even though the methods of distributing revenue and executing privatization through stock markets differed; in Poland for example all citizens received shares of the privatized firms (Wessel, 1992). Still, as most people had problems fulfilling their basic needs, they sold their shares to a low price, hence the expected immediate importance of stock markets never materialized (Davis, 2001).

Equity markets today are generally still small and quite insignificant as a source of investment finance (Chow and Yiu, 2000) to a large extent due to the lack of regulations and implementation of laws (FEAS, 2001). The investor protection, especially for minority shareholders is generally low and law enforcement is poor; there are often few means of controlling or punishing self-dealing or other violations (Scholtens, 2000; Rockinger and Urga, 2000). This resembles them to the stock markets in developing economies, the latter also having been imposed from blueprint. Compared to developed countries the stock markets in transition economies are commonly underdeveloped, unstable, and highly risky. Not until in a late stage of transformation they have proved to be a reliable source of funds and the situation in the Central European countries is indeed relatively better (Mumssen, 2000; McMillan and Woodruff, 2001).

We now turn to the issue of credit distribution; the fact that transition countries lack adequate and properly functioning private and public institutions for regulating finance

also cause the ways of managing risk and evaluating credit to be unconventional or arbitrary (ERBD, 2007; Falke, 2002).

4.1.3 Distributing Credit in Transition Economies

In the communist era, the question of creditworthiness did not exist as all lending decisions were taken at government level and based on state policies (Hedlund, 1996). When these economies started opening up there was consequently no knowledge of how to decide which firms to invest in or lend to. The lack of efficient regulations, experience, and above all, reliable firm data ruled out the standardized systems to measure credit risk (Le et al., 2006). Instead bank officials had to try to lend funds after their own perceptions of which firms were creditworthy, using expert systems. However, after the long years of command economy, it could not be expected that bank officials or policy makers would immediately know how to measure expected profitability, manage risk, or even to understand the concept of profit. In addition commercial banks had scarce funds to lend and were forced to ration them; usually credit was almost exclusively distributed to established and hence state-owned firms (Todaro and Smith, 2006; Scholtens, 2000).

Even though bank funds have increased in many transition countries due to continuously high risks, lending continues to be relatively one-sided, focusing only on short and medium term loans and access to bank credit is still limited. Loans are often issued on terms inapplicable to small firms or large investments, and in some countries state directed loans still occur (Oman et al. 2003). The result is that important small scale firms and entrepreneurs do not have access to formal credit, regardless of their expected profitability or performance (Todaro and Smith, 2006; Fung et al., 2007; Dollar et al., 2003). This points towards that most banks in transition economies may still use expert systems to measure risk, which by no means equalizes them; expert systems are

extremely subjective and can not be generalized about (Allen, and Saunders, 2002; Fatemi and Fooladi, 2006).

Standardized methods of evaluating creditworthiness are preferred by lending institutes but provide many difficulties to the implementation in less developed countries. The standardized countries often require technical solutions that might not be available in the more poorly developed transition economies (Guseva and Rona-Tas, 2001). It goes without mentioning that educated bank officials are necessary for a functioning bank sector, but for example in Cambodia, one of the worlds least developed countries, virtually no educated people survived the years of Pol Pot and hence eligible bank officials are still hard to find (Godfrey et al, 2000). Furthermore standardized systems require qualified and reliable firm data which is often not available because of unclear, double, or even non-existent, bookkeeping (Johnson et al, 2000; Guseva and Rona-Tas, 2001). This is in line with the criticism of the Basel Banking Committee's recommendations, presented above (see 3.2.2): the standardized systems to measure creditworthiness they advocate are difficult for less developed countries to implement (Beaumier, 1999/2000). As if these problems were not severe enough, it has not been unusual that conservative bureaucrats have had an adverse attitude towards change (Hedlund, 1996; Li, 1998).

Sale of stocks is in transition economies an extremely rare way to acquire funds for investments. As the regulatory framework is weak, public listings can be arbitrary and are not seldom subject to political censorship. They also often suffer from high entry fees or special requirements so that only firms from certain sectors or SOE's have actual access (Mieno, 2005; FEAS, 2001). Furthermore, transparency is often a severe problem both within firms and credit rating agencies on the stock market and risk measurement is hence subjective. Evaluation of listed firms is often made on other basis than firm performance deteriorating prospective investor's confidence in the stock market (FEAS, 2001).

In transition economies many firms find formal external credits hard to obtain, regardless of their performance, and simultaneously external factors with no direct link to performance: size, age, and legal status, have proven to be significantly correlated with the use of formal credit (Mieno, 2005; Ge and Qiu, 2006; Ngoc and Nguyen, 2006). This points towards that neither the Basel Committee's recommendations nor other performance-orientated standardized systems to measure creditworthiness are followed. Instead the traditional expert systems still seem to be widespread and as they are highly subjective the allocation of credit can consequently be expected to be flavored by the socialist heritage. This legacy will be described below in the context public enterprises.

4.2 Heritage from the Past – Public versus Private Ownership

The essence of the socialist economy was state property and thus the expansion of private enterprises was bound to be strictly limited. Even so, small-scale private companies were sometimes formally or informally allowed during reform-oriented periods although they were discriminated against by political reasons. Private firms' access to many resources was limited and they were not allowed to compete with state owned enterprises for centrally allocated resources, such as bank credit (Kolodko, 2000).

Still today public enterprises often have advantages over private firms as a general problem in transition economies is weak legal systems and uncertain rule of law. The political hierarchy is often still superior to the legal system, and laws are therefore not equal for everyone. As transition proceeds, however, the rule of law can be expected to increase (Prokopijevic, 2001). Private firms still experience vague property rights, poor business laws and reduced access to markets. All of this creates obstacles, destroys their business opportunities, and generally refrains them from formal financing. Poor laws increase the risks for formal investors and augment firm obscurity, thereby lowering the

willingness of external parties to invest (La Porta and Lopez-de-Silanes, 1998). Only firms favored by the laws and with a relatively stabile environment will prosper. These firms are very likely to be public firms, used to the ways of the unofficial rules and favored since decades (Prokopijevic, 2001).

Almost all SOE's from the command era inherited heavy inefficiency problems due to former state policies. Such problems could be excess workers, large pension plans, or former comparative advantages which have turned into shortcomings in the market system. The latter could simply be the sector in which the firm operates; most communist countries originally chose to invest mainly in the heavy industry in which they had no actual comparative advantage. After the reopening of the countries, or as soon as reforms were allowed, these sectors proved highly overvalued (see Hedlund, 1996 or Lin et al., 1996 for more elaborated discussions). In fact the value of some products were so low that the "value added" was negative; the value of the raw material was larger before treatment (Wessel, 1992). Consequently, these inherited problems affect the performance and profitability of SOE's still today but also places them in a very favorable position when bargaining for compensation with the government. The soft budget constraints of SOE's are thus likely to be particularly severe in transition economies (Kornai et al., 2003; Lin and Tan, 1999), even in those that have come far in the transition process, and they may even persist after privatization of the SOE's (Maskin and Xu, 2001).

During the command era, monetary incentives, such as bonuses, were scarcely used for workers and management in SOE's. Good performance could be rewarded by promotions but was usually acknowledged by honorings and medals (Hedlund, 1996). Hence the principal agent-problem was severe and there were basically no incentives for others than very devoted party members to work hard. The problem was particularly severe in firm management as managers neither had the incentives to cooperate with other firms, nor to produce usable goods but rather minimized the work needed, producing giant nails and unmovable beds to fulfill the plan goals measured by weight (Hedlund, 1996).

When the system changed and privatization begun, the importance of private property laws was not altogether clear in all countries. In Hungary, for example, managers in supposedly private firms were not allowed to treat their profit or income according to their own judgment but state restrictions were present (Wessel, 1992). As a result, owners still lacked the incentives to take responsibility for less preferred decisions, instead they continued to play the role of advocates for the workers, accepting all demands without making sure that the company had the necessary funds (Wessel, 1992; Hedlund, 1996).

In SOE's, or former SOE's, the old methods of managing have changed but still large inefficiencies are present, especially in the less transformed economies. Therefore the usual compensations to minimize the principal agent-problem can obviously not be taken for granted (Oman et al. 2003; Beck et al., 2006).

This section has briefly described the background and the present situation of public firms to reach the clear conclusion that public firms in the average transition economy are highly inefficient. Based on this we will now see how public enterprises still can experience advantages over private enterprises in acquiring formal funds.

4.2.1 Advantages of Public Enterprises

With objective methods of measuring creditworthiness, such as those that the Basel Committee advocates, SOE's in transition economies should not have larger access to finance than private firms, but quite the opposite, as they are clearly inefficient. However, many studies show that the most striking feature is not that state-owned firms are extremely inefficient; as inefficiency to a great length is large also in privatized firms, but that new, private, firms are far more efficient and better performing than old competitors (McMillan and Woodruff, 2002; Hutchinson and Xavier, 2006; OECD, 1996). Nevertheless, state owned enterprises were for a long time favored and had a greater access to formal funds in many transition economies (McMillan and Woodruff, 2002;

Maskin and Xu, 2001) Some main reasons why financial institutions are likely to still lend money to public firms are briefly explained below and can be described as:

- Conservative bureaucrats
- State directed loans
- Official or unofficial discrimination
- Personal Networks

New methods are difficult to put into practice when old, conservative bureaucrats are responsible for implementations, and the priorities of different characteristics in banks risk evaluation might not have changed even though the directives, as well as political and business environments have (Li, 1998). A striking example is how the generally very negative perception of markets and competition persists on the Russian countryside while having changed in the more urban areas (WB, 2002b). The exception from the rule is China, where the government realized this problem and created a pension law that ensured that old Maoist bureaucrats soon disappeared out of the system (Li, 1998).

State directed loans or low-interest credit from publicly owned banks might be issued to save particularly important SOE's or as compensation for inherited problems in current, or former, SOE's. The consequence is that less creditworthy firms sometimes have larger access to credit (Lin and Tan, 1999). In worst case firms continue their business in command economy style, not caring much for profit (Fries and Taci, 2002).

New legislation, though much needed to strengthen the rights of private firms, cannot always be implemented problem free and formal discrimination might long persist as old laws and rules remain. Public firms may experience formal advantages that make it more likely that they use formal finance (Potter, 1999). One example is the listing on the Chinese stock market; although the former listing system, which strongly favored state-associated companies, was abandoned in 2000, companies from the old system who still were waiting to be listed were allowed to keep their place in the line. Five years later these firms, mainly SOE's, still had priority over other enterprises (Pistor and Xu, 2005). As transition proceeds formal discrimination is expected to lessen, while informal

discrimination might persist and favor SOE's (Prokopijevic, 2001). For example, old structures separate public and private firms into different markets with differing business climates. Public firms usually act on markets with less competition which makes them less efficient on the one hand, but also allows them to grow larger (Rosen, 2002).

Personal networks have proved to be of great significance for acquiring formal funds in many transition countries (Lindbeck, 2006; Beck et al., 2002; Zhang and Fung, 2006). In Vietnam, for instance, many creditworthy private firms have difficulty accessing bank credit as to acquire loans a good relationship with the bank is often more important than healthy finances (Ngoc and Nguyen, 2006). Good connections with banks are correlated with increasing size and age of the company and makes SOE's or privatized former SOE's prioritized (Lindbeck, 2006). Also the previous experience of the firm management has been found to affect firms' access to formal capital positively regardless of the performance of the firm (Le et al., 2006). This might to some extent be explained by the longer time a more experienced manager have had to establish networks (Cull and Xu, 2005).

This section has demonstrated how inefficient public firms in transition economies may still be more likely to use formal funding than their poor performance and inefficiency indicates. As the exact degree of transition of the countries is unknown it is not possible to discern how large this effect may be, or in how many countries it is an issue. This implication of public ownership will soon be examined empirically but first the aim of this thesis will be repeated and clarified below.

4.3 Summary Hypotheses

Having thoroughly discussed the subjects of formal external financing, evaluation of creditworthiness, and public ownership in chapter three, and thereafter put them into the context of transition economies in chapter four, our introductory research questions can now be reformulated into concrete hypotheses. These hypotheses will form the base on which we build the following empirical part of the thesis.

We have concluded that the institutions of formal external financing, i.e. banks and stock markets, are highly dependent on reliable regulations and subsequently the transition to market economy has proved to be very difficult in terms of implementing a market-based financial system. Inevitably, one can also see a relative difference in how far individual transition economies have progressed in their reforms. We state that this differing degree of transition is likely to have an impact on firms' usage of formal external capital and form the following hypotheses:

H1: The degree of reforms is positively correlated with the probability that firms use formal external credit to fund new investments.

Also, the differing degrees of reforms are expected to have an impact on how financial institutes evaluate creditworthiness which in turn affects which firm characteristics are correlated with the use of formal finance. As public firms are clearly less creditworthy than private firms, SOE's in top reform countries are expected to have the lowest probability to use formal credit relative private firms in the same group, middle reformers are expected be intermediate, while the impact of public ownership is likely to be relatively lower in laggard countries.

H2: The type of firm ownership – public or private – affects the probability that formal external credit is used. Public firms are less likely to use formal external credit as the degree of reforms increases, ceteris paribus.

5. Empirical Analysis

This section starts by grouping the transition countries by their level of reform. Thereafter the data and the model used to analyze the summary hypotheses from the previous section is presented and followed by empirical testing and presentation of the results.

5.1 Categorization Based on the Progress of Reforms

The grouping of transition economies is classified with the intention to divide the countries into groups depending on their institutional, and market development. The division has been performed on the basis of the EBRD transition indicators[2] for 2005 or 2003 respectively. These evaluate each country's annual progress in transition by indicators in eight categories covering market-oriented reforms and infrastructure. We have chosen only to include the categories measuring market-oriented reforms to determine transition. The categories included are: enterprise reform (small, and large-scale privatization, and enterprise restructuring); price liberalization; trade and foreign exchange system; competition policy; and development of financial institutions (banking reform and interest rate liberalization, securities markets and non-bank financial institutions). The scale stretches from 1 (little or no reform) to 4.3 (standards typical of advanced industrial economies). The indicators measure liberalizations as well as the forming of new institutions, the protection of shareholders rights and the methods used for evaluating the creditworthiness, for the scores of individual countries see appendix 1. In all listed countries except for Uzbekistan the most reformed areas are one of the following; small scale privatization, trade and forex system, or price liberalization. Similarly, in all countries except for Belarus and Poland enterprise restructuring, competition policy, and securities markets and non-bank financial institutions are at least two out of the three least reformed factors. Altogether, Uzbekistan and Belarus are very

[2] For an instructive description of all indicators, see EBRD Methodology.

poorly developed on all points and show the lowest averages out of all countries. Poland is well developed on most points but seem lo lag behind in the large scale privatizations. According to the means of these variables the countries studied can be divided into three groups: top reformers, middle reformers and laggards. Altogether these indicators show that the country division is fairly consistent and would not change dramatically if the indicators would be differently weighted.

The EBRD does unfortunately not rank all transition economies but only the European and Eurasian countries. This means that indexes for China (2003), Vietnam (2005) and Cambodia (2003) are not available from this source. Still, we have been able to rank these countries by using the estimates of the categories from the IMF (2000) "World Economic Outlook, Focus on Transition Economies" where the EBRD indicators from 1999 are presented and extended with complementing information for the added countries. To complement these rather old numbers, a working paper with the same kind of estimates (Spoor, 2004), from 2002 has been used. As the listings are in accordance, the three transition countries are placed in the fitting groups. In this thesis, Cambodia is placed in the middle group while Vietnam and China are regarded as laggards concerning financial and market-oriented reforms.

Generally, competitive democracies made the most progress in implementing market-oriented reforms during the first ten years of transition, concentrated regimes and war-torn countries were intermediate reformers, and one-party states have made the least progress (WB, 2002a). This fits well with Serbia and Montenegro who started making significant progress after the embargos were lifted, but where the formulation of a new government structure and national goals delayed it from catching up with neighboring countries (UN, 2003) and according to the transition indicators for 2003 it remains among the slow reformers.

To the top reformers usually only the new EU-members of 2004 plus Croatia are counted. Depending on where the division is made all new member countries, plus Croatia, can be included (UN 2003, Lavigne 2000). Romania, Bulgaria and Slovenia have the lowest

performance of the countries among the top reformers. Still they are far ahead of the second group. We chose to follow the line of reasoning in the prior discussion about the end of transition, in section 4, and consider the EU membership as a major milestone in transition, especially as all of them scored higher than other countries on the EBRD ranking, see appendix 1 (Koldoko 2000, Lavigne 2000) and add them to the group of top reformers.

Top reformers:
Bulgaria, Croatia, Estonia, Czech Republic, Slovakia, Hungary, Poland, Latvia, Lithuania, Romania, Slovenia
Middle reformers:
Ukraine, Russia, Kirgizstan, Kazakhstan, Georgia, Macedonia, Cambodia
Laggards:
Belarus, Serbia and Montenegro, Tajikistan, Uzbekistan, Vietnam, Moldova, China.

5.2 Data and Summary Statistics

The data set used for this thesis is from the World Bank Enterprise Survey (WBES) and only covers for-profit firms. A strength of the data set is that it reflects the composition of the economies in terms of sectors and the size of firms (WBES Implementation Manual) and can consequently be regarded as a rather realistic picture of the situation in the 25 transition countries studied here. To avoid the informal sector only firms with five or more full-time employees are included in the sample (WBES Implementation Manual).

A potential problem with the data set is that it only represents firms that were willing to participate in the survey. Refusals to participate have been substituted with willing firms and hence the samples may not be entirely random. In total there were 11'505 firms surveyed in these countries, but due to missing observations in the dependent variable the

final sample consists of 7'993 observations, where the group of top reformers consists of 3'242 observations, the middle reformers of 1'984, and the laggards of 2'767 firms.

In Appendix 2 we summarize the number of observations for each country and relevant facts about the countries macro economic situation, more specifically their GDP per capita, GDP growth and level of inflation. This information is collected from the IMF "World Economic Outlooks". Also an index indicating respective countries rule of law is presented. The index originates from Kaufmann et al. (2006), working for the World Bank, as a part of their world governance indicator. It is a normal distributed index ND (0;1) and is regarded as one of the most carefully constructed governance indicators (Arndt and Oman, 2006; in Kaufmann et al., 2007). The data on which the indicator is based on is collected from several different sources and averaged. For a more extensive discussion see the World Bank (2002c).

An inspection of the macroeconomic factors in Appendix 2, shows, as expected, a wide variation among the countries. Inflation ranges between 0.5 % in Macedonia and 21 % in Uzbekistan, though most countries have inflation rates closer to 3.5 %. Uzbekistan is also the country with the lowest rating on the rule of law index while Estonia has the highest, meaning that Estonia is the country where the laws and regulations are the largest most implemented and the fewest exceptions from laws exist. Most of the countries have a negative rating on this normally distributed rule of law-index, indicating that they score below the world average. GDP per capita has a mean value of 4'102 US dollars but varies from 316 US dollars in Cambodia, to 11'929 in Hungary. Unsurprisingly, GDP-growth also varies greatly, from negative growth rate in Kyrgyzstan, -0.6 %, to positive and on average quite large numbers in the remaining countries, the mean is 6.2 %. Latvia stood for the maximum growth, 10.2%, but also China had a growth that reached 10 %.

Returning to the firm-level information, table 5.1 shows the spread of the observations according to levels of country reform and firm characteristics. It also reports the share of firms using formal credit in each group.

Table 5.1 The use of formal external financing in different groups of firms. For details of sources see appendix 3.

Factors	Number of Observations	Share of Firms in Sample	Share of Firms with Formal External Finance
Total	7993	100%	23.7%
Top Reformers	3242	40.6%	26.7%
Middle Reformers	1984	24.8%	16.7%
Laggards	2767	34.6%	25.3%
Private Ownership	7122	89.2%	23.5%
Public Ownership	862	10.8%	25.4%
Exporter	1443	18.1%	31.7%
Non Exporter	6550	81.9%	21.8%
Small Firm	3360	42.0%	14.6%
Medium Sized Firm	2514	31.5%	26.9%
Large Firm	2110	26.5%	34.4%
Service	3653	45.7%	19.3%
Manufacturing	3501	43.8%	29.1%
Other	839	10.5%	11.5%
Foreign Owned	1020	12.8%	24.3%
Domestic Owned	6973	87.2%	23.6%
Big City or Capital	3432	42.9%	20.5%
Other Location	4561	57.1%	26.1%

There is an interesting difference in the share of firms that use formal external finance across the reform groups. There is no difference between top or laggard, but a considerably lesser share of the firms in the middle group use formal finance.

From the information in table 5.1 it can be derived that the total sample consists to 42.0 % of small enterprises; 31.5 % of medium sized firms and 26.4 % of large firms. The definition of firm size used here follows the WBES: small firms: 5-20 employees; medium sized firms: 20-99 employees, and large firms 100 or more employees. Firms

with less than 5 employees are not included in the data set (WBES, Data Details). Further, around 11 % of the firms in the survey are government owed while 12.8 % are foreign owned. 46 % of the firms act in the service sector while 44 % are in the manufacturing. The firms are quite evenly divided between locations in large cities and elsewhere.

The size of a firm has a great connection to the use of formal capital; a lesser share of firms have formal financing the smaller they are. Among public and private ownership there is hardly any difference between the shares of firms with formal external credit, as is the case also for foreign and domestic owned enterprises. However, whether the firm is exporting or not makes a great difference to the use of external financing as does sector it belongs to; the share of firms with formal financing is much larger in the manufacturing sector than in services and other sectors.

Table 5.2 Age. For details of source see appendix 3.

	Firm Age
Min	1
Max	261
Mean	15
Median	10
S. D.	17

Firm age, the only continuous firm specific variable is presented in table 5.2. It ranges between brand new firms and very old, though the very old firms are fewer. Most firms in the data set are between one and about 30 years old.

Having presented the overall spread of the data set, a more thorough examination of the two factors of specific interest, type of ownership and degree of reform, will be undertaken. In table 5.3, below, the ownership forms are divided on the reform groups to see whether any patterns are yet to be recognized. The group of laggards has a significantly larger share of public firms than do the others, 17 % versus around 7.5 %. The share of public firms in the middle, and the top reformers are nearly the same. When the share of firms with formal finance is split between private and public ownership we can see that the share of firms with formal financing is larger for private than public enterprises in the two more reformed groups, while the relation is the opposite in the least reformed group.

Table 5.3 The use of formal external financing in public and private firms.

Factors	Number of Firms				Share of Firms with Formal External Finance	
	Number of Public Firms	Share of Public Firms	Number of Private Firms	Share of Private Firms	Public Firms	Private firms
Top Reformers	246	7.6%	2996	92.4%	21.1%	27.1%
Middle Reformers	146	7.4%	1838	92.6%	8.9%	17.3%
Laggards	470	17%	2288	83%	32.8%	23.7%

5.3 The Empirical Model

For the empirical analysis we use a probit model. Probit is a binary choice model which is explained closer in appendix 3.

Our model can be expressed mathematically as:

D *Formal Credit* = β_0 + β_1 D *Reform Top* + β_3 D *Reform Laggard* + β_4 D *Public* + β_5 D *Small* + β_6 D *Large* + β_7 *Age* + β_8 D *Manufacturing* + β_9 D *Services* + β_{10} D *Foreign* + β_{11} D *Export* + β_{12} D *Big City* + β_{13} D *GDP Growth* + β_{14} D *GDP per Capita* + β_{15} D *Law* + β_{16} D *Inflation*

D indicates that the variable is a dummy variable. A full list of explaining all variables, how they are calculated, and their sources is available in appendix 4.

The dependent variable, *D Formal Credit*, is a binary variable which measures the usage of formal external credit to fund new investments: loans from domestic and foreign banks and publicly listed enterprises' sale of stock.

The independent variables which will be used for testing of *H1* and *H2* are *D Reform Top*, *D Reform Laggard* and *D Public*. *D Public* is a dummy variable which controls for public ownership. The other two were derived from section 5.1 above.

The remaining variables are control variables which have proven to be significantly correlated with the use of formal finance in various previous studies (see for instance Beck, et al., 2002; Hyytinen and Pajarinen, 2007; de Haas and Peters, 2006).

Below, a presentation of the control variables expected impact on the dependent variable will follow and thereafter potential sources of error concerning the variables will be discussed.

5.3.1 Expectations

A discussion of the expectations on all variables and their expected signs will now follow, and is summarized in table 5.4.

Starting with the variables which are expected to generate positive coefficients; we include *D Large, Age, D Exporter*, and *D Big City*. The reasons for the positive correlation between firm age, size, and whether it is an exporter, are apparent and have been discussed earlier in the text. *D Small* is expected to show a negative sign, which also is straight-forward. The reason that firms in big cities are expected to have a higher probability to use formal credit is the greater access of financial intermediaries. (Beck, et al., 2002; Beck et al., 2006; Hyytinen and Pajarinen, 2007; de Haas and Peters, 2006; Ngoc et al., 2006).

Further, foreign-ownership is controlled for, but its expected impact is not totally unambiguous. Foreign firms are expected to be less opaque, and for this reason they have

been found to have greater *access* to formal capital, but at the same time it has been documented that they actually use less formal capital as they often receive funds from the mother company. The latter effect is expected to dominate and hence *D Foreign* is likely to have a negative coefficient (Meino, 2005; Filatotchev et al., 2007).

For the control variables concerning the sector belonging of the firm; *D Services* and *D Manufacturing*, the direction of the influence cannot be predicted as it depends on the specific industries in the sectors of each country. For instance, a firm in the manufacturing sector could be either highly efficient, for example because of a computerized production scheme, or extremely inefficient due to old machinery and waste of resources. Nevertheless, sector belonging has been shown to have an impact on the use of formal financing and is thus controlled for in this study (Ngoc et al., 2006; Beck, et al., 2002; 2006).

Table 5.4 Expectations on the variables.

Variable	Expected signs
D Small	-
D Large	+
Age	+
D Manufacturing	+/-
D Services	+/-
D Foreign	-
D Export	-
D Big City	+
GDP Growth	+
GDP per Capita	+
Rule of Law	+
Inflation	+/-

In addition to the firm specific variables, a number of macroeconomic indicators are controlled for to capture some major economic differences between the countries. These variables are: *Inflation, GDP per Capita,* and *GDP Growth*. The negative effect of the former is unambiguous in previous studies, while the two latter are expected to be positively correlated with formal financing (Beck et al., 2002; Beck et al., 2006; de Haas and Peters, 2006; Scholtens, 2002)

Finally, an index for the rule of law is included to capture the impact of the countries' differing legal development and level of legal efficiency. Several scholars have found a positive connection between legal development and capital markets (see Prokopijevic, 2001; La Porta and Lopez-de-Silanes, 1998; Beck et al., 2002).

As the expectations on all variables are now clear, the variables themselves; their qualities and potential problems are now to be discussed below.

5.3.2 Discussion of the Variables

The dependent variable measures the use of formal external credit and therefore all firms that use more than 0 % are regarded as using the source even though the proportion of formal credit they use may be small. The reason behind this choice is that this thesis examines the difference in the usage of formal credit, i.e. which firms use this type of capital, not how much they use. A potential source of error in this variable is that there are also a large number of missing observations, the total data set contains 11'504 and whose exclusion may cause the sample to be not entirely random.

Also, it is important to note that the dependent variable measures whether formal financing was used to fund new investments the year before the survey was conducted, while the independent variables in the model regard the firm the same year as the survey was conducted. Thereby the causality of the variables must be kept in mind, although most of the independent variables are not expected to change in one year's time. Even the most changeable, size and whether the firm is an exporter, can in large be expected to be the same. However, the variables that control for country- specific differences: *Inflation, GDP Growth, GDP per Capita, Rule of Law* and the reform groups, are in general more changeable, especially *Inflation* can change quickly which is a potential source of error in the empirical analysis. Furthermore, the macro-economic variables are globally interlinked and therefore another potential problem could be that the survey was conducted 2005 for most countries, but 2003 for a few. As the difference in time is relatively small however we do not regard this as a major source of error.

The dummy groups for degree of reform are measured through a selection of the EBRD transition indicators. We have chosen to only include market-oriented reforms, hence excluding reforms in the infrastructure, which makes the variable a measure of liberalizations, privatizations, and reforms in the financial markets. This has previously been discussed in section 5.1. We use the index to divide the countries into three groups: *D Reform Top, D Reform Middle,* and *D Reform Laggard*, and only include the top and the laggard group in the regression as dummy variables. The categorization is necessary to conduct the sub sample regressions, but in the total regression the index itself would have been a sharper instrument to measure transition, as the categorization might include other factors that are common for the group. For example, almost all countries categorized as top reformers are neighbors, traditionally included in the sphere of interest for Western Europe and have had stable and highly developed trading partners. However, as discussed in section 5.1 indexes are not available for all countries in this study and hence we have to make do with the dummy reform groups from the categorization.

Turning to one of the variables used for testing the hypotheses, *D Public,* a note should be made on how it is measured. As the focus lies on whether public ownership has any impact on the usage of formal finance the variable is treated as a binary variable; either a firm is considered completely public or private. A firm is treated as public if more than 50 % of the firm is owned by the government, or if the government is the firm's largest shareholder. The ownership variable does not cover cases where several smaller minority owners are closely linked and assert an influence on the company, stronger than the power of the largest owner.

The dummy variables controlling for size, *D Small,* and *D Large* are measured in the total number of permanent workers and temporary workers adjusted for average employment time. The size of a firm can be measured in many ways but often a combined measurement of employment, assets and turnover (for an extensive discussion of these definitions in transition economies, see UN, 2003). In the data material used in this study however, no other factors but employment were available.

Also the variable *D Big City* may include measurement errors. The variable consists of the capital cities as well as cities with a population over one million and may hence exclude cities regarded as large in countries with smaller total populations, and include smaller cities in highly populated countries, i.e. China.

The variable *Age* varies greatly, but we have chosen not to exclude outliers to avoid loosing observations and as we expect little difference in a very old firm's use of credit and an extremely old firm's use of credit. Whether a firm is 100 years old or 270 years old is not likely to be of significant importance.

Lastly, a significant source of error may be the lack of performance measures in the model. This lack stems from the scarcity of such measures in the data sets of the countries in this study. Conventional performance measures such as firm growth, total assets, and total liabilities are often completely unavailable, particularly in countries of less institutional development, such as transition countries. Furthermore, if they are available in the data set, there is often a large number of missing observations or they contain a high number of extreme outliers.

5.4 Testing and Results

The empirical testing was performed in a two-step process, where the probit model first was regressed on the total dataset and thereafter on each reform group. Before initiating the inference, a few tests concerning the suitability of the model for the whole sample will be presented. Thereafter the same procedure will follow for the sub groups and lastly the results will be discussed more thoroughly.

First, the correlations of the variables were studied to see if multi-collinearity was present between any of the independent variables. The correlation matrix in appendix 5 shows that no disturbingly high correlations were detected. Next, all variables that were not significant in themselves were tested for joint significance by the use of a Wald-test. The null hypotheses of no joint significance was rejected, and hence the variables were not excluded from the model (for test statistic and p-value see appendix 5).

A specification test was performed to try for omitted relevant variables and incorrect functional form. It was performed by carrying out an LM-test (see Verbeek, 2004) using Davidsson and McKinnons artificial regression method (for a description of hypotheses testing using this method see E-views 5 User's Guide, 2004; Kennedy, 2003). The null hypotheses of correct specification could not be rejected and hence the model was assumed to be correct specified (for test statistic and p-value see appendix 5).

The model was then tested for heteroskedasticity, by performing an LM-test using the same artificial regression method. The null hypotheses of homoskedasticity could not be rejected (for LM-statistic and p-value see appendix 5).

Lastly Effron's R^2 (for exact formula see Long, 1997) was calculated to provide a measure of how well the model fits the data. Effron's R^2 is presented below in table 5.5 together with the estimation output. As explained in Appendix 3 the estimated coefficients cannot be interpreted directly, but the signs are nevertheless equal to the signs of the independent variables' marginal effects (Verbeek, 2006).

Table 5.5 Estimation output, total sample.

Variable	Coefficient		S.E.
D Reform Top	0.049		(0.076)
D Reform Laggard	-0.052		(0.055)
D Public	-0.132	*	(0.057)
D Small	-0.480	***	(0.041)
D Large	0.259	***	(0.043)
Age	-0.001		(0.001)
D Manufacturing	0.159	**	(0.058)
D Services	0.030		(0.058)
D Foreign	-0.193	***	(0.052)
D Export	0.110	**	(0.044)
D Big City	-0.262	***	(0.036)
GDP Growth	1.440		(0.776)
GDP per Capita	0.000	***	(0.000)
Rule of Law	0.481	***	(0.078)
Inflation	0.800		(0.435)
Effron's R^2	0.067		

*: p<0.05; **: p<0.01; ***: p<0.001

All the control variables, apart from *Age, D Services, GDP Growth* and *Inflation* were significant. The signs of the significant variables confirmed the expectations, with a few exceptions: The coefficient of *D Manufacturing* proved to be positive and *D Big City* surprisingly showed a negative coefficient. As explained in appendix 3, the sizes of the coefficients have no straightforward meaning. The interpretation of a coefficient, say *D Foreign*, is that foreign firms have a lesser probability of using formal external credit, ceteris paribus.

Turning to our variables of interest: *D Reform Top*, *D Reform Laggard,* and *D Public*, only *D Public* proved to be significant, on the 5 % probability level. As the reform groups are not significant, *H1*: that firms have a higher probability to use formal external credit in more reformed countries, can not be supported.

To be able to interpret the size of the coefficient of *D Public*, the technique described in Appendix 3 was used to calculate the marginal effects. The marginal effect of *D Public* is -0.082, which means that if an enterprise is state-owned, the probability that it has funded new investments by using formal external credit is 8.2 % less than for a private firm,

ceteris paribus. This supports the first part of *H2*: that public ownership is significantly correlated to the usage of formal external credit. Now we will proceed to see if the impact of this variable differs in the individual reform groups, in the next step of the empirical analysis.

5.4.1 Results for the Individual Reform Groups

To see whether the relationship between public ownership and the usage of formal external financing to fund new investments changes depending on the degree of reforms, the model was regressed on each of the three sub groups. Tests for incorrect specification and heteroskedasticity were performed and Effron's R^2 was calculated along with the marginal effects of *D Public* on each sub sample. Before presenting the estimation output, the tests will be discussed further (for all test statistics and p-values see appendix 5).

The specification tests showed that the top and laggard groups are correctly specified, whereas the middle is not. This problem also showed in the test for heteroskedasticity, the model almost certainly has heteroskedastic disturbances when regressed on the middle group. The null hypotheses of homoskedastic residuals was not rejected for the top reformers, and rejected on the 5 % probability level, but not on the 1 % level for the laggard countries.

Unfortunately probit models are very sensitive to heteroskedasticity and it can cause the estimators to be inconsistent (Kennedy, 2003). Heteroskedasticity in the error term is however very common, particularly in large cross-section regressions and despite the severity of this problem, there is no straightforward way to correct for it in binary-choice models. We follow the recommendation of Verbeek (2006) who suggests a simple relaxation of the assumption about uniform variance in the error term.

Now we will turn to the estimation output for each reform group, the signs and significance levels are presented in table 5.6 below (for total estimation output, see appendix 5).

Table 5.6 Estimation output for reform groups.

	Top Reformers		Middle Reformers		Laggards	
Variable	**Sign**	**Sig. level**	**Sign**	**Sig. level**	**Sign**	**Sig. level**
D Public	-	***	-	***	+	
D Small	-	***	-	***	-	***
D Large	+		+	**	+	***
Age	+		-		-	
D Manufacturing	+		+	**	-	
D Services	-		+		-	
D Foreign	-		-		-	**
D Export	+		+		+	
D Big City	-	**	-	***	-	***
GDP Growth	-		+	***	+	*
GDP per Capita	-		-	*	+	***
Rule of Law	+		+	***	+	***
Inflation	-		+	**	+	***
Effron's R^2	0.054		0.084		0.099	

*: $p<0.05$; **: $p<0.01$; ***: $p<0.001$

The table shows that interesting differences occur when the model is regressed on the sub groups. First, Effron's R^2 deserves to be noted. The goodness-of fit of the model proved to decrease as the degree of reforms increased. This can be explained by the lesser significance of the control variables for macro economic situation and rule of law. In the group of top reformers no country specific variables are significant; for the group of laggards, however, all country specific variables explained variation in the use of formal capital. This important difference is likely to be the cause of the diminishing values of Effron's R^2.

The groups will now be presented one by one, starting with the top reformers: Compared both to the total regression and to the other sub-groups, the top group has much fewer significant variables. The relation between size and use of formal capital is weaker than in the other groups: small firms still have a lesser probability of using formal capital, but there is no connection between large firms and formal credit. Besides *D Small* the only

significant firm specific variables are *D Public* and *D Big City,* all three show the same signs as in the total sample. Our variable of specific interest, *D Public,* proved to be significant on the 0.1 % level. The marginal effect is calculated by the same means as above to -0.112: a public firm has 11.2 % lesser probability to be using formal capital than a private, ceteris paribus.

In the middle group more variables are significant, all of those that control for country specific differences are significant. Surprisingly, the coefficient of *GDP per capita* shows a negative sign, and inflation shows a positive sign, the two remaining country-specific variables shows expected signs. As for the firm-specific variables, *D Public*, *D Big City,* the two size variables, and *D Manufacturing* are significant for the probability of firms' use of formal credit and all show the same signs as in the total sample. *D Manufacturing*, shows a positive coefficient, in line with the results in the total model. It is also worth noting that this variable only proves to be significant in the middle group. *D Public* is highly significant, on the 0.1 % level, and has a marginal effect of -0.108: the probability that public firms use formal external credit is thus 10.8 % less than for private firms, ceteris paribus.

Lastly, we will take a closer look at the group of laggard countries. In this sub-group all the macro variables prove important to explain the differences in firms' use of formal credit, they are all significant, and positive. The size variables and *D Big City* are significant, as well as *D Foreign* which is insignificant in the two other sub-samples. All these variables have signs in line with the total sample. *D Public* proved to be insignificant in this regression, meaning that in laggard countries no differences between public and private firms' probability of using formal capital can be determined, ceteris paribus.

For a better understanding of the impact of *D Public* one may look at the difference of the marginal effects in the top and middle group. In the top group, *D Public* had a marginal effect of -0.112, and in the middle group a slightly less negative effect of -0.108; the difference is 0.4 percentage points. Thus, state owned enterprises in the top group have a

lesser probability of using formal credit relative private firms in the same group, than do public firms in the middle group. This may also be compared to the marginal effect of *D Public* in the total regression: -8.2 %. In the laggard group no significant difference could be discerned between public and private firms usage of formal capital. In other words, there seems to be a negative relationship between SOE's usage of formal credit relative private firms, and the level of reforms. This supports the second part of *H2*: public firms' use relatively less formal external credit in transition economies as the degree of reforms increases.

Before continuing to the conclusions, a few of the regression results will be discussed further.

5.4.2 Discussion of the Results

Effron's R^2 shows that the model has a relatively low goodness-of-fit, both in the total group and in the sub-samples, which implies that other variables, not included in the regression, are also important when explaining the variation in the samples. This is the case particularly in the top group, where the goodness-of-fit of the model is significantly less relative the other sub-groups. The firm specific variables do not explain a great deal of the variation but the main difference lies in the lesser importance of the country-specific variables; in the group of top reformers neither rule of law nor any of the macro-economic variables were significant whereas all were significant in the two other groups. A reason for this can be that the countries in the top group are less diverse in their overall legal and economic situation, and therefore these variables do not explain any of the variance in firms' usage of formal external credit.

The model did not pass the specification or heteroskedasticity tests when regressed on the middle group. One reason for this may be that the group compromises both countries only

slightly better than the laggards as well as countries only a hairsbreadth away from belonging to the top group. The range is thus very large and heteroskedastic residuals are not an unlikely consequence.

Turning to specific firm variables we can conclude that *Age s*urprisingly was not significant in any of the regressions, despite many scholars having found it to be a very robust predictor of usage of formal credit. The reason may be that the importance of this variable in transition economies is less due to their background, and that the variable public instead plays a similar role. However, it is important to stress that the correlation between the two is not disturbingly large, as shown in appendix 5.

D Big City unexpectedly showed negative coefficients for all groups. There are no apparent reasons for this result, but it is likely to stem from an underlying variable. One hypothesis could be that networking is important and that firm managers in very large cities have fewer opportunities to establish reliable networks relatively managers in less populated locations.

Also, a surprising result regarding the macroeconomic variables was found: In the middle group the coefficient of *GDP per Capita* was negative. The cause of this is unknown.

Summing up, H1, that the degree of reforms is positively correlated with the probability that firms use formal external credit to fund new investments, could not be confirmed. There is no evidence that the usage of formal credit differs between the reform groups, with more firms in the top group using formal external financing, an intermediate number of firms in the middle, and fewer firms in the laggard countries. *H2,* that type of firm ownership – public or private – affects the probability that formal external credit is used and that public firms are less likely to use formal external credit as the degree of reforms increases could, however, be supported. Public ownership has a negative impact on the usage of formal credit in the total group. When the total group is divided, the regressions on the sub samples show that public firms in the top group use formal credit more seldom than private firms. Firms in the middle group use slightly more, but in the laggard group

no difference is present between public and private firms' usage. Lastly, the regressions on the subgroups yielded yet one more interesting result; the composition of the significant variables proved to be relatively similar for the laggards and the middle reformers, but not for the top reformers.

6. Conclusions

In this section our empirical findings are discussed in context of the theoretical framework. Thereafter a few topics for further research are suggested.

The purpose of this thesis was to discern if differences in the degree of reforms affect firms' usage of formal external credit in transition economies. The focus on public firms was chosen as they, due to their special status during command economy, are expected to play a particularly interesting role in transition economies.

The literature has shown that the financial sector has been among the most difficult areas to reform in transition economies, as regulations have been hard to implement, and financial institutions slow to develop. These findings can be summed up by the polish economist Hanna Gronkiewicz-Waltz's (2006) words: "Notwithstanding the significant progress made in banking sector development in transition countries in the past 15 years, the financial sector still lacks the depth and breadth of that of the Euro zone. No country's system has yet progressed to the point that it can be described as possessing a mature, fully functioning, market-oriented and efficient banking sector."

Turning to the empirical results of this study, the hypothesis that firms' usage of formal funds is positively correlated with the degree of transition, could not be supported. This result was rather surprising as it implies that the likelihood that firms use formal credit to fund new investments in one of the most reformed countries, say the Czech Republic, is almost the same as in Uzbekistan, one of the laggards, ceteris paribus. The conclusion of these findings is that the differing amount of financial- and market-oriented reforms undertaken between the groups have yet not had a very large impact on this aspect.

Unfortunately, we cannot see our results in relation to other types of economies, but examining them in the context of the theoretical findings this is nevertheless interesting.

The joint conclusion of the empirical and theoretical findings is that regardless of the degree of reforms and how far transition has reached in other aspects, when it comes to the financial sector, transition countries can indeed be treated as one common group, in which all members have relatively underdeveloped financial institutions.

We now turn to take a look at the impact of public ownership and the results of our sub-samples. Examining public ownership is very enlightening as state owned enterprises in the past always were formally favored in these countries. In developed market-economies however, the evidence presented in the theoretical framework prove that, due to their relatively lesser productivity and efficiency, public firms' use of formal capital should be lesser or at least the same as private firms. In transition economies public firms are even highly inefficient and due to frequent failed loans they are significantly less creditworthy than private firms. Subsequently, as the reforms concerning the measurement of creditworthiness reaches a higher level, financial institutes are expected to allocate relatively less credit to public firms. With this line of reasoning in mind, we conclude that top and middle reformers have reached a degree of reform where relatively market-oriented systems of measuring creditworthiness are used. As for the laggard group, it seems as though the road towards market-oriented ways of measuring creditworthiness has been entered as public firms at least do not have a higher probability of using formal credit than private. Nevertheless, since there are no significant differences between private and public firms' usage of formal credit, the laggard countries still have a long way to go to reach efficient financial institutions.

To sum up the conclusions: despite a differing degree of financial- and market-oriented reforms, no differences in firms' probability of using formal credit were present, ceteris paribus. This could cause one to believe that there are no internal differences within the group when it comes to the development of the financial sector. However, a more careful analysis of the sub-groups proves that such a belief would have been too readily embraced. Great differences can be found when looking at *which* firms use formal finance. The financial sector development differs significantly between the sub-samples;

more specifically the impact of public ownership on the usage of formal credit differs greatly depending on the degree of financial- and market-oriented reforms.

6.1 Further Research

As stressed in the beginning, this thesis leaves many interesting questions of the relation between public ownership of firms and formal financing in transition economies unanswered. Some of these issues will be presented below as they provide perfect ground for further research.

First and foremost, a different and more accurate data set would significantly broaden the scope of possibilities, performance variables could be included as well as other variables suspected to have impact on firms' use of formal finance in developing and transition economies, such as personal networks or transparency. More suitable data would also make it possible to replace the reform dummies by a continuous variable, which in capacity of being a sharper instrument may lead to different conclusions.

A major delimitation made in this thesis was to study the *use* of formal capital. Therefore it would naturally be interesting to investigate public firms' *access* to formal financing in transition economies. It is probable that such an analysis would present results similar to this study, but as it would account for firms' that do not seek access to formal funds, it would nevertheless add interesting information.

Lastly, a relevant complement to this study would be to examine the proportion of investments funded through formal external sources in the reform groups, using a linear model. Together with our binary model which analysis the use of formal financing it would present a more complete picture of the subject.

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Appendix 1

Tabell A1.1 Transition indicators for all available countries.

	Year	Large scale privatization	Small scale privatization	Enterprise restructuring	Trade & Forex system	Price liberalization	Competition Policy	Banking reform & interest rate liberalization	Securities markets & non-bank financial institutions	Average	Reform group
Belarus	**2005**	1.00	2.33	1.00	2.33	2.67	2.00	1.67	2.00	1.88	**Laggard**
Bulgaria	**2005**	4.00	3.67	2.67	4.33	4.33	2.67	3.67	2.33	3.33	**Top**
Cambodia	**2003**	NA	NA	NA	NA	NA	NA	NA	NA	NA	**Middle**
China	**2003**	NA	NA	NA	NA	NA	NA	NA	NA	NA	**Laggard**
Croatia	**2005**	3.33	4.33	3.00	4.33	4.00	2.33	4.00	2.67	3.50	**Top**
Czech R.	**2005**	4.00	4.33	3.33	4.33	4.33	3.00	4.00	3.67	3.87	**Top**
Estonia	**2005**	4.00	4.33	3.67	4.33	4.33	3.33	4.00	3.33	3.92	**Top**
Macedonia	**2005**	3.33	4.00	2.33	4.33	4.33	2.00	2.67	2.00	3.12	**Middle**
Georgia	**2005**	3.67	4.00	2.33	4.33	4.33	2.00	2.67	1.67	3.13	**Middle**
Hungary	**2005**	4.00	4.33	3.67	4.33	4.33	3.33	4.00	4.00	4.00	**Top**
Kazakhstan	**2005**	3.00	4.00	2.00	3.67	4.00	2.00	3.00	2.33	3.00	**Middle**
Kyrgyz	**2005**	3.67	4.00	2.00	4.33	4.33	2.00	2.33	2.00	3.08	**Middle**
Latvia	**2005**	3.67	4.33	3.00	4.33	4.33	3.00	3.67	3.00	3.67	**Top**
Lithuania	**2005**	4.00	4.33	3.00	4.33	4.33	3.33	3.67	3.00	3.75	**Top**
Moldova	**2005**	3.00	3.67	2.00	4.33	4.00	2.00	2.67	2.00	2.96	**Laggard**
Poland	**2005**	3.33	4.33	3.67	4.33	4.33	3.00	3.67	3.67	3.79	**Top**
Romania	**2005**	3.67	3.67	2.33	4.33	4.33	2.33	3.00	2.00	3.21	**Top**
Russia	**2005**	3.00	4.00	2.33	3.33	4.00	2.33	2.33	2.67	3.00	**Middle**
Serbia	**2003**	2.33	3.00	2.00	3.00	4.00	1.00	2.33	2.00	2.46	**Laggard**
Slovakia	**2005**	4.00	4.33	3.67	4.33	4.33	3.33	3.67	2.67	3.79	**Top**
Slovenia	**2005**	3.00	4.33	3.00	4.33	4.00	2.67	3.33	2.67	3.42	**Top**
Tajikistan	**2005**	2.33	4.00	1.67	3.33	3.67	1.67	2.00	1.00	2.46	**Laggard**
Ukraine	**2005**	3.00	4.00	2.00	3.67	4.00	2.33	2.67	2.33	3.00	**Middle**
Uzbekistan	**2005**	2.67	3.00	1.67	2.00	2.67	1.67	1.67	2.00	2.17	**Laggard**
Vietnam	**2005**	NA	NA	NA	NA	NA	NA	NA	NA	NA	**Laggard**

Appendix 2

Table A2.1 Macroeconomic variables.

	Year of Survey	Number of observations	Inflation	Growth in real GDP	GDP/Capita	Rule of Law
Belarus	2005	211	10.3	9.2	2775.242	-1.04
Bulgaria	2005	232	5.0	5.5	2422.994	-0.19
Cambodia	2003	487	1.2	7.1	316.21	-1.05
China	2003	1342	1.2	10.0	1097.501	-0.41
Croatia	2005	284	3.3	4.1	8416.288	0.0
Czech Republic	2005	160	1.8	6.0	11929.408	0.7
Estonia	2005	160	4.1	9.8	9423.774	0.82
FYR Macedonia	2005	115	0.5	3.8	2380.355	-0.38
Georgia	2005	73	8.3	7.7	999.966	-0.82
Hungary	2005	470	3.5	4.1	11058.523	0.7
Kazakhstan	2005	308	7.6	9.4	3592.339	-0.79
Kyrgyz Republic	2005	139	4.3	-0.6	455.544	-1.07
Latvia	2005	123	6.7	10.2	6793.337	0.43
Lithuania	2005	174	2.6	7.3	7268.064	0.46
Moldova	2005	239	11.9	7.0	828.254	-0.59
Poland	2005	810	2.1	3.2	7486.811	0.32
Romania	2005	507	9.0	4.1	3602.677	-0.29
Russia	2005	431	12.6	6.4	5458.76	-0.84
Serbia and Montenegro	2003	262	11.3	2.4	2484.137	-0.97
Slovak Republic	2005	157	2.8	6.0	8549.373	0.41
Slovenia	2005	156	2.5	3.9	8549.373	0.79
Tajikistan	2005	102	7.1	6.7	368.572	-0.99
Ukraine	2005	431	13.5	2.6	1739.35	-0.60
Uzbekistan	2005	114	21.0	7.0	419.263	-1.31
Vietnam	2005	497	8.0	7.5	567.537	-0.45
Minimum			0.5	-0,6	316.210	-1.31
Maximum			21.0	10.2	11929.41	0.82
Mean			5.8	6.2	4102.634	-0.23
Median			3.5	6.4	2484.137	-0.41

Appendix 3

Binary choice models such as the probit are based on the maximum likelihood estimation method. The maximum likelihood technique provides estimates of the parameters that give the highest probability of obtaining the observed outcome, given a known or assumed distribution. These estimators are favorable as they, under the right conditions are consistent, asymptotically efficient, and asymptotically normally distributed (Kennedy 2003, Verbeek, 2004).

In the probit model the maximum likelihood estimators are based on a standard normal distribution and a binary dependent variable with two possible outcomes: 0 or 1 (Kennedy 2003, Verbeek, 2004).

One specific characteristic of binary choice models is that their non-linearity brings about the result that the estimated coefficients cannot be interpreted directly. To be able to interpret the size of the coefficients, the exact marginal effects are calculated by computing the predicted probabilities of the model outcome both with and without each variable. The averaged difference between the two outcomes is the marginal effect of the variable. One can also interpret the signs of the coefficients directly, as they always are the same as the signs of the independent variables' marginal effects (Verbeek, 2006).

Appendix 4

D Formal Credit	Dummy variable: 1 if more than zero percent of the firm's new investments last year are funded by foreign or domestic bank loans, or sale of stock in the case of publicly listed firms, otherwise 0. Obtained from the WBES, variables: c227b2, c227c2, c227h2, and c2021.
D Reform Top	Dummy variable: 1 if country's transition indicator exceeds 3,2. otherwise 0. Transition indicator obtained from EBRD, complemented with information from Spoor (2004).
D Reform Laggard	Dummy variable: 1 if country's transition indicator is below or equals 3.0, otherwise 0. Transition indicator obtained from EBRD, complemented with information from Spoor (2004).
D Public	Dummy variable: 1 if more than 50 % of the firm is owned by the government or if the government is the firm's largest shareholder, otherwise 0. Obtained from the WBES, variables; c205b9 and c203c.
D Small	Dummy variable: 1 if the firm has less than 20 employees, otherwise 0. Definition and variable obtained from the WBES, variable; size new=1
D Large	Dummy variable: 1 if the firm has more than 100 employees, otherwise 0. Definition and variable obtained from the WBES, variable; size new=3
Age	Continuous variable, years since firm began operations in the surveyed transition country. Obtained from the WBES, variable; c201
D Manufacturing	Dummy variable: 1 if the firm belongs to the manufacturing sector, otherwise 0.Obtained from the WBES, variable; sector= 1.
D Services	Dummy variable: 1 if the firm belongs to the service sector, otherwise 0.Obtained from the WBES, variable; sector= 2.

D Foreign	Dummy variable: 1 if 10 % or more of the firm is foreign owned, otherwise 0. Definition and variable obtained from the WBES, variable; foreign.
D Exporter	Dummy variable: 1 if the firm is an exporter, otherwise 0. Obtained from the WBES, variable; exporter.
D Big City	Dummy variable: 1 if firm is located in the capital city of the country or in another city with a population with over 1 million population, otherwise 0. Obtained from the WBES, variable; c2071 where Capital city=1; Other city over =2 .
GDP Growth	Continuous variable, growth in real GDP: Real GDP annual percent change. Obtained from IMF "World Economic Outlook - Globalization and Inflation", (April 2006) Tables 5 and 6.
GDP Cap	Continuous variable, GDP per capita in US dollars. Obtained from IMF "World Economic Outlook - Database" (April 2005).
Rule of Law	Continuous index variable: ND(0;1). Obtained from Kaufman et al (2006) Table C5: Rule of Law.
Inflation	Continuous variable, KPI annual percentage change The data are averages for the year, not end-of-period data. Obtained from IMF "World Economic Outlook - Globalization and Inflation", (April 2006) Tables 10 and 11.

Appendix 5

Table A5.1 Correlation matrix

	Inflation	Law	GDP/ Capita	GDP Grow.th	Big City	Export	Foreign	Service	Manuf.	Age	Large	Small	Public	Lag-gard
Top	-0.252	0.844	0.804	-0.398	-0.290	0.107	-0.024	0.012	-0.004	0.085	-0.128	0.172	-0.090	-0.596
Lag-gard	0.046	-0.388	-0.582	0.529	0.202	-0.053	-0.001	-0.095	0.151	-0.010	0.178	-0.249	0.152	
Public	-0.014	-0.042	-0.078	0.085	0.059	-0.042	-0.120	0.072	-0.065	0.363	0.272	-0.227		
Small	0.003	0.103	0.165	-0.156	-0.131	-0.215	-0.172	0.238	-0.214	-0.253	-0.510			
Large	-0.054	-0.069	-0.118	0.147	0.130	0.228	0.195	-0.182	0.193	0.333				
Age	-0.006	0.072	0.067	-0.106	-0.034	0.096	-0.058	-0.062	0.070					
Manuf.	-0.083	0.053	-0.036	0.055	0.004	0.219	0.097	-0.808						
Service	0.045	-0.011	0.016	-0.016	0.036	-0.167	-0.057							
Foreign	-0.015	-0.016	-0.021	0.026	0.121	0.274								
Export	-0.009	0.104	0.105	-0.083	0.008									
Big City	-0.090	-0.168	-0.224	0.315										
GDP Growth	-0.200	-0.179	-0.318											
GDP / Capita	-0.189	0.841												
Law	-0.419													

Wald Test for Total Sample:
F-statistic: 3.730
P-value: 0.001

Table A5.2 Heteroskedasticity Test

H_0: The residuals are homoskedastic.

H_1: The residuals are heteroskedastic.

	LM-statistic	P-value
Total	7.215	0.951
Top	12.604	0.479
Middle	48.548	0.000
Laggard	26.576	0.014

Top sample: (χ^2-distribution, 15 DF)
Sub samples: (χ^2-distribution, 13 DF)

Table A5.3 Specification Test

H_0: The model is correct specified.

H_1: The model is not correct specified.

	LM-statistic	P-value
Total	0.134	0.715
Top	0.400	0.527
Middle	7.289	0.007
Laggard	1.761	0.185

Top sample: (χ^2-distribution, 1 DF)
Sub samples: (χ^2-distribution, 1 DF)

Appendix 6

Estimation Output

Table A6.1 Top Reformers

Variable	Coefficient		S.E.
D Public	-0.414	***	(0.104)
D Small	-0.529	***	(0.059)
D Large	0.075		(0.072)
Age	0.001		(0.001)
D Manufacturing	0.066		(0.087)
D Services	-0.018		(0.085)
D Foreign	-0.135		(0.079)
D Export	0.096		(0.062)
D Big City	-0.173	**	(0.059)
GDP Growth	-1.712		(1.581)
GDP per Capita	0.000		(0.000)
Rule of Law	0.216		(0.170)
Inflation	-0.968		(1.042)
C	0.015		(0.174)
Effron's R^2	0.054		

*: p<0.05; **: p<0.01; ***: p<0.001

Table A6.2 Middle Reformers

Variable	Coefficient		S.E.
D Public	-0.590	***	(0.165)
D Small	-0.429	***	(0.087)
D Large	0.273	**	(0.097)
Age	-0.004		(0.003)
D Manufacturing	0.298	**	(0.112)
D Services	0.202		(0.108)
D Foreign	-0.113		(0.107)
D Export	0.183		(0.104)
D Big City	-0.257	***	(0.074)
Labor Productivity	6.773	***	(1.718)
GDP Growth	0.000	*	(0.000)
GDP per Capita	0.949	***	(0.222)
Rule of Law	2.831	**	(1.046)
Inflation	-0.570		(0.250)
C	0.084		(0.165)
Effron's R^2	-0.590		

*: p<0.05; **: p<0.01; ***: p<0.001

Table A6.3 Laggard Reformers

Variable	Coefficient		S.E.
D Public	0.083		(0.079)
D Small	-0.557	***	(0.084)
D Large	0.419	***	(0.068)
Age	0.000		(0.002)
D Manufacturing	-0.121		(0.129)
D Services	-0.177		(0.128)
D Foreign	-0.272	**	(0.091)
D Export	0.141		(0.082)
D Big City	-0.343	***	(0.061)
Labor Productivity	4.095	*	(2.047)
GDP Growth	0.000	***	(0.000)
GDP per Capita	2.155	***	(0.300)
Rule of Law	6.784	***	(1.458)
Inflation	-0.226		(0.270)
C	0.083		(0.079)
Effron's R^2	0.099		

*: p<0.05; **: p<0.01; ***: p<0.001