Securities Laws and Regulation and Stock Market Development in Transition Economies

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Abstract

We study the impact of specific suitably disaggregated indices of securities market laws and regulation on various measures of securities market development in a sample of 19 transitional economies. Our legal indices are based on available securities regulations data from the 1999 EBRD Legal Indicator Survey. The results indicate that securities regulations affect stock market development positively and significantly through stricter regulation of financial disclosure and market intermediaries. We also find that it is the implementation (effectiveness) component of disclosure and regulation of intermediaries which drives the result. Other elements of stock market law and regulation, such as enforcement powers of the Securities Regulator or its attributes, are largely irrelevant for stock market performance. These results echo recent evidence in the comparative literature, which finds that private enforcement through stricter disclosure requirements and liability rules is associated with better securities market development.

Keywords: securities law, securities markets, regulation, enforcement, institutions

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1 Introduction

Stock markets play an important role in the financial system. The provide a way for companies to raise external finance. This allows financially-dependent firms to grow faster, given the limits on other sources of finance such as bank credit and internal finance. Importantly, better stock market performance is associated with higher growth rates. For example, Levine and Zervos (1998) report that stock market activity, as measured by the turnover ratio, is positively associated with future economic growth. Having well-developed stock markets reduces the risks of a credit crunch as firms become less dependent on bank financing. Furthermore, having a financial structure with more equity and less debt reduces the risks for firms in the case of an economic downturn. Equity markets may also bring benefits in the form of stronger governance of firms' managers and companies investment decisions. Recent empirical evidence suggests, e.g. Beck and Levine (2002), that overall financial development and the efficiency of the legal system rather than financial system structure (bank-based versus market-based) affect future economic growth.

Theoretical research also predicts an important role for well-functioning and vibrant stock markets in alleviating market risks and allowing investments in long-run projects to take place. For example, Levine (1991) finds that more liquid stock markets reduce investors' disincentives to invest in longer-term projects because they can easily sell their stake in the project should they need their savings before the project matures. Other models, e.g. Devereux and Smith (1994) emphasize risk sharing in internationally-integrated stock markets. Such risk-sharing induces a shift from low-risk, low-return investments to high-return investments, thus enhancing productivity growth. While some theoretical studies, e.g. Shleifer and Vishny (1986), caution against market liquidity by arguing that higher liquidity makes it easier to sell shares, and thereby reduces shareholder incentives to monitor firm management, with negative repercussions on productivity and growth, the empirical evidence does not find that market liquidity reduces productivity or growth. Altogether, the recent empirical research on the links between stock market development and performance and economic growth lends support to the theories that equity markets enhance productivity in the economy and economic growth.

A large share of the transition economies have now functioning stock markets. Most stock exchanges were established in the early to mid-1990s, and in one group of transition countries served as a mechanism to transfer ownership in the process of privatization[1].

Today, stock markets in transition are still largely under-developed. Some of the small stock exchanges have already merged with larger, regional exchanges – for example the Estonian and Latvian stock exchanges merged with the Helsinki Stock Exchange in 2002. On many of the transition stock markets liquidity and capitalization remain low, even by emerging market standards. Some countries such as the Czech and Slovak Republics, which developed their markets in the

[1] See Claessens, Djankov and Klingebiel (2000) for a discussion of the origins of transition stock markets.

early 1990s through mandatory privatization-related listings, experienced delisting of companies in the second half of the 1990s as liquidity and disclosure requirements were enhanced. The volume of initial public offerings (IPOs) in recent years is low even in the more advanced transition stock markets. For example, only the Slovene and Polish stock markets recorded a reasonable volume of IPOs during 1999-2002. Thus, the Ljubljana Stock Exchange recorded 111 newly-listed domestic companies during the period from 1999 to 2002 in cumulative terms. The corresponding figure for the Warsaw Stock Exchange was 55 newly listed domestic firms. In contrast, the Prague Stock Exchange saw only 2 IPOs during the same years – by one domestic and one foreign company; the Bratislava Stock Exchange saw 7 newly-listed firms, and the Tallinn Stock Exchange only 1 newly-listed domestic company. IPO activity was also low elsewhere in Central and Eastern Europe and the CIS countries.

There are conflicting views about the role of stock markets in transition. Some scholars make the observation that most advanced transition economies have now developed bank-based financial systems, e.g. Berglof (2002). According to this view, transition stock markets are going to be subjected to competition from larger regional markets, which offer better disclosure and attract large transition companies. The small market size in many transition economies is also not conducive to securities market development. Furthermore, companies in transition economies are characterized by ownership concentration, which drives firms off the stock market as they become 100% owned by a single owner.

Despite these arguments, in this paper we investigate whether provisions of securities laws and their enforcement across a cross-section of 19 transition countries affect their stock market development.

2 Literature Review

This paper follows some recent contributions to the growing literature on law and finance, such as La Porta, Lopez-de-Silanes and Shleifer (2003), and on the role of institutions in economic development, e.g. Djankov et al. (2003). Law and finance research in the past several years has been instrumental in explaining differences across countries in corporate governance, financial structure and economic growth.

In a recent paper La Porta et al. (2003) study the effect of securities laws on stock market development in 49 countries. They discuss three distinct theories about the role of securities laws. Under the first one, associated with the work of Coase (1960) and Stigler (1971) a securities law in not needed to address informational asymmetries between buyers and sellers of securities. According to this view, securities issuers have an incentive to reveal all available information about the company because if they fail to do so, investors would assume the worst and not invest. Since there are verification costs associated with ascertaining whether disclosure is complete and accurate, the market creates its own solution in the face of securities market intermediaries such as auditors, accountants and underwriters, who can vouch for the quality of the securities

being offered. They are motivated to act honestly because of reputational reasons and in order to avoid liability. Therefore, market participants' incentives and general contract law would be sufficient to overcome existing informational asymmetries and issuers incentives to cheat. Under the second and third theories securities laws matter because incentives to cheat are high and verification and private litigation are costly. The authors distinguish between two schools of thought about how securities laws should be used. They define the *private enforcement* mechanism of securities regulation as one where the main benefits of a securities law come from reducing the costs of private contracting. Thus, a securities law allows for standard contracting and serves to clarify liability for incomplete or inaccurate information disclosure. In this manner the law reduces investors' costs of enforcing a securities contract in court. Under the so-called *public enforcement* mechanism private enforcement is insufficient and a public enforcer of securities laws, such as a securities commission (regulator) is needed. Public enforcement is expected to work if the securities regulator is independent and honest, well-funded, empowered to introduce regulations, elicit information, and impose sanctions for violations of securities laws.

La Porta et al. (2003) argue that disclosure requirements and liability rules are crucial features of private enforcement. The authors conduct a survey of one law firm per country, and collect data on various aspects of securities laws. The data are summarized in several key index measures. For example, six proxies of the strength of disclosure requirements are constructed. These are whether a prospectus is delivered to investors ahead of securities issues; whether the company must disclose insiders' compensation; ownership by large shareholders; inside ownership; contracts outside the normal course of business; and transactions with related parties. The index of disclosure requirements is an average of these six proxies. In addition to these specific disclosure requirements, it is common to have a requirement, whereby the prospectus needs to include all material information necessary to assess the value of the securities being offered. However, when bad news hits the company after it has issued securities, the question becomes whether this information was known or knowable to the issuer, distributor and/or accountant, and the burden of proof in this case determines how easy it is for investors to recover damages if information in the prospectus was misleading or omitted. La Porta et al. (2003) distinguish four different liability regimes[2]. Public enforcement is also coded and sub-indices of Supervisor

[2] One possibility would be for the plaintiff to demonstrate that the issuer, distributor or accountant was negligent in leaving information out of the prospectus. In addition, under this regime the investor has to prove that he relied on the information given in the prospectus in their decision to invest (reliance) and that his losses are due to the information provided in the prospectus (causality). Under the second liability regime, plaintiffs need to prove gross negligence on the part of the issuer, distributor and /or accountant. Therefore, this regime is harder for plaintiffs than the first one. Under the third liability regime, plaintiffs must prove reliance and causality, but not negligence. Therefore, the burden of proof is lighter in this case. Finally, the fourth scenario calls for plaintiffs to merely prove that the information provided in the prospectus was misleading, without proving reliance on the prospectus to invest, or causality between the information provided and incurred losses. In the latter case the burden of proof shifts from plaintiff to defendant: the defendant must prove that he exercised due diligence in preparing the prospectus.

Attributes, Investigative Powers of the Supervisor, Orders and Criminal Sanctions. La Porta et al. (2003) combine the sub-indices of disclosure and burden of proof into an aggregate index of private enforcement, and their cross-country econometric analysis finds that the private enforcement index rather than the public enforcement one, is significantly associated with better securities market performance.

The idea that legal factors help explain stock market development is part of the general law and finance comparative literature. For example, La Porta et al. (1997) examine what determines stock market capitalization in 49 countries, and find that corporate laws – as encompassed by the legal index of Shareholder Rights – as well as belonging to a given legal origin (family) are statistically significant determinants of stock market development. That paper, however, does not focus on securities laws but only on certain provisions of the corporate (company) laws, which shape minority shareholder protection from managerial and dominant shareholder expropriation.

The relevance of laws for securities market development has also been addressed in the comparative law literature. Black (2001) examines the preconditions for successful securities markets from a legal perspective. He draws up lists of legal provisions and institutions necessary to a) resolve problems of asymmetric information in securities issuance, and b) mitigate moral hazard problems after securities have been sold, i.e. that company managers and controlling shareholders have an incentive to cheat investors out of the value of their investment. Among the most important provisions of the law and institutions to reduce informational asymmetries – according to Black – are good financial disclosure; reliable accounting and audit rules; an effective securities regulator; presence of securities market intermediaries such as accountants, underwriters, auditors; sufficient company and insider liability. To counter expropriation by insiders, insider dealing rules are listed as particularly important alongside most of the provisions just mentioned for controlling asymmetric information.

Glaeser, Johnson and Shleifer (2001) focus on securities laws and regulations in two transition economies - Poland and the Czech Republic. The authors draw a comparison between the two countries in terms of their securities market regulation in the 1990s. They argue that government regulation of capital markets may be preferable to private enforcement in the presence of a weak judicial system. The authors find that stringent capital market regulations in Poland (as encompassed in its company and securities laws) have stimulated the development of the stock market and led to many new firms to go public. In contrast, the lax and poorly enforced capital market regulations in the Czech Republic have brought about stagnation of the stock market, delisting of a lot of privatized companies and practically no new listings. The Czech Republic has also seen rampant expropriation of external investors.

The La Porta et al. papers on law and finance do not cover the transition economies. The link between legal text, legal enforcement and finance in transition economies is explored by Pistor, Raiser and Gelfer (2000). The authors use coded data for shareholder and creditor rights, based on these jurisdictions' laws

on the books from 1992 to 1998.[3] They follow the basic approach of La Porta et al.(1998) in constructing indices of shareholder and creditor rights, but extend the La Porta et al. indices to cover additional aspects of shareholder protection of particular concern to transition countries.[4] The authors also use an index of stock market integrity (SMINTEGR), which does not cover the individual protection of shareholders but rather captures the presence of legal rules on insider dealing, on an independent share registry and stock market supervision. Some of the legal indices which we employ in this paper are similar in essence to their stock market index, and later we report the degree of correlation between our measures and SMINTEGR.

To measure legal implementation Pistor et al. (2000) employ three separate proxies for legal enforcement - the rule of law index published by the Central European Economic Review; the EBRD survey-based index of corporate and bankruptcy law effectiveness (which is derived on the basis of the EBRD Legal Indicator Survey, used for all the legal variables in this paper); and an enforcement index based on the World Business Environment and Enterprise Performance Survey for 20 transition economies. The econometric analysis of both stock market and banking development reveals that legal enforcement, but not legal text, is statistically significant for explaining stock market and private credit volume. Unlike in La Porta et al.(1997) "the law on the books" in transition is not found to be significantly associated with measures of external finance. Methodologically, the authors conduct OLS and instrumental variable estimations of stock market capitalization over GDP (averaged over 1997 and 1998), and include the rule of law measure (as a proxy for legal effectiveness), and each of the six indices of shareholder protection among the explanatory variables. They also control for method of privatization to account for increase in listed firms and capitalization due to mandatory listing of privatized firms. All estimations of stock market performance reveal that legal effectiveness is significantly associated with larger and more liquid stock markets (market turnover is also used as a dependent variable).

A study by Claessens, Djankov and Klingebiel (2000) focuses on the determinants of stock market development in the transition economies. The authors conduct OLS regression analysis, and after controlling for income per capita and geographical distance to Western Europe, establish that low levels of inflation, adequate shareholder protection and the size of institutional investor assets are

[3] The methodology of the codification of shareholder and creditor rights in the transition economies as well as an extensive analysis of the changes in their corporate laws is provided in Pistor (2000).

[4] For example, they add to the LLSV shareholder index measures of VOICE and EXIT. The former refers to corporate control within the company and comprises all the LLSV shareholder rights measures plus other measures of the ability of shareholders to assert their control over the management. The latter pertains to the rights of shareholders to liquidate their holdings in a company when dissatisfied with the way it is managed. In addition, the authors use ANTIMANAGE and ANTIBLOCK indices to determine how the legal system deals with the conflicts between management and shareholders, and blockholders and minority shareholders. For instance, cumulative voting rights, pre-emptive rights of current shareholders in case of new share issues, quorum requirements are all examples of indicators, supportive of the rights of minority shareholders when strong blockholders are present.

all significant determinants of stock market capitalization and turnover. Their paper discusses the origins of stock markets in transition countries, and also outlines prospects for future development. Among the study's important features are stressing the role of institutional investors such as insurance companies and pension funds; employing threshold inflation effects in the estimations of the determinants of market capitalization and turnover; and underscoring the positive relationship between private credit and market capitalization in the transition economies.

In the present paper we would like to empirically test how securities laws and their enforcement affect stock market capitalization and turnover in a sample of 19 transition economies. In so doing, we will test the La Porta et al.(2003) results about the role of securities laws for the sample of economies in transition. The present study differs from Pistor et al.(2000) in the fact that it utilizes survey-based legal data, whereas their paper employs measures of legal investor protection, derived from coding the written laws in 24 transition economies. Instead, we are using legal indices of perceived extensiveness and effectiveness of law based on attorney opinions about securities laws in their respective jurisdictions.

The paper is organized as follows: Section 3 presents the data and the main legal indices which we use. Section 4 discusses methodological issues, the model specification and estimation techniques that we employ. Section 5 presents the results of the estimations, section 6 offers robustness checks, and section 7 concludes.

3 Data

3.1 Securities Markets Laws and Regulations

3.1.1 Disclosure Requirements and the Legal Indicator Survey

The legal measures we use to assess equity market development in Eastern Europe and the former Soviet Union are generated through the a survey of lawyers (Legal Indicator Survey, or LIS hereinafter) run by the EBRD since 1997 to assess legal reform in transition economies. We have at our disposal the raw survey data for 1999, which covers five main areas of law: company law (corporate governance), bankruptcy law, pledge (secured transactions) law, banking law, securities law. In addition, the survey always had a sixth section devoted to issues of legal enforcement (called General Legal Effectiveness). A hallmark of the LIS is the focus on both the extent of the law, and on how the law is used. The survey questions are divided into two categories: measuring extent or scope of the law (extensiveness questions), and measuring the implementation or use of the law (effectiveness). Questions are weighted according to underlying economic theories about desirable legal norms, or following so-called "best practice" laws. The banking and securities law sections of the survey were added to the main questionnaire in the summer of 1998 during the work for Transition Report 1998. Over the years of implementation of the survey the

EBRD published scores of legal extensiveness and effectiveness, based on the LIS survey scores, but also incorporating expert legal judgments in cases where respondents provided contradictory information. The scores were usually also scaled on a rating scale of 1 to 4, with increments of 1. The baseline scores used were derived as the average of a survey respondent's answer to all questions. A country's legal score is derived as the average of all responses from attorneys from that country.

A novel feature of the use of the LIS data in this paper is related to 1) using equal weights for all questions (this differs from the EBRD approach where some questions received higher weights); 2) the legal data have been subjected to an extensive review and cleaning, which has resulted in some differences between the previously published scores and those used in this paper. For instance, coding errors were corrected; internal inconsistencies in question answers were eliminated in a systematic fashion; and missing answers, which had previously been coded as zero values, have now been excluded when aggregating question scores.

Let us now turn to the Securities Markets section of the Legal Indicator Survey. What information does the survey elicit from respondents, given the first problem of securities issuance, i.e. the problem of asymmetric information between issuers and investors? As we have seen above, disclosure of financial information, which enables potential investors to judge the health of the company and its future prospects is essential. One of the first things the survey section on Securities Markets asks is about disclosure and transparency. For example, six of the 29 questions in this section are concerned with how good and effective disclosure requirements are.

Thus, an extensiveness question Q5 asks whether publicly traded companies must provide timely and accurate financial results and other information to the public, and a related question, Q6, asks how often such information is in fact provided, thereby measuring the perceived effectiveness of the disclosure rule. Note that in this case the question refers to a situation after such securities have been issued. Two aspects of such information provision are sought: both that the information is factually correct and complete, i.e. there is no misleading or omitted information, and second, that it is provided to investors and the general public at large in a timely fashion, i.e. once every quarter, etc. As discussed earlier, one of the core pre-conditions for countering the information asymmetry involves good accounting and auditing rules designed to provide information useful to investors. Q7 attempts to measure exactly that. It asks the lawyers to tell us whether publicly-traded firms must use international accounting standards when preparing their financial statements. Use of international accounting standards is thought to be desirable, especially since the transition economies had no proper accounting standards to begin with. The next question, Q8, is about the transparency of securities transactions. It asks about the existence of a properly functioning clearance and settlement system for both shares and bonds, assigning equal weights to both[5]. When such a system is in

[5] Here we maintain the internal question weights originally assigned by the EBRD Legal

operation trades can be recorded and those records made available to investors. Black (2001) lists similar market transparency rules such as recording the time, quantity and price of trades as one of the core institutions to control asymmetric information. He comments that large investors often try to hide their transactions to reduce the price impact of their trades. Large stock exchanges, however, sometimes have the power to require that all trades be reported to them. More generally, however, the government needs to mandate prompt reporting of transactions and their entry into a single, consolidated source. Finally, Q8 and Q9 of the Securities Markets section deal with disclosure requirements prior to securities issue. One half of the question weight is assigned to an affirmative answer to the question whether filing of information with the Securities regulator before issuance is required by the law, and whether the information provided exceeds or falls short of that given in the issuing company's annual report. These parts arguably refer to the extensiveness of the law. Another half of the question weight of 1 is awarded to a mandatory filing of both a prospectus and financial statements, with the prospectus given a three times higher weight than financial statements, and both considered complements. The importance of the prospectus is discussed by both Black (2001) and La Porta et al. (2003). Financial statements can obviously augment the financial information provided in the prospectus. La Porta et al. (2003) stress the importance of delivery of the prospectus to investors, and Q9 focuses on delivery of the information (prospectus, financial statements and other) to the securities market regulator prior to issuance. That part of the question asking about the form of information disclosure was previously considered an effectiveness question. We choose to treat it as an extensiveness question since it relates to the provisions of the law regarding delivery of prospectus and financial statements rather than their enforcement. And finally, an effectiveness question, Q10, asks how often the regulator does in practice approve of the information disclosed before a securities issue.

While, the survey omits disclosure requirements regarding director compensation, ownership by large shareholders, insider ownership, etc. as coded by La Porta et al. (2003), it does focus on some of the crucial aspects of information disclosure aimed at mitigating asymmetric information between securities issuers and investors.

We average the six LIS questions on disclosure requirements to get a subindex of Disclosure Rules (DISCL), and look at it in its aggregate as well as broken down into its extensiveness (DISCL_EXT) and effectiveness (DISCL_EFF) components.

3.1.2 Effective Supervision and Regulation of the Securities Market and the Legal Indicator Survey

As pointed out by Black (2001) and La Porta et al. (2003), it is essential to have honest, well-funded securities regulators, who have the expertise and budget to

Transition Team to the survey answers. In most cases the origninal internal weights have been maintained in generating the legal indexes used in the paper.

handle complex securities disclosure cases. Funding of securities regulators is often a big problem, particularly in developing countries. Very often the salaries are too low to retain qualified staff. La Porta et al. (2003) look at securities regulators as the main government agency or official authority charged with supervising the securities market, and thereby acting as the public enforcer of securities' rules. Under the public enforcement view, even with a securities law, private enforcement incentives are not strong enough to elicit honest behavior from issuers, and therefore a public enforcer, e.g. a Securities Commission, is needed to make sure that the securities law is complied with. La Porta et al. (2003) argue that public enforcement could be beneficial when the enforcer is politically independent and focused on securities markets only; when it can introduce regulations of market participants; when it is be well suited to elicit information from market participants and finally because it can impose sanctions on market participants. Each of these four aspects of public enforcement through a securities market regulator is carefully coded using the available data.

The securities markets section of the Legal Indicator Survey contains several questions which refer to the Securities Regulator. For example, the first 4 questions of this section, Q1 to Q4 are combined under the rubric Supervision and Regulation. Of these Q2 and Q3 are the most interesting. Q2 asks whether a government agency or an independent body exists and is in charge of securities markets regulation. An affirmative answer, regardless of the degree of independence of the Regulator, gets the full weight score of 1. Obviously, it makes a great difference if the regulator's staff members are appointed unilaterally by the government, or not; and how can they be dismissed – following due process, or unilaterally by the Executive. The survey does not allow us to fine-tune the degree of independence, but rather assumes that respondents know what an independent Regulator means. Q3 refers to the investigative powers of the Regulator — it asks respondents whether the Regulator has the mandate to conduct on-site examinations of securities issuers, presumably to investigate information provided with the offering documents. Whenever inaccurate information is provided by the issuers, accountants or underwriters, the question arises why such information was provided? Did the issuer, accountant or distributor have that information? Could they have had it? At what cost? Did the issuer hide relevant information from the accountant (auditor) and /or distributor? Finding the answers to all these questions is costly, and this is where the Regulator steps in. The Regulator can be empowered to command documents from issuers, accountants or distributors, and to subpoena witnesses. La Porta et al. (2003) summarize such powers into a sub-index of Investigative Powers of the Regulator. Clearly, the first part of Q3 is also trying to gauge the investigative powers of the Regulator, and like Q2, is an extensiveness question. The second half of Q3 asks whether the Regulator, if endowed with investigative powers, can use them in both the regulation of share issues and bond issues, i.e. the focus is on comprehensive regulation of the securities market as well as focused regulatory powers. La Porta et al (2003) also stress the importance of a focused Regulator. They argue that an effective securities regulator needs to stay focused on securities market only rather than on both

banking and stock markets. While Q3 does not rule out banking regulation, an affirmative answer to both regulation of share and bond issues does imply a Regulator focused on the securities market only with comprehensive powers of investigation. The information gathered in Q29 of the Capital Markets section of the LIS is also linked to the attributes of the Regulator. This question asks whether trained and knowledgable staff work in the agency charged with regulation of securities markets (the first half of the question asks the same about bank regulation). An affirmative answer to this question, is awarded 0.5 weight, and the question is contributing to the total effectiveness score. Presumably, the better staff the Regulator has, the more effective its work and hence the enforcement or effectiveness of securities regulation would be. We consider this question, as part of the Regulator's attributes, which define its independence, focus and investigative powers. Finally, Q1 and Q4, previously included under the rubric of Supervision and Regulation, are considered less important and will be omitted from the analysis[6]. Q1 asks whether securities laws or regulations have been enacted or amended over the preceding 8 years, i.e. since 1991. An affirmative answer gains a score of 1 and counts toward legal extensiveness. Q4 asks whether securities can be sold through other mechanisms than a stock exchange. It is an effectiveness question on a 5-point rating scale, which awards higher scores if this happens regularly. Presumably, expanding the opportunities for trade is considered beneficial for market participants. However, it is not very obvious how beneficial over-the-counter trade could be in most transition countries, where securities markets are not very well developed. Therefore, we choose to treat these questions with caution, and to exclude them from the Regulator Attributes and Powers of Investigation sub-index (an average of Q2, Q3, and Q29b).

3.1.3 Enforcement Powers of the Securities Regulator and the Legal Indicator Survey

A separate rubric of the Securities Markets section of the survey is devoted to the enforcement powers of the Regulator. Q11 for example asks whether the Regulator has enforcement powers. Clearly, the question assumes that the lawyers understand what such enforcement powers are. The second part of the question in fact helps to outline these enforcement powers. Respondents are asked whether the Regulator is empowered to revoke an issuer's listing, and to impose civil fines or penalties in cases of non-compliance with securities rules. Existing civil liability of issuers scores higher than authority to delist. Both are non-criminal sanctions for violations of securities law. Affirmative answers to all parts of Q11 gain a score of 1, and count towards extensiveness (previously this was considered an effectiveness question, which we consider inappropriate since the question refers to law content rather than enforcement). Q12 asks whether the Regulator has engaged in oversight or enforcement action over the preceding

[6] Such omissions, done at a later stage than the cleaning of the data, are another source of differences between previously published legal scores and indices based on the LIS, and those in this paper.

5 years, to see how much enforcement has occurred in practice. An affirmative answer scores 1 and also counts toward effectiveness. Similarly, La Porta et al. (2003) also review the powers of the Regulator to impose civil sanctions on securities market participants. These sanctions include orders on public firms' directors to amend non-compliance with disclosure requirements, to institute changes recommended by outside reviewers and to compensate investors for their losses. They track whether or not such sanctions may be imposed on issuers, accountants and distributors alike, and average the scores into a sub-index of "Orders". While their analysis is more detailed and focuses on various market players, the information gathered by Q11 and Q12 of the Legal Indicator Survey captures the same notion.

Q13, Q14 and Q15 are all concerned with insider trading. These questions try to gauge the enforcement powers of the Securities Regulator. They are also one of the essential institutions to control self-dealing by insiders (insider dealing or trading is defined as trade between company insiders and less informed investors, in which the insiders use information about the company not known to the other investors). As discussed earlier, e.g. Black (2001), one of the ways to control insider trading is to have securities or other laws which prohibit insider trading, and to ensure that such laws are enforced. All three survey question are designed to assess this in the transition economies. An affirmative answer to Q13 is awarded with a score of 1. Q14 asks through what kind of a normative act is insider trading prohibited, and assesses whether there is a comprehensive ban through law – both private and criminal – as well as through administrative rules and stock exchange rules. If there is a law, a securities law or other, which bans insider dealing, then suits on insider dealing can be filed before the courts. Any administrative rules, issued by the government, also need to help eliminate insider trading. Stock exchange rules and charters should also complement the law and discourage insider trading. Finally, criminal liability and sanctions could also be sought in cases of insider trading. La Porta et al. (2003) list and code criminal sanctions against violators of securities laws alongside civil sanctions. The prevailing view in today's thinking about securities laws is that they should impose criminal liability on issuers, accountants and distributors for certain violations of the law. By asking whether a criminal law bans insider trading, the Legal Indicator Survey assumes that such criminal liability may be sought in cases of insider trading. Both Q13 and Q14 count toward Capital Market extensiveness.

Finally, Q15 asks how often the Regulator uses his enforcement powers to penalize cases of insider dealing or fraud. Thus, this question seeks to assess how well insider trading rules and laws are enforced. Enforcement makes violators learn that they cannot violate these rules with impunity. Some of the literature also links enforced insider trading rules with stock market performance. For example, Bhattacharya and Daouk (1999) report that many countries have laws prohibiting insider trading, but only in few of them are these laws enforced. Enforced insider trading laws are found to have a significant effect on share prices, whereas unenforced insider trading rules do not affect share prices. Hence, all indications are that Q15 is particularly important. It is an effectiveness question

and is rated on the previously discussed 1 to 5 scale, with higher frequencies awarded higher scores.

3.1.4 Regulation of Securities Market Intermediaries and the Legal Indicator Survey

A separate section of the Legal Indicator Survey, comprising 12 questions, is concerned with securities market intermediaries (also known as reputational intermediaries), investment and pension funds, and some other features of the securities market. The importance of market intermediaries such as accountants, auditors, investment bankers serving as underwriters and distributors of securities, is underscored by Black (2001) and others as one of the core institutions to solve the information asymmetry between securities issuers and investors. A sophisticated accounting and investment banking profession with securities laws defining liability by each if they endorse misleading or wrong information, is a core institution to counter asymmetric information. Furthermore, Black (2001) lists mandatory licensing of reputational intermediaries as well as their being subject to self-regulation as extremely useful in facilitating good financial disclosure. He also considers the presence of investment funds as a positive feature of the securities market, enhancing good disclosure and providing investable funds. In this regard, the information which the LIS attempts to collect falls very much under the realm of these arguments. For example, Q17 asks whether securities laws regulate the conduct of securities market intermediaries such as brokers and dealers; whether intermediaries are subject to mandatory licensing before they begin operation, and whether licensing is based on certain minimum standards and professional qualifications. An affirmative answer to the third sub-question is thought twice as important as an affirmative answer to the first two parts. This is in line with Black's points about the preeminence of a sophisticated and competent accounting, investment banking and securities lawyer professions as a core institution. The terms brokers and dealers, as used by the LIS, subsume accountants, auditors, investment bankers, lawyers and others who are engaged as intermediaries in the sale of securities between the issuers on one end and the investors on the other. Q18 asks whether any intermediaries have had their licenses revoked by the Regulator or by any other self-regulatory organization. This is an effectiveness question, measured on a 1 to 5 rating scale, aimed at evaluating to what extent the enforcement powers of the Regulator or other self-regulatory organizations work in practice. While Q17 counts toward Capital Market extensiveness, Q18 contributes toward effectiveness. Q19 asks whether securities market intermediaries are subject to mandatory self-regulation. As discussed above, self-regulation can serve as a useful complement to the core institutions ensuring honest behavior by the intermediaries in endorsing a company's financial disclosure. It is an effectiveness question, which scores highest points when self-regulation over intermediaries exists.

Four questions (Q20 to Q24) refer to the existence of collective investment schemes, defined as investment funds (mutual funds) or funded pension funds.

Their existence, and the existence of private schemes is regarded as beneficial for the securities market. Both pension and investment funds provide market liquidity and require good financial disclosure. Therefore, they can be a useful institution to have in order to counter information asymmetries in the securities market. Furthermore, Q21 asks whether separate rules and regulations govern the licensing of investment and pension funds. This would impose checks on them and make it mandatory that they themselves disclose information material to investor's decisions. Q23 asks precisely that – whether issuers of securities by investment or pension funds must disclose financial information to investors. Q22 then gauges whether the information provided by investment and pension funds to investors is accurate, i.e. whether financial disclosure by them is good and well enforced. Questions Q20 and Q21 are extensiveness questions, whereas Q22 and Q23 were previously considered effectiveness questions. However, while Q22 gauges enforcement of disclosure rules regarding investment funds and pension funds, it is not so obvious whether Q23 does that too. It just refers to the securities or other law or rule which describes what type of information should be disclosed by investment and pension funds. Therefore, we choose to treat it an extensiveness question instead.

Three questions in the Securities Markets section of the Legal Indicator Survey relate to investor compensation in the event of losses incurred as a result of a failure of a market intermediary. La Porta et al. (2003) stress the importance of civil liability and the ability of the Regulator to make issuers or other intermediaries compensate investors for their losses following non-compliance by the issuer or the intermediary with mandatory disclosure requirements. Q24 for instance asks whether provisions in the securities law are in place whereby investors get compensated for their losses after failure (we assume insolvency) of a market intermediary. The question should be interpreted more broadly to include also compensation for investor losses after failure to ensure good disclosure by the issuer. Q25 then asks whether such failures have happened in the preceding three years (1996 to 1999) and Q26 asks whether in these cases investors did receive compensation. All three questions were previously considered effectiveness questions. Since Q25 is concerned more with an outcome rather than a legal rule, we remove it from the legal indices used in the following analysis. Instead we will use the information provided for Q25 as one of the variables on securities market performance. An affirmative answer to Q24 is awarded 1 point, and Q26 is measured on the usual 1 to 5 rating scale about the frequency of investor compensation.

Finally, Q27 asks about the existence of a shareholder depository. The existence of a law governing this, and its operation in practice are given equal weights, and contribute to capital market extensiveness and effectiveness respectively. The existence of a shareholder depository is useful in bringing about market transparency about shareholdings and trades. Thus, it is thought to be an institution enhancing good disclosure and facilitating the resolution of asymmetric information. One last question under the rubric of Regulation of Securities Market Intermediaries asks whether a functioning stock exchange exists in the respondent's country. The information provided as an answer to

this question can serve two purposes. First, it captures the existence of a stock exchange as a reputational intermediary in its own right. Indeed, Black (2001) lists stock exchanges with their listing rules and ability to enforce them as one of the main reputational securities market intermediaries. Both exchanges and investors understand that false disclosure by a member will affect the reputation of all listed members. Reputational concerns make the stock exchange enforce its listing standards. So, the survey included this as an effectiveness question, scoring 1 point for an affirmative answer. However, a second interpretation is also possible. It can be argued that this question does not measure how well the law is enforced, but rather measures an outcome of how good the law or its enforcement are. Therefore, in following sections we remove this question's answer scores from the legal indices and use it as an outcome variable instead.

3.2 Cross-Country Comparisons

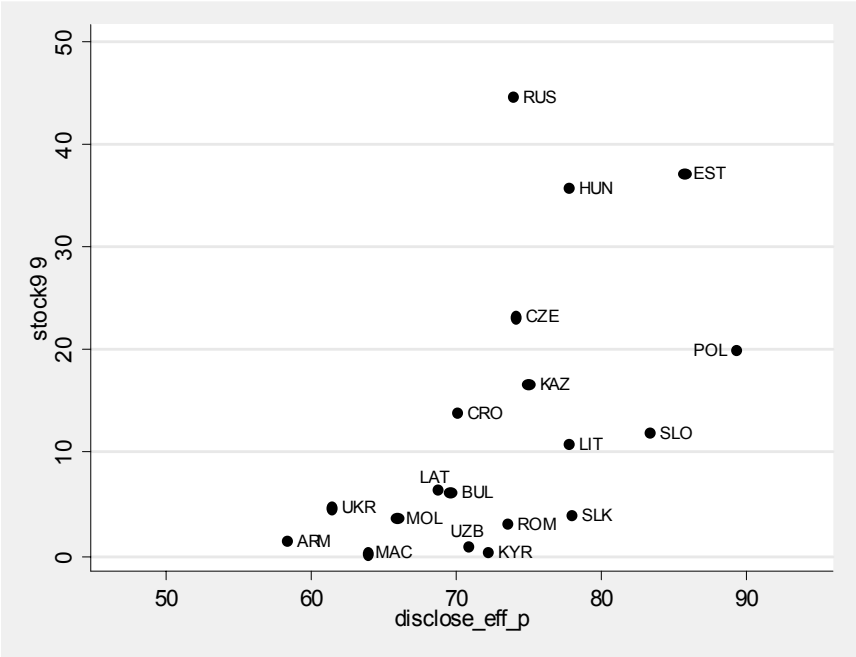
Now that we have discussed the rationale for securities laws and regulations, and the main features of these laws captured by the securities law section of the Legal Indicator Survey, let us turn our attention to a discussion of the four main measures of securities laws. We look at each sub-index overall, and broken down into its extensiveness and effectiveness components.

3.2.1 Disclosure Requirements

We first compare the differences in disclosure requirements. The top-ranking countries in the overall measure of disclosure requirements are Estonia, Poland, the Slovak Republic, Slovenia, and Hungary. The lowest-ranking ones are Georgia, Armenia, Ukraine, Kyrgyzstan and Azerbaijan. Surprisingly, Kazakhstan ranks among the top six countries in the stringency of disclosure requirements and the Czech Republic ranks rather low, below the other Central European countries, and with scores similar to those of Albania, Uzbekistan and Belarus. What explains these rankings?

Our results on differences in securities laws with respect to disclosure requirements for issuers of securities are in line with the findings of Glaeser, Johnson and Shleifer (2001) about differences in securities regulation between Poland and the Czech Republic in the 1990s. They find that issuers and intermediaries in the two countries faced radically different disclosure requirements, and therefore the two securities market regulators had very different access to information on market participants. The authors compare the Czech and Polish securities laws in terms of regulation of issuer and requirements for financial and ownership disclosure, and establish that Polish securities law imposed much more extensive and stringent requirements for disclosure of issuers' financial and ownership information than Czech law did. For example, in Poland the introduction of securities to public trading required both permission by the regulator and the issue of a prospectus. In the Czech Republic the securities law required neither of these features. Both laws prohibited the reporting of false information in a company prospectus. Polish law required the reporting of monthly, quarterly,

Figure 1: Stock Market Capitalization and Disclosure Requirements Effectiveness Sub-index



semi-annual and annual financial statements by issuer; the Czech law mandated only annual reports. Furthermore, Polish law obliged issuers of securities to publish all information material to investors' decision; Czech law mandated only disclosure of significant adverse developments in the company's business. Glaeser et al. (2001) also compared ownership disclosure. They again found that the Polish law required more extensive ownership disclosure. For instance, it required public disclosure each time a shareholder exceeded 10, 20, 33, 50, 66 and 75 percent ownership. This is helpful in preventing expropriation of minority shareholders by large shareholders and management. In addition, Polish securities law required issuers to report the owners with more than 10% ownership stake in two national newspapers; Czech law did not impose such a rule. Finally, Glaeser et al. (2001) compare how mandatory takeover bids are treated in the two countries' laws. They find that Polish law required any person who has become a holder of shares representing over 50% of the votes at the general meeting to announce an invitation to subscribe for the sale or exchange of the remaining shares. However, Czech law did not impose such a mandatory bid for a company's remaining shares whenever a 50% ownership threshold was exceeded. Such a mandatory takeover bid is a provision intended to reduce the risk of expropriation of minority shareholders.

These findings on the securities laws of Poland and the Czech Republic are supported by the data on disclosure requirements provided in lawyers' answer to the relevant questions of the Legal Indicator Survey. As mentioned above, Poland scores much higher than the Czech Republic in overall disclosure requirements. Indeed, Poland has the second highest score on the stringency of its disclosure requirements after Estonia. On the extensiveness of its Disclosure sub-index Poland also does better than the Czech Republic, but drops several places and ranks below Estonia, the Slovak Republic, Croatia, FYR Macedonia and Hungary. However, from the perspective of effectiveness of disclosure requirements, Poland ranks first among the transition countries. The value of its effectiveness of disclosure index (89.29) is considerably higher than the value of the Czech effectiveness of disclosure index (74.11). Therefore, the results on disclosure support Glaeser et al.'s findings about Polish law mandating better disclosure than Czech law.

Looking in more detail at some of the sources of these differences in favor of Polish disclosure regulation, we find that generally the Polish scores on individual questions on Disclosure are higher than the those of the Czech Republic. For example, all interviewed Polish respondents agree that publicly traded firms must provide timely and accurate information to investors (mean score is 1.00); not all Czech interviewees so agreed, but the mean is also very high (0.92). However, when asked about how often such disclosure occurs, Polish respondents say that on average it happens frequently or almost always, while on average Czech respondents say it happens only sometimes. The respective scores are 0.86 and 0.60 for Poland and the Czech Republic. This difference is consistent with the reported differences in the law by Glaeser et al (2001) that Polish law requires disclosure of all material information, while Czech law requires disclosure of significant adverse developments. Comparing the two from the perspective of reliability of the disclosed information, we find a significant difference in the mandatory use of international accounting standards. The Polish score is 0.57, the respective Czech one is 0.07. Almost none of the Czech lawyers thought that financial statements by issuers need to comply with IAS. In terms of transparency of deals, Poland also appears to be better: all Polish survey respondents confirm that a clearance and settlement system for both shares and bonds is in operation (mean score of 1.00), whereas not all Czech respondents say so about their country's clearance and settlement system (mean score of 0.77). The survey gathers information which could be compared with the information provided by Glaeser et al (2001) on requirements for prospectus and regulator permission to issue securities. They found that, while Polish law mandated both a prospectus and getting regulatory approval, Czech law did not mandate either. However, when asked whether issuers must file information with the Regulator prior to issue, almost all Czech and Polish respondents say that this is the case, and that the information provided should be more than that contained in the company's annual report. The Czech mean scores here are somewhat higher than those of Poland (0.25 and 0.19 for mandatory filing, and 0.25 and 0.21 for more extensive information being filed). Both these scores have a maximum of 0.25. Also, most Polish and Czech respondents consider a prospectus manda-

tory, but not financial statements. The mean scores here are marginally in favor of the Czech Republic too. This is somewhat surprising given the Glaeser finding that the Czech law does not require a prospectus while Polish law does. Moreover, when asked about the frequency with which the Regulator reviews and approves the information provided by a company before a public securities issue, Czech respondents also indicate a marginally higher frequency on average (mean score of 0.85 against 0.82 for Poland). Although these last results seem at odds with the findings of Glaeser et al. (2001), the overall ranking of disclosure requirements, whereby Poland scores consistently higher than the Czech Republic, captures the essence of the Glaeser et al (2001) finding that Polish law imposed much stricter disclosure rules than Czech law. We summarize the individual scores on disclosure in the Appendix tables.

3.2.2 Regulator Attributes

One of the main findings of Glaeser et al. (2001) is that the establishment of an independent Securities Commission benefited the development of the Polish securities market; the lack of an independent commission in the Czech Republic, who chose to supervise the securities market through the Capital Markets Supervisors Office in the Ministry of Finance – a body allegedly unconcerned with the regulation of the market – brought about stagnation in the Czech securities market. How are these conclusions borne out by the Legal Indicator Survey data on regulator attributes? Unfortunately, the survey information does not allow for a very detailed analysis of the pertinent regulator characteristics and does not specify all the detail provided by Glaeser et al. (2001). Nevertheless, some useful findings emerge. For example, while the Polish and Czech answers do not differ much from the perspective of whether a Regulator exists, and what its functional responsibilities are, the Polish Regulator is thought to have, on average, better trained and more knowledgable staff, than the Czech Regulator does. (mean score of 0.50 for Poland versus a means score of 0.42 for the Czech Republic). Otherwise, all Polish and Czech respondents agree that a government agency or an independent body charged with the regulation of the securities market exists (mean scores of 1.00 for both). In terms of regulator's focus, Polish respondents are marginally more likely to say that their Securities Commission regulates both the issue of shares and bonds than Czech respondents (mean score of 0.50 versus 0.48), but Czech respondents appear more confident that their regulator is vested with the powers to conduct on-site examinations and investigations of securities issuers than Polish respondents are (mean score of 0.50 against 0.43).

Overall, we do not find much of a difference in the Regulator Attributes sub-index (mean of 97.14 for Poland and 95.76 for the Czech Republic, with the Czech Republic having a slightly higher ranking on its extensiveness component (mean of 98.86 against 96.43), but Poland doing considerably better (indeed a t-test for differences in means indicates significance at the 10% level) in terms of the effectiveness component (mean of 100.00 for Poland against a mean of 83.33 for the Czech Republic). While these results do not give a full picture of other

potentially interesting regulator features such as how its staff are appointed or dismissed, and probably the survey questions are not well suited to give even a good notion of Regulator independence, we still find that the Polish regulator is reported to have better human resources, which is captured by the effectiveness score. This shows a good parallel with the Glaeser et al. results.

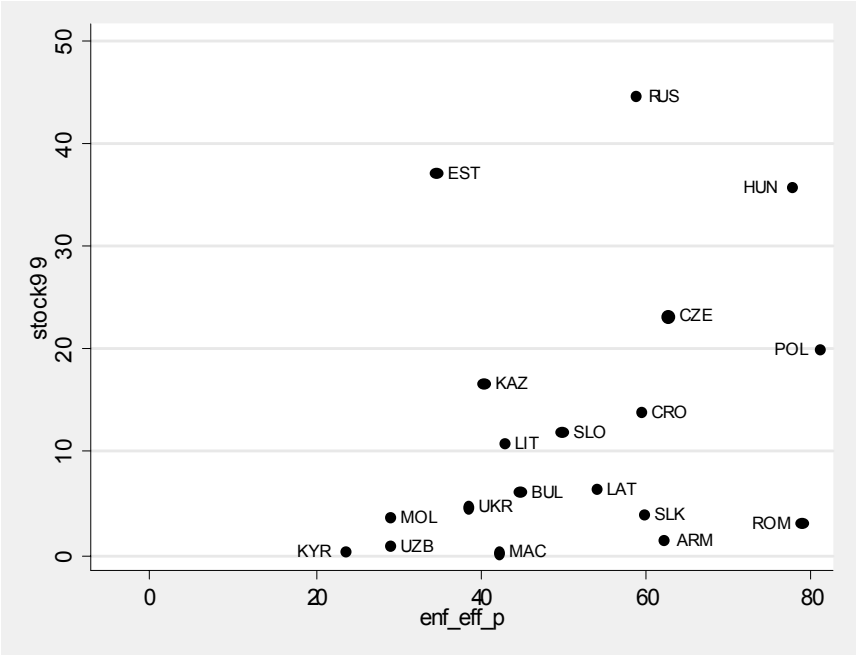
3.2.3 Enforcement Powers of Regulator

Much like Glaeser et al.(2001), we do not find many differences in the enforcement powers of the securities regulator in Poland and the Czech Republic. Glaeser et al. establish that in both countries the Regulator was entitled to issue and revoke licenses, to generate regulations and to impose fines for violations of securities laws and regulations, but had to refer criminal cases to the public prosecutor. Similarly, when asked whether the Regulator has enforcement powers, all respondents in Poland and the Czech Republic agree that this is the case. However, when asked about what these powers include, all Polish respondents indicate both ability to revoke an issuer's listing and ability to impose civil fines or penalties (scores of 0.15 and 0.35 respectively), while only half of Czech respondents think that the Czech regulator has the authority to revoke a license (mean score of 0.08), and about 77% think that the Czech regulator is authorized to impose civil fines and sanctions on violators. However, a more pronounced difference relates to the use of oversight and enforcement powers by the Regulator. Polish respondents tend to answer that their Regulator has always used his enforcement powers in the preceding five years (mean score of 100.00), Czech respondents agree that their Regulator has done the same, but to a lesser degree (mean score of 0.88).

On insider trading rules, all the interviewed Polish and Czech lawyers report that insider trading is prohibited. Czech respondents suggest on average that such a prohibition is supported by a wider array of laws and administrative rules than Polish respondents do (the mean score of the comprehensiveness of prohibition is 0.46 for the Czech Republic and 0.34 for Poland). For example, six of the seven interviewed Polish respondents agree that insider trading is prohibited through a legislative act; a further four of these agree that it is also prohibited by criminal law. Only one respondent indicates prohibition by legislative act, criminal law, administrative rules and regulations and stock exchange rules. Twelve out of the thirteen Czech respondents indicate prohibition by a legislative act; eight confirm that prohibition by criminal law exists; four say insider trading is also prohibited by stock exchange rules, and also four respondents say that insider trading is prohibited by private law. However when asked next about the frequency with which the Regulator engages in cases of insider trading, Polish regulators are reported to have been more actively pursuing insider dealing violations (mean score of 0.63 versus a mean score of 0.38 for the Czech Republic).

Overall, the Legal Indicator Survey results on the enforcement powers of the Regulator corroborate the conclusions reached by Glaeser et al. (2003). Indeed, we do find that the Polish Securities Commission was much more actively in-

Figure 2: Stock Market Capitalization and Effective Enforcement Powers of the Securities Regulator



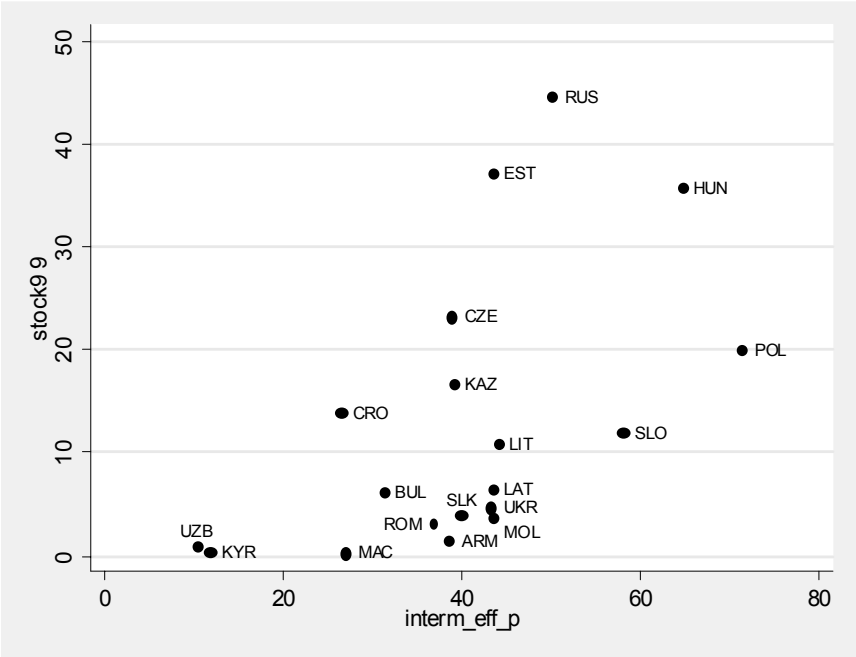
volved with the supervision of market participants and finding violations of the securities law.

3.2.4 Regulation of Securities Intermediaries

A cross-country comparison in the Regulation of Intermediaries sub-index, reveals that Poland and Hungary are the two countries with the most stringent regulation of securities market intermediaries, followed by Slovenia, Russia, the Slovak Republic and the Czech Republic. The lowest-ranking countries are Kyrgyzstan, Azerbaijan, Albania, Georgia and Uzbekistan.

How do the rankings for the Poland and the Czech Republic compare? Glaeser et al. (2001) argue that some of the key differences in the two countries' securities laws relate to their provisions regarding regulation of market intermediaries such as brokers, brokerage firms, investment advisors, investment funds, and custodian banks. The argument for regulation of intermediaries goes back to James Landis (1938) who argued that the United States Securities and Exchange Commission (SEC) could not monitor the compliance with disclosure, reporting and other rules by all publicly listed companies and the trading practices of all market participants. Instead, the SEC should regulate market intermediaries

Figure 3: Stock Market Capitalization and Effectiveness of Regulation of Securities Market Intermediaries



such as investment advisors, brokers, etc., placing on them the burden of ensuring compliance by market issuers and traders. It would be in their reputational interest to ensure good compliance by other market participants. With intermediaries being relatively few in number, the SEC could monitor and regulate them more easily.

In line with their earlier findings, Glaeser et al. (2001) report that in Poland individual brokers and brokerage firms faced considerably stiffer licensing requirements and regulations than their Czech counterparts. More specifically, the Polish law instituted elaborate licensing requirements for individual brokers accompanied by tests. The Czech exams and requirements appeared much easier and pro-forma. Czech law, for instance, did not require brokers to engage in "honest trading" and act in the interest of clients, whereas the Polish law did. Polish law imposed considerable requirements on brokerage companies such as an obligation to report who has more than 5 percent of voting rights; to report changes in voting rights above 2 percent; and to allow the securities regulator access and inspection rights. Czech law required none of these. Polish law also established strict requirements for the conduct of investment advisors such as subjecting them to mandatory licensing by the Regulator, requiring them to pass an exam administered by the Regulator, and subjecting them to

inspections by the Regulator as well as to disclosure of ownership information. Czech law contained no specific provisions on the regulation of investment advisors. Again, Polish securities law was more restrictive in terms of regulation of investment (mutual) funds and custodian banks.

We can test some of these findings since the Legal Indicator Survey contains a reasonably extensive subset of questions pertaining to regulation of intermediaries. Indeed, we find that in aggregate terms, Poland does considerably better in its Regulation of Intermediaries sub-index than the Czech Republic (mean score of 82.10 for Poland against a mean score of 62.42 for the Czech Republic). Looking for the sources of this difference, we find that first, both countries report that the securities law regulates the conduct of market intermediaries such as brokers and dealers, that brokers and dealers are subject to mandatory licensing and that they must have certain professional qualification. Clearly, the question was interpreted by respondents as referring to individual brokers. However, when asked about the intensity of regulation as measured by the frequency with which brokers have has their licenses revoked in case of violations of the law, Polish respondents indicate a considerably higher frequency of intervention than the Czech respondents (0.63 versus 0.44). This again reinforces the earlier findings that the Polish Regulator is much more actively engaged in securities market regulation. A large difference arises in answers to the question whether self-regulatory organizations exist. Poland scores better than the Czech Republic (0.64 versus 0.36). There is no sizeable difference in the existence of collective investment schemes (funded pension funds or investment funds in the two countries) based on the survey answers. In line with the information in Glaeser et al.(2001) that investment (mutual) funds must be licensed by the securities regulator, all Polish and Czech respondents indicate that there are separate rules and regulations for the licensing and regulation of investment funds. A source of difference, however, is whether issuers of investment funds are subject to disclosure requirements and how effective such disclosure is. The paper by Glaeser et al. does not provide information on this aspect, but the finding that Polish law establishes stricter disclosure on investment funds (mean score of 1.00 compared to 0.83 for the Czech Republic), and that Polish investment funds are expected to provide such information more regularly than their Czech counterparts (mean score of 0.79 versus 0.60) is consistent with the general finding about Polish law requiring stricter disclosure from market participants.

Another source of difference arises from whether, or not, an investor compensation scheme exists to compensate investors for their losses in case of the failure of a market intermediary. While almost all Polish survey respondents agree that such a system is in operation, Czech respondents point to its absence (a mean score of 1.00 for Poland against 0.08 for the Czech Republic). Obviously, this is one of the largest differences in individual question scores. Czech respondents indicate a higher incidence of failures of securities market intermediaries, but report that investors are somewhat less likely to receive compensation for their losses (a mean score on frequency of compensation of 0.21 for the Czech Republic against 0.38 for Poland). Finally, there does not appear to be any difference in the existence of laws and regulations about the provision of professional cus-

Table 1: Stock Market Integrity Index and Sub-indices of Securities Regulation, LIS 1999: Correlation Coefficients

	SMINT98	SMINT96	SMINT94	SMINT92
DISCL	0.3576*	0.3739*	0.4249*	0.1684
DISCL_EXT	0.2862	0.2413	0.2300	-0.0451
DISCL_EFF	0.3081	0.3940*	0.5025*	0.3682*
INTERM	0.3790*	0.3792*	0.8373*	0.5650*
INTERM_EXT	0.2825	0.3283	0.6496*	0.3884*
INTERM_EFF	0.3631*	0.3336	0.7856*	0.5627*
ENF	0.1693	0.1928	0.4316*	0.3750*
ENF_EXT	0.0791	0.0790	0.2725	0.2569
ENF_EFF	0.3294	0.3628*	0.5623*	0.4579*
REGATTR	0.2519	0.0472	-0.0331	0.4324*
REGATTR_EXT	0.2198	0.0139	-0.0739	0.3599*
REGATTR_EFF	0.1562	0.0723	0.0507	0.2960
CAP99	0.3896*	0.3793*	0.7265*	0.5380*
EXTCAP99	0.3514	0.3215	0.5719*	0.3913*
EFFCAP99	0.3724*	0.3768*	0.7519*	0.5789*

Source: Pistor et al. (2000), and author's compilations. Note: Asterisks indicate that the coefficient is statistically significant at the 10% level.

todial services such as a shareholder depository (mean scores of 0.50 for both), but such a system seems to be operating somewhat more effectively in Poland than in the Czech Republic (mean score of 0.50 against a mean score of 0.45).

In conclusion, the Glaeser et al. (2001) results about Polish law regulating securities market intermediaries much more comprehensively and stringently than the Czech law is supported by our breakdown of the relevant questions on Regulation of Intermediaries. The main differences are due to a higher intensity of regulation of brokers and dealers; presence of self-regulatory organizations with oversight responsibilities over market participants; more extensive and effective disclosure requirements for investment funds; and the existence of an investor compensation scheme.

Having conducted an extensive comparison of our disaggregated index ranking with the findings of Glaeser et al. (2001) for Poland and the Czech Republic, we next compare our securities law extensiveness and effectiveness indices to the Pistor et al.(2000) index of stock market integrity (SMINTEGR). Table 1 shows the correlation coefficients between the values of the SMINTEGR index for 1998, 1996, 1994 and 1992 (as coded by the authors), and our LIS-based indices of securities law extensiveness and effectiveness. From the outset, we would expect some positive correlation with some of our four main sub-indices, i.e. disclosure, regulation of intermediaries, enforcement powers and regulator's attributes. We would expect correlation to be fairly limited since the scope of information coded in SMINTEGR differs considerably from the content of the securities law questions in the LIS. For example, SMINTEGR is coded on a 0 to 6 scale, with six

components. Three of these relate to securities regulation directly. One point is given to the presence of a state agency for capital market supervision, and another point is scored for independent capital market supervision. These two elements can be compared with the information gathered by LIS on Regulator's Attributes (Q2). Another point is added to the SMINTEGR index if insider trading is prohibited by law. This part is then comparable to our sub-index of Enforcement Powers of the Regulator (namely, Q13 and Q14). Therefore, we would expect some correlation. However, the SMINTEGR index also contains provisions, which are not related to securities laws per se, such as mandatory takeover bids; shareholder register being conducted by an independent firm; rules against self-dealing; mandatory disclosure triggers for acquisitions of large blocks of shares. Therefore, the Pistor measure contains some provisions form general company law, which are supportive of the functioning of the stock market. In contrast, our securities measures do not cover all these aspects, but go into much further detail about disclosure, intermediary regulation, attributes and powers of the Regulator. They allow us to conduct the detailed comparisons with other studies as above. In contrast, Pistor et al (2000) note that their coding of stock market integrity (SMINTEGR) does not allow them to pick up very clearly the differences in Czech and Polish securities laws as debated by Glaeser et al. (2001). Altogether, we find some positive correlation between SMINTEGR scores for 1998 and earlier years, and our sub-indices for 1999. Surprisingly, we find more instances of significant positive correlation for SMINTEGR values in earlier years (1992 and 1994). In addition, effectiveness sub-indices show stronger positive correlation than extensiveness ones.

4 Methodology

We are interested in examining the relationship between stock market development and regulation of securities markets as captured by the answers of legal experts to the LIS. We have outlined above the main sub-indices, based on the survey, and why they are important for securities markets. We are particularly interested in testing which types of securities regulations, if any, affect market development.

Our testing procedure relies on a standard regression methodology despite the serious limitations of the sample size (19 observations), which restricts the degrees of freedom with which we operate and make inferences. Nevertheless, we prefer the econometric approach for a number of reasons. First, simple "eye-balling" of the association between capital market development and securities regulation reveals that some of the regulatory sub-indices exhibit a positive relationship with market capitalization. For example, both the effectiveness sub-index of disclosure requirements (DISCL_EFF) and the effectiveness component of the sub-index of regulation of capital market intermediaries (INTERM_EFF) appear to have a positive relationship with market capitalization as a share of GDP (STOCK99) (figures 1 and 3 above). However, examining these scatterplots is not sufficient to tell us whether this relationship is robust to

other factors, or what the causality and degree of association are. Moreover, we would like to be able to compare our results with earlier findings in the related literature, e.g. Pistor et al. (2000), and in order to do so with a reasonable degree of confidence, an approach similar to the one used in earlier studies, i.e. econometric techniques, must be followed.

Notwithstanding this decision, we also discuss and present our data in graphic form in order to identify potential outliers and visually illustrate the association between the variables of interest.

Below we address the choice of dependent and explanatory variables to be used, and some of the problems which we encounter when conducting the regression method chosen.

4.1 Choice of Variables and Regression Specification

We are interested in examining the effect of the extent and effective use of securities laws and regulations on stock market development. We use two main proxies for the level of stock market development. One is the ratio of stock market capitalization to GDP in 1999. The second variable is stock market turnover, i.e. the ratio of the value of stocks traded and market capitalization. Capitalization and turnover measure different aspects of stock market development. Market capitalization is the product of number of listed stocks and the price of the stocks. It is scaled by GDP to control for economy size. Therefore, high capitalization may reflect either a high number of listed companies, or a high valuation of listed companies, or both. Capitalization is thus a measure of the size of the stock market. More importantly, recent theoretical models, e.g. Shleifer and Wolfenzon (2002), establish that better investor protection is associated with both a higher number of listed domestic firms, and with higher valuations of listed shares. Since capitalization reflects both, it is a suitable proxy for stock market development.

Market turnover is a measure of stock market liquidity. It is equal to the value of stocks traded divided by stock market capitalization. Thus, it gauges the extent to which stocks are traded relative to the size of the stock market. For example, a market with high capitalization is not necessarily a liquid one. Stocks may be dormant or not actively traded, which would lead to low turnover despite high capitalization. We also have at our disposal measures of the value of stocks traded as percent of GDP. This measures stock market liquidity relative to the size of the economy. The two measures of market liquidity are different: turnover will be high in a small and liquid stock market, but value traded will be low.

There are other variables which proxy stock market development and which are used in the related literature. These include the value of initial public offerings (IPOs) relative to the country's GDP; the number of domestic publicly-traded firms scaled by population; subjective assessments about the ease of raising equity finance on a given stock market measured by cross-country surveys of investors, etc. We have at our disposal limited information about the number of listed firms and value of IPO activity in our sample countries. The data have

missing observations for a number of countries, which reduces the sample size considerably. Nevertheless, we attempt to show the impact of securities laws on these alternative measures of stock market development in the robustness checks.

In order to isolate the effect of legal development on financial development, we control for a number of variables identified as significant predictors of financial development in previous research. For example, some observers argue that market capitalization might not be a good indicator of stock market development in transition countries as it depends to a large extent on the depth of the privatization effort, and higher capitalization might simply reflect more privatized companies rather than companies going public to raise external finance. One way to deal with this is to employ alternative measures of stock market development as a dependent variable, such as market turnover, number of listed firms or value of IPOs. A second way to deal with this, which has also been done in previous work on the subject, e.g. Djankov et al (2000) and Pistor et al. (2000) is to introduce among the regressors a control variable for mandatory privatization-related listings on the stock market. As mentioned earlier, several transition countries which had mass voucher privatization programs, such as the Czech and Slovak Republics, Lithuania and Romania, forced privatized firms to list on the stock exchange, and the transfer of ownership passed through the stock exchange. This is in contrast to other countries where there was no mass privatization and stock markets were established with relatively few IPOs, and to a third group of countries which fall somewhere in between – i.e. where there was mass privatization, but initial exchanges of shares took place off the stock exchange, and there were no mandatory listings for all privatized firms as in the first group of countries. To control for forced listings due to privatization, we include a dummy variable for all countries where mass voucher privatization was the primary method of privatization.

A second control variable is the level of economic development as measured by the logarithm of GDP per capita. The law and finance literature recognizes the need for isolating the effect of general economic development from the effect of legal factors on financial outcomes. Economic development is associated generally with more developed and deeper capital markets. Moreover, richer countries may have generally better laws and institutions for law enforcement. Therefore, some scholars argue that legal development may only affect financial development through its carrying a "general development effect", i.e. legal development may only affect financial development insofar as it picks up this general economic development effect. Therefore, we need to isolate the effect of the laws beyond the effect of economic development. We address how this will be done in the following sub-sections.

Macroeconomic stability is also an important factor for financial market development. High inflation reduces expected returns and the willingness of investors to buy shares. Theoretical literature shows that inflation interferes with the ability of financial markets to allocate resources efficiently. Recent empirical research, e.g. Boyd, Levine and Smith (2001), suggests that there is a significant negative relationship between stock market activity and inflation. In

addition, the authors find evidence of thresholds – economies with inflation rates exceeding 15% per annum exhibit a discrete drop in financial sector performance. In recognition of these findings and since many transition countries have or did have high inflation, we include a measure of average inflation over the preceding 5 years and including 1999 in our regressions. The years are chosen so as to reflect the timing of stock market development (which started in many places in the mid-1990s, and to also smooth out inflation fluctuations over the period.

Financial development is also shown to be affected by general institutional development such as legal origin, or the prevailing systen of law and order in a country. Since the transition economies all underwent an extended period of time under communism, time spent under communism may serve as a good proxy for historical memory of markets. The idea that historical memory of markets and institutions matters, has been put forward in a number of empirical studies of transition economies. Shared historical past with Western European countries and experience with laws and market institutions like banks and stock markets prior to the onset of communism in some of these countries might be reflected in the present degree of banking and stock market development and regulation. In other words, we may expect that historical memory would play a role in the effective application of financial laws and functioning of capital markets. The number of years under communism could serve as a useful proxy for the memory of market institutions. In this respect the transition economies could be divided into three main groups: those, which spent a low number of years under communism (40-45 years), those with a high number of years under communism (70-75), and the medium-range countries (51-52 years). Among the first group are most of the Central and Eastern European countries; the three Baltic countries and Moldova fall into the intermediate range, and all the other former Soviet republics are at the high end of the scale. We have conducted a simple analysis of differences in means of securities law effectiveness for these three groups of countries, shown in Table 2. The results indicate statistically significant differences in mean effectiveness of securities laws (for all 5 indices) between the countries with high and low number of years under communism, and for three of the five indices when comparing the group of countries with high and medium number of years under communism.

As witnessed by the literature on law and finance, the causal effect of legal development on financial development cannot be established with certainty. Therefore, we also employ several instrumental variables to control for potential endogeneity between law and stock market development. We address this issue in the next section in more detail. We have chosen to use countries' legal transplant status, as defined by Berkowitz et al. (2003) and Pistor et al. (2000), as an instrument for our legal indices. We also consider alternative instrument sets in the sensitivity analyses and robusteness checks. For instance, we employ lagged values of the stock market integrity index by Pistor et al. (2000) as an instrument set for our securities law indices Another candidate for instrumenting legal enforcement, are years under communism. A third candidate to instrument for legal effectiveness is the main religion practised by the largest

Table 2: Years under Communism and Securities Law Effectiveness: Average Scores for Each Country Group

Years under communism	DISCL_EFF (mean)	INTERM_EFF (mean)	REGATTR_EFF (mean)	ENF_EFF (mean)	EFFCAP99 (mean)
70-75	64.89	26.75	71.20	36.44	41.67
50-55	74.55	43.71	81.85	40.31	53.23
40-45	73.95	40.46	89.72	58.07	55.03
T-test 70-75 / 50-55	-1.66*	-3.20***	-0.75	-0.39	-2.67**
	(0.0696)	(0.0063)	(0.2356)	(0.3506)	(0.0115)
T-test 70-75 / 40-45	-1.96**	-1.71*	-1.45*	-2.14**	-2.18**
	(0.0340)	(0.0527)	(0.0904)	(0.0237)	(0.0220)
T-test 50-55 / 40-45	0.11	0.54	-0.98	-2.22**	-0.36
	(0.4563)	(0.3014)	(0.1874)	(0.0258)	(0.3615)

Note: The table reports average scores for each category as well as the probabilities of rejecting the null hypothesis of equal means. One-tailed t-tests are reported. P-values are shown in parentheses next to t-statistics.

fraction of each country's population[7].

In summary, our basic regression specification is as follows:

$$STOCKDEV99_i = a + b * LEGEXT99_i + c * LEGEFF99_i + d * Controls + u$$

$STOCKDEV99$ is the measure of stock market development, a is a constant term, $LEGEXT99$ and $LEGEFF99$ are the respective extensiveness and effectiveness components of securities laws, and the set of control variables include GDP per capita, average inflation, and a voucher privatization dummy.[8]

Finally, we must stress that the pure cross-sectional regression model, which we are going to estimate has some distinct shortcomings. These are the inability of cross-sectional regressions to take into account time dimensions of data; potential omitted variable bias due to country-specific effects, which cannot be captured by the model; and potential simultaneity bias. In addition, cross-sectional regression models face common problems such as multi-collinearity. We address these drawbacks in the next sub-sections, and explain possible ways to overcome each.

[7] For example, Stulz and Williamson (2003) find that cultural proxes, such as religion and language, help explain both creditor rights across a sample of 49 countries, as well as legal enforcement of shareholder and creditor rights.

[8] An earlier version of this paper included the GDP growth rate among the explanatory variables. Since many studies on the finance-growth links have established that financial development predicts economic growth, i.e. causality runs from finance to growth, it is questionable whether growth belongs in the type of model we are estimating. We have conducted robustness checks, controlling for average GDP growth from 1995 through 1998, and find that our results do not change.

4.2 Endogeneity Problems

Endogeneity problems are quite common in a multiple regression model of the type we specify here, i.e. looking at contemporaneous measures of financial development and legal development. The presence of an endogenous explanatory variable in a multiple regression model could be due to an omitted variable, to measurement error or to simultaneity. Each of these causes the endogenous variable to be correlated with the error term of the regression, which violates the standard assumption of the OLS estimator of a zero conditional mean, and produces biased and inconsistent OLS estimates. In such cases, measures need to be taken to ensure that the parameter estimates are unbiased and consistent. One way to correct for endogenous dependent variables in cross-sectional multiple regression models is to employ instrumental variables (IV) estimation. The IV estimator relies on identifying a new variable, z, such that it is correlated with the endogenous dependent variable, but is not correlated with the regression error term u, i.e. is exogenous to the regression specification.

Since we are using contemporaneous legal indices of securities regulation and securities market development (both are for 1999), we face a problem of endogeneity in the estimation of our specification. We conjecture that, controlling for a set of other factors, legal development influences financial development. However, the opposite may also hold: i.e. financial market development itself may spur changes in laws and regulations[9]. Therefore, we meet a problem of simultaneity, whereby both the dependent variable and an explanatory variable may be jointly determined by some equilibrium process. In other words, we may suspect that STOCK99 and each of the securities market legal indices are endogenous. This would lead to OLS-estimated coefficients on the legal indices to be biased. In addition, we may also be omitting an important variable from our specification. This would also lead to bias in the OLS estimates. To confront these problems, we have chosen to employ instrumental variable techniques in addition to, and as a robustness check to our OLS results in a cross-country regression framework. As we mentioned above, there are two conditions which must be met for a variable to be a suitable instrument for securities regulation extensiveness and effectiveness in our stock market development regressions. First, we need to find a variable exogenous to securities development over the sample period. Second, it has to be correlated with our legal and regulatory measures.

One possible candidate for an instrument for our legal (regulatory) scores would be lagged values of the same. However, we do not have at our disposal the securities law variables before 1998. We only have measures of commercial law (i.e. company, bankruptcy, pledge and general effectiveness) effectiveness and extensiveness for 1997, when the commercial law part of the LIS was conducted for the first time. However, we do have measures of stock market regulation (SMINTEGR) for earlier years, as coded by Pistor et al. (2000). This index is available for 1992, 1994, 1996 and 1998, and we have already tested that it is

[9] Pistor et al. (2000) also make this point, and employ instrumental variables techniques to circumvent endogeneity problems.

reasonably correlated with our legal measures of securities regulation extensiveness and effectiveness, particularly for the early years (see Table 1). Since the laws governing stock markets in 1992, for example, could not have been affected by stock market developments in 1999, we assume that the lagged indices are exogenous to our regression model.

Another suitable instrument for our legal scores would be the so-called legal transplant status, i.e. how a country adopted its system of fundamental laws. Berkowitz, Pistor and Richard (2003) analyze transplantation of legal codes from "origin" countries to "transplant" countries. Jurisdictions of 49 countries are categorized as either being origins, i.e. where legal codes and orders developed internally, or transplants, i.e. where laws and codes were copied from foreign countries, usually through colonization and conquest, but sometimes through a process of voluntary transplantation. Depending on whether or not transplant countries adapted the transplanted laws to local conditions and/or had a population already familiar with the basic principles of the transplanted laws, they are divided into receptive and unreceptive transplants. It is established that transplant status is a significant determinant of current legal effectiveness or legality, with origins and receptive transplants enjoying the highest levels of legal effectiveness. Pistor et al. (2000) apply this analysis to the transition economies, and divide them into three categories: receptive transplants, unreceptive transplants and new transplants[10]. There are no origin countries among them. Table 3 displays the mean effectiveness scores for our securities indices for the three types of transplants. T-tests of differences in mean scores are performed, and show that receptive transplants enjoy significantly higher effectiveness than new transplants across all legal indices of securities regulation. Receptive transplants also score significantly higher than unreceptive transplants on three of the five legal effectiveness indices; finally, there are no significant differences in mean effectiveness scores between the new and unreceptive transplant countries.

Since importation of laws can be assumed to be exogenous to the economic variables which we are testing, but is also correlated with current legality (legal effectiveness), it can serve as an instrumental variable for our effectiveness, and perhaps other legal scores. Thus, transplant status is also included as an instrument for the indices of securities regulation. Employing transplant status in this manner is equivalent to the use of legal origin in the related cross-country literature on law and finance, and on finance and growth (on the assumption that legal origin, categorized as English common law, French civil law, German civil law or Scandinavian civil law, was adopted much earlier than the industrial revolution, and could not have been influenced by financial or economic development). Since the countries we are studying are all classified as having a Socialist legal origin, legal origin cannot be used as an instrument,

[10] The group of Receptive transplants includes Bulgaria, Croatia, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania and Slovenia. Albania, Bosnia and Herzegovina, FYR Macedonia and the Slovak Republic are categorized as Unreceptive transplants. Finally, the group of the New transplants includes Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan, Kyrgyzstan, Moldova, Russia, Ukraine and Uzbekistan.

Table 3: Legal Transplant Status and Securities Law Effectiveness: Average Scores for Each Country Group

Country transplant status	DISCLOSE_EFF (mean)	INTERM_EFF (mean)	REG_ATTR_EFF (mean)	ENF_EFF (mean)	EFFCAP99 (mean)
New transplant	65.00	28.43	71.58	39.36	42.35
Unreceptive transplant	67.21	25.60	85.19	31.28	42.58
Receptive transplant	77.01	45.91	89.41	58.77	50.53
T-test New/Unreceptive	-0.34 (0.3756)	0.28 (0.3971)	-0.92 (0.1923)	0.5477 (0.3037)	-0.03 (0.4903)
T-test New/Receptive	-3.01*** (0.0042)	-2.57*** (0.0096)	-1.54* (0.0761)	-2.19** (0.0218)	-3.33*** (0.0019)
T-test Unreceptive/Receptive	-1.64 (0.1047)	-2.06* (0.0626)	-0.41 (0.3585)	-1.98* (0.0592)	-1.86* (0.0847)

Note: The table reports average scores for each category as well as the probabilities of rejecting the null hypothesis of equal means. One-tailed t-tests are reported. P-values are shown in parentheses next to t-statistics.

and the countries' legal transplant status is a good substitute for it.[11].

Therefore, we choose to estimate our basic regression model above with OLS, and then with two-stage least squares using the TRANSPLANT_STATUS instrument set just described. We implement two diagnostic tests for the IV regressions. First, we test whether endogeneity is indeed present. We perform the Hausman test, which compares the coefficient estimates of the OLS and IV regrssions and indicates whether OLS is inconsistent, assuming that the IV estimator is consistent. If we can reject the null hypothesis of no systematic difference between the OLS and IV estimates, this means that OLS is inconsistent and endogeneity is present. Another way to test for endogeneity is done by regressing the endogenous variable on all exogenous variables included in the structural model (including the instruments), and using the estimated residual in an OLS regression of the structural equation (including the endogenous and exogenous variables). If the residual is found statistically significant, we can conclude that endogeneity is present. This procedure is given by Davidson and MacKinnon (1993).

[11] To the extent that some transition countries adopted different West European legal codes, such as civil, commercial and criminal codifications, at the end of the 19th and the beginning of the 20th centuries, a classification is sometimes attempted to link them to the origin country from which major codes were copied. For example, Central European countries such as the Czech Republic and Hungary are often classified as German legal origin countries. Others, such as Poland, borrowed more extensively from French and Italian legal codes, and this can be classified as French origin ones. In addition, some countries developed their pre-war basic laws by mixing from different Western scources, such as borrowing from German sources for their pre-war commercial codes, but from French sources for their civil codes (e.g. Bulgaria). Since at present there is no universally accepted view linking these countries to any of the four major legal families, we will not employ legal origin in our analysis.

Since we employ more instruments that the number of endogenous variables, our model is over-identified. Therefore, we can test whether the instruments are uncorrelated with the error term, i.e. test for the validity of the instrument set. This is done through a test of the over-identifying restrictions. The test is summarized as follows: the structural model is estimated via 2SLS, and the residuals are then regressed via OLS on all exogenous variables (including the instruments). The R^2 from this regression is then multiplied by the number of observations, n, and this equals the test statistic. Under the null hypothesis that the instruments are uncorrelated with the error term, it is distributed as a Chi-square with degrees of freedom equal to the number of instruments minus the number of endogenous variables. Therefore, if we cannot reject the null hypothesis, the instruments pass the over-identification tests. We show the value of the Sargan test statistics, which we have just described.

4.3 Multi-collinearity

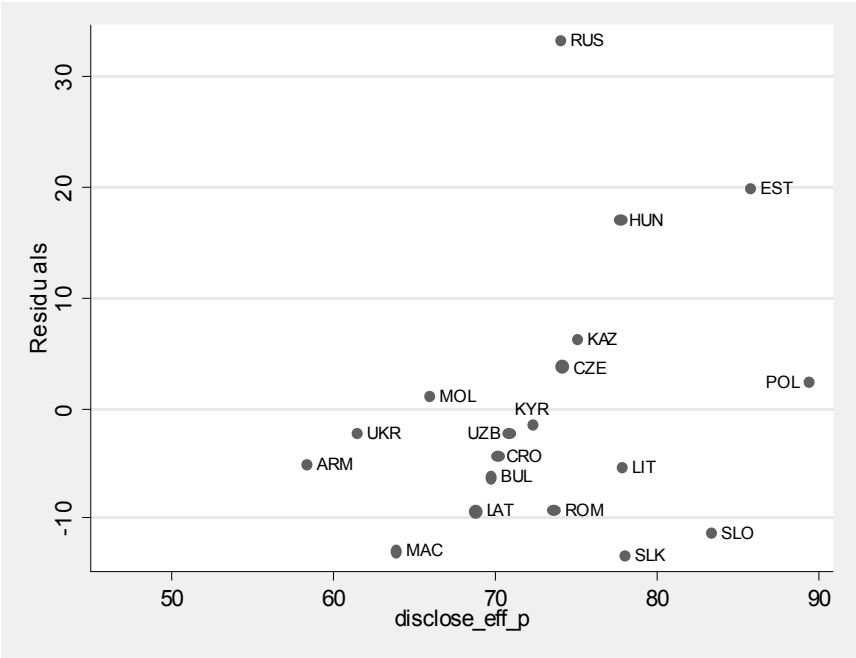
Some of our explanatory variables in the main regression specification are highly correlated. Their simultaneous inclusion in the regression specification would then result in multi-collinearity, which leads to bias in the estimated standard errors and coefficients. Which are the variables which are collinear?

First, as explained above, we would like to control for the level of economic development in the regressions as measured by GDP per capita. There is a debate in the law and finance literature whether or not to include GDP per capita among the regressors. There are studies, e.g. La Porta et al. (1997) and (2003), which control for economic development. Most studies, however, choose to omit GDP per capita from regressions of financial development on legal development on the grounds that the level of a country's economic development is usually highly correlated with the legal development variables, and this induces multi-collinearity in a standard multiple regression estimation. It is a legitimate question whether such an omission is desirable, since one might argue that legal development might just reflect "a level of economic development" effect rather quality of laws or their enforcement per se. In other words, an estimated positive association between legal variables and financial market development variables might just be because the legal variables are picking up an "a level of economic development" rather than actual legal development. If this were the case, then the regression estimates would suffer from omitted variable bias. On the other hand, including both legal variables and GDP per capita in the same regression leads to multi-collinearity. How can we get around these problems?

One way to do so is to regress financial development on GDP per capita, and to use the estimated residuals as the dependent variable in a new regression, which tests for the effect of the legal variables and the control variables. In this manner, we can investigate whether the legal variables offer any explanatory power over and above that provided by general economic development. We conduct this procedure for all our securities regulation legal scores.

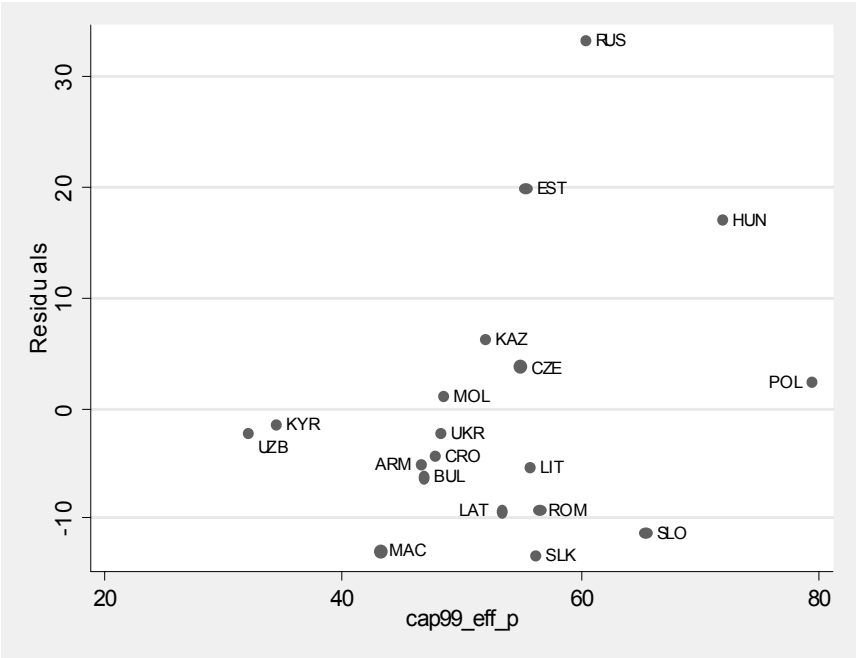
Second, we are interested in distinguishing between legal extensiveness and legal effectiveness scores for our four main variables of securities regulation. Ide-

Figure 4: Residuals of a Regression of Stock Market Capitalization on (log) GDP per capita and a Constant, and Disclosure Requirements Effectiveness Sub-index



ally, we would include both the extensiveness and effectiveness measures in a regression specification. However, since extensiveness and effectiveness are generally positively and significantly correlated, this also induces problems of multicollinearity. Table 4 shows the pairwise correlation coefficients between the extensiveness and effectiveness components of the 4 main securities regulation variables as well as the aggregate ones. We see that three of the four sub-index extensiveness-effectiveness pairs are positively correlated and the coefficients are significant at the 10% level at a minimum. Only the regulator attributes extensiveness and effectiveness components are not correlated (REG_ATTR_EXT and REG_ATTR_EFF). At the aggregate level, we also establish high positive and significant correlation – *EXTCAP99* and *EFFCAP99* have a correlation coefficient of 0.74, which is statistically significant at the 1% level. Since we would like to test for the separate impact of both extensiveness and effectiveness legal measures, we adopt the procedure outlined above – i.e. we test for the impact of legal extensiveness on financial market development first. Then we employ the residuals from the latter regression as the dependent variable in a regression on legal effectiveness and other control variables. In this fashion, we isolate the effect of extensiveness, and test whether effectiveness has any

Figure 5: Residuals of a Regression of Stock Market Capitalization on (log) GDP per capita and a Constant, and Aggregate Capital Market Effectiveness Sub-index



explanatory power beyond that of extensiveness.

A further robustness check about the impact of legal development on financial development is through using our composite indices, which imply that there is no distinction between extensiveness and effectiveness. This can provide an indication whether, assuming there are no conceptual differences among the LIS questions, legal developments matter at all, and which aspects of securities laws matter most. Again, we would like to test this by including them in the same regression equation. However, multi-collinearity arises due to positive and generally significant correlation among the aggregate sub-indices of capital market regulation (see Table ?). To identify, which of these sub-indices matter the most, we also conduct the procedure outlined above.

5 Regression Results

5.1 Disclosure Rules

In this section we describe the main regression results for the impact of legal extent and legal effectiveness of disclosure rules on stock market development,

Table 4: Correlation Between Extenisveness and Effectiveness Scores of Securities Laws

	DISCLOSE_EFF	INTERM_EFF	REG_ATTR_EFF	ENF_EFF	EFFCAP99
DISCLOSE_EXT	0.3635*				
INTERM_EXT		0.5064**			
REG_ATTR_EXT			0.1581		
ENF_EXT				0.6609***	
EXTCAP99					0.7356***

Note: The table reports pairwise correlation coefficients. *** Significant at 1%; ** significant at 5%, * significant at 10%.

controlling for other potential determinants of stock market development. The dependent variable in these regressions if stock market capitalization in 1999. In the next section we will present robustness checks, using both stock market development in 2000 (*STOCK00*) and stock market turnover in both 1999 and 2000 (*TURNOVER99* and *TURNOVER00*).

First, we present the results on the impact of securities disclosure rules, as captured by lawyers' perceptions. The results in Table 5 indicate a strong, positive relation between each of the three disclosure indices and market capitalization in 1999. Having voucher privatization as the main method of transfer of state ownership into private hands also has the expected positive sign, but is generally insignificant (it is also collinear with DISCL_EXT and DISCL, and we omit it from the specification testing for the impact of aggregate disclosure requirements). These regressions, however, do not control for any other factors which may explain financial development. As discussed above, GDP per capita is correlated with our legal variables, and to isolate its impact on stock market development, we use an OLS regression of STOCK99 on the log of GDP per capita in 1999 and a constant. The estimated residuals of this regression are further regressed on average inflation (AVINFL) since it is significantly negatively correlated with GDP per capita (and is also generally highly correlated with the legal variables). Thus we obtain the residuals for this second estimations, and have therefore measures of stock market capitalization, controlling for income per capita and inflation. Regressions (4) and (5) in Table 5 show the results of regressing these residuals on both the extent and effective use of disclosure rules (DISCL_EXT and DISCL_EFF). In a joint specification both coefficients are statistically insignificant, most likely due to collinearity. However, the effectiveness measure has a stronger impact than the extensiveness one, and is only marginally insignificant in this joint specification. When we omit DISCL_EXT from the specification (equation (5)) we find that the effectiveness of disclosure requirements (DISCL_EFF) regains significance, albeit at the 10% level only. This is a strong indication that the effective use and application of securities disclosure rules, as perceived by the surveyed lawyers, has explanatory power for stock market development beyond that of general economic development

Table 5: Disclosure Requirements and Stock Market Capitalisation, 1999. OLS Estimations

Independent variable	STOCK99	STOCK99	STOCK99	(4)	(5)
DISCL_EXT	0.7871***			0.1706	
	(0.2169)			(0.2524)	
DISCL_EFF		0.9829***		0.3917	0.5370*
		(0.2668)		(0.2593)	(0.2938)
DISCL			0.9209***		
			(0.2757)		
VOUCHER	15.6956**	5.6028		11.1286	8.7204
	(7.0250)	(6.8621)		(7.4012)	(6.4600)
Intercept	-47.1***	-60.9***	-72.8**	-44.1*	-42.0*
	(14.4928)	(18.3999)	(29.32)	(23.0633)	(20.3004)
Number of observations	19	19	19	19	19
Adjusted R-squared	0.37	0.37	0.35	0.21	0.20

Note: *** significant at 1%. ** significant at 5%. * significant at 10%. Robust standard errors shown in parentheses next to coefficient estimates. Estimations (4) and (5)'s dependent variable is the residual of an OLS regression of (1) STOCK99 on the log of GDP per capita, inflation and a constant.

(proxied by the log of GDP per capita), and macroeconomic stability (proxied by inflation).

We then test for potential endogeneity of our legal variables by running instrumental variables (IV) regressions, using legal transplant status (TRANSPLANT STATUS) as an instrument for the three disclosure legal indices. As discussed earlier and shown in Table 3 the categorization of transition jurisdictions into new, unreceptive or receptive transplants is associated with current legal effectiveness. This is supported by the t-tests for differences in mean DISCL_EFF (and the other securities legal effectiveness measures) across the three groups. Conveniently, it is safe to assume that transplantation of major laws occurred much earlier than current stock market development, and is therefore exogenous to our structural estimation of STOCK99 on securities law variables. In the IV estimations, using the TRANSPLANT STATUS dummies as instruments for DISCL_EXT, DISCL_EFF, and DISCL separately, we find a significant positive association between market capitalization and the effectiveness of disclosure rules only. The extensiveness and aggregate disclosure indices are insignificant. Therefore, after correcting for endogeneity, only DISCL_EFF is found to be statistically significant (at the 10% level).

We must stress, however, that the Hausman test does not reveal endogeneity. In none of the specifications is the test statistic significant, which indicates that there is no endogeneity. Despite this evidence, we present both the IV and OLS

Table 6: Disclosure Requirements and Stock Market Capitalisation, 1999. Instrumental Variables (IV) Estimations Using 2SLS and TRANSPLANT STATUS as an instrument

Independent variable	STOCK99	STOCK99	STOCK99
DISCL_EXT	0.2328 (0.3963)		
DISCL_EFF		1.1121* (0.6141)	
DISCL			0.6069 (0.4445)
VOUCHER	6.3550 (6.3045)	6.0235 (6.1464)	8.5164 (4.9460)
Intercept	-5.5 (28.8549)	-70.4 (44.9616)	-33.3 (32.1965)
Number of observations	19	19	19
R-squared	0.19	0.32	0.35
F-test on first-stage equation	F(3, 15)=7.14 [0.0033]	F(3, 15)=2.03 [0.1534]	F(3, 15)=4.80 [0.0154]
Hausman test	2.30 [0.1295]	0.05 [0.8299]	0.97 [0.3243]
OIR test (Sargan test)	$\chi^2(1) = 3.012$ [0.0827]	$\chi^2(1) = 0.918$ [0.3381]	$\chi^2(1) = 2.800$ [0.0942]

Note: *** significant at 1%. ** significant at 5%. * significant at 10%. Robust standard errors shown in parentheses next to coefficient estimates. P-values shown is square brackets for the F-test and diagnostic tests.

results. The effectiveness regressions pass the Sargan test of over-identifying restrictions; the DISCL_EXT and DISCL regression pass the test at the 5% level, but not at the 10% level. Finally, we check whether the instruments are correlated with the endogenous variables. We report the F-test for joint significance of the instruments (plus the VOUCHER dummy) from the first-stage regression. The F-test results are significant for the disclosure extensiveness and aggregate regressions, but not significant for the effectiveness regression. Therefore, there is some doubt about the appropriateness of the instrument set for the DISCL_EFF estimation.

We interpret these results to mean that 1) the relationship between stock market capitalization and the perceived effectiveness of disclosure rules is robust to controlling for economic development, method of privatization and inflation, and 2) that the same relationship is also robust to correcting for potential endogeneity between effectiveness of disclosure rules and stock market performance. We also find evidence that the extent of disclosure rules as proxied by the perceived extent of disclosure rules in the securities laws is positively associated with market capitalization, but the relationship is not robust to the inclusion of controls for income per capita, inflation; or to correcting for endogeneity.

5.2 Intermediaries Regulations

We next run the above estimations, using the subset of indices on regulation of capital market intermediaries. First, separate OLS estimations of the im-

Table 7: Regulation of Intermediaries and Stock Market Capitalisation, 1999. OLS Estimations

Independent variable	STOCK99	STOCK99	STOCK99	(4)	(5)
INTERM_EXT	0.3576*			-0.1162	
	(0.1780)			(0.1922)	
INTERM_EFF		0.4926***		0.3133*	0.2670*
		(0.1374)		(0.1773)	(0.1494)
INTERM			0.5874***		
			(0.1871)		
VOUCHER	2.2547	3.4817	3.0005	7.7065	7.5566
	(7.0978)	(6.6261)	(6.3704)	(6.5535)	(6.2192)
Intercept	-16.3	-8.1 (5.5240)	-22.1**	-5.8	-13.1**
	(12.8211)		(10.4068)	(13.0722)	(5.9720)
Number of observations	19	19	19	19	19
Adjusted R-squared	0.10	0.31	0.27	0.20	0.19

Note: *** significant at 1%. ** significant at 5%. * significant at 10%. Robust standard errors shown in parentheses next to coefficient estimates. Estimations (4) and (5)'s dependent variable is the residual of an OLS regression of (1) STOCK99 on the log of GDP per capita, inflation and a constant.

pact of the extensiveness and effectiveness sub-indices (INTERM_EXT and INTERM_EFF) reveal a positive and statistically significant association with stock market capitalization in 1999. The aggregate index of market intermediary regulation (INTERM) is also statistically significant and has a positive sign. The voucher privatization dummy is not significant in any of the estimations.

As explained above, we estimate an OLS regression of STOCK99 on the logarithm of GDP per capita, and then use the residuals to also control for average inflation (both are omitted from the initial estimates due to multi-collinearity). The next step is to utilize the residuals from these two successive regressions as the dependent variable in an estimation on INTERM_EXT, INTERM_EFF and VOUCHER_PRIV. The two legal variables are correlated, and we find that extensiveness is no longer significant and has the wrong sign. This is most likely due to multi-collinearity. In separate estimations we establish that INTERM_EFF still retains significance, albeit at a lower level than in the basic OLS model without controls for GDP per capita or inflation. The VOUCHER dummy has the expected positive coefficient, but is insignificant. In the other specification, INTERM_EXT loses significance after we control for the effect of GDP per capita and past inflation. Therefore, these results indicate a role for effective regulation over stock market intermediaries in benefiting stock market development.

In the instrumental variables (IV) estimations, we proceed as follows. Our

Table 8: Regulation of Intermediaries and Stock Market Capitalisation, 1999. Instrumental Variables (IV) Estimations Using 2SLS and TRANSPLANT STATUS as an instrument

Independent variable	STOCK99	STOCK99	STOCK99
INTERM_EXT	0.2750 (0.7298)		
INTERM_EFF		0.7674* (0.4286)	
INTERM			0.8992 (0.6450)
VOUCHER	2.2892 (7.3711)	4.0832 (6.3338)	3.3172 (5.9362)
Intercept	-9.7 (57.1321)	-19.3 (16.7478)	-40.2 (37.6484)
Number of observations	19	19	19
R-squared	0.09	0.22	0.20
F-test on first-stage equation	F(3, 15)=0.54 [0.6634]	F(3, 15)=1.01 [0.4170]	F(3, 15)=0.81 [0.5082]
Hausman test	0.01 [0.9248]	0.44 [0.5082]	0.26 [0.6068]
OIR test (Sargan test)	$\chi^2(1) = 2.802$ [0.0941]	$\chi^2(1) = 0.413$ [0.5206]	$\chi^2(1) = 1.257$ [0.2622]

Note: *** significant at 1%. ** significant at 5%. * significant at 10%. Robust standard errors shown in parentheses next to coefficient estimates. P-values shown is square brackets for the F-test and diagnostic tests.

endogenous variables are the three legal indices. As discussed in Section 4 above, we have identified suitable instrument sets for these legal variables. We run two-stage least squares (2SLS) estimations, where the endogenous variables, INTERM_EXT, INTERM_EFF and INTERM, are regressed on the instrument set (plus the exogenous variable from the structural equation), and 2) use the predicted values from this first-stage OLS estimation to estimate our main equation (using the predicted values of the endogenous variable). Similarly to the results on disclosure requirements above, we find that INTERM_EFF is the only one of the three legal variables, which retains significance in the IV estimations, albeit at the 10% level only.

As indicated above, all three IV diagnostic tests do not show that endogeneity is present. The instruments generally pass the test of over-identifying restrictions, but are not found correlated with the endogenous variables (the first-stage F-tests are all insignificant).

5.3 Enforcement Powers of Regulator

We next check for the significance of enforcement powers of the Regulator, including legal prohibitions of insider trading and their enforcement. None of the indices of Enforcement Powers of the Regulator are significant in these regressions. The OLS estimations using STOCK99 and, the residuals from regressing STOCK99 on the logarithm of GDP per capita and average inflation, as dependent variables find the three indices – ENF_EXT, ENF_EFF and ENF

– insignificant. The explanatory power of these estimations is rather low. The effectiveness measure (ENF_EFF) still performs better than the extensiveness one (ENF_EXT), but is not significant. Controlling for economic development and inflation (estimations 4 and 5) also leaves the extent and effective use of the law with respect to regulatory powers insignificant.

Table 9: Enforcement Powers of Regulator and Stock Market Capitalisation, 1999. OLS Estimations

Independent variable	STOCK99	STOCK99	STOCK99	(4)	(5)
ENF_EXT	0.2955			-0.0163	
	(0.2222)			(0.2323)	
ENF_EFF		0.3133		0.1342	0.1283
		(0.2254)		(0.2162)	(0.1921)
ENF			0.4155		
			(0.2688)		
VOUCHER	2.4883	6.2717	4.5274	8.6252	8.5560
	(7.3520)	(7.7994)	(7.2281)	(8.1344)	(7.6744)
Intercept	-8.0 (15.0089)	-5.2 (13.5943)	-14.0	-8.5 (15.6567)	-9.3 (11.6396)
			(17.6348)		
Number of observations	19	19	19	19	19
Adjusted R-squared	0.07	0.15	0.14	0.11	0.11

Note: *** significant at 1%. ** significant at 5%. * significant at 10%. Robust standard errors shown in parentheses next to coefficient estimates. Estimations (4) and (5)'s dependent variable is the residual of an OLS regression of (1) STOCK99 on the log of GDP per capita, inflation and a constant.

We take these results to mean that the enforcement powers of the securities regulator (such as ability to revoke issuer's licenses and impose civil penalties, as well insider trading prohibitions, as well as their enforcement in practice) are not significantly associated with market capitalization. Looking at more disaggregated forms of these indices we find some evidence of a positive association between comprehensive legal prohibitions of insider dealing and market capitalization, and effective use of powers to revoke licenses and fine securities issuers and market capitalization[12].

The instrumental variables estimations confirm our OLS results. Using TRANSPLANT_STATUS dummies as instruments for our legal extensiveness and effectiveness indices of enforcement powers, indicates no significance for either of the three legal indices. They have positive signs, but do not enter the second-stage regressions significantly.

Again, the Hausman test does not indicate that endogeneity is present in

[12] We do not report these regressions for considerations of space. They are available upon request.

Table 10: Enforcement Powers of Regulator and Stock Market Capitalisation, 1999. Instrumental Variables (IV) Estimations Using 2SLS and TRANSPLANT STATUS as an instrument

Independent variable	STOCK99	STOCK99	STOCK99
ENF_EXT	0.3584 (0.4037)		
ENF_EFF		0.5803 (0.4084)	
ENF			0.4719 (0.3924)
VOUCHER	2.5063 (7.2822)	9.5690 (5.9281)	4.8158 (6.0247)
Intercept	-12.3 (27.2818)	-19.9 (21.5528)	-17.6 (24.3380)
Number of observations	19	19	19
R-squared	0.07	0.05	0.13
F-test on first-stage equation	F(3, 15)=2.80 [0.0761]	F(3, 15)=2.04 [0.1508]	F(3, 15)=2.98 [0.0647]
Hausman test	0.03 [0.8660]	0.47 [0.4945]	0.02 [0.8782]
OIR test (Sargan test)	$\chi^2(1) = 2.139$ [0.1436]	$\chi^2(1) = 0.891$ [0.3451]	$\chi^2(1) = 1.784$ [0.1817]

Note: *** significant at 1%. ** significant at 5%. * significant at 10%. Robust standard errors shown in parentheses next to coefficient estimates. P-values shown is square brackets for the F-test and diagnostic tests.

the first place. The instrumental variables pass the over-identifying restrictions tests, and are generally correlated with the endogenous variables (the F-tests of the first-stage regressions are significant for the ENF_EXT and ENF estimations, but marginally insignificant for the ENF_EFF estimation).

Thus, our results do not show a significant association between stock market development and the powers afforded to Securities Regulators. The results are robust to controlling for GDP per capita and inflation, as well as to controlling for potential endogeneity of the legal variables.

5.4 Regulator Attributes

We next test for the effect of Regulator Attributes on market development. We find only weak evidence that regulatory attributes have a significant association with stock market capitalization. For example, in the separate OLS regressions the index of effectiveness of Regulator Attributes (REGATTR_EFF) is found positively and significantly associated with market capitalization. The aggregate index of Regulator Attributes (REGATTR) is also significantly associated with market capitalization, albeit at a lower level of significance. However, having controlled for GDP per capita and inflation, we do not find any of the legal indices significant.

Instrumenting for each of the three Regulator Attributes indices by TRANSPLANT_STATUS, we again find no significant association between stock market development and our legal indices of Regulator Attributes. The instruments

Table 11: Regulator Attributes and Stock Market Capitalisation, 1999. OLS Estimations

Independent variable	STOCK99	STOCK99	STOCK99	(4)	(5)
REGATTR_EXT	0.3279			0.1563	
	(0.3446)			(0.3736)	
REGATTR_EFF		0.1801**		0.0292	0.0549
		(0.0677)		(0.0852)	(0.0568)
REGATTR			0.3979*		
			(0.2205)		
VOUCHER	1.5975	1.4614	1.2048	6.4353	6.6851
	(7.7157)	(7.3418)	(7.5078)	(6.8349)	(6.4710)
Intercept	-16.8	-2.5 (4.9964)	-22.3	-18.3	-6.6*
	(29.9345)		(17.9893)	(28.1269)	(3.7085)
Number of observations	19	19	19	19	19
Adjusted R-squared	0.05	0.11	0.09	0.10	0.09

Note: *** significant at 1%. ** significant at 5%. * significant at 10%. Robust standard errors shown in parentheses next to coefficient estimates. Estimations (4) and (5)'s dependent variable is the residual of an OLS regression of (1) STOCK99 on the log of GDP per capita, inflation and a constant.

pass the over-identifying restrictions tests, but endogeneity is not confirmed. In addition, the F-tests of the first-stage regressions are insignificant.

These results indicate no particular role for the legal provisions about existence and independence of the Regulator, and some role for an effective Regulator (REGATTR_EFF is built upon answers to the question whether the Regulator has trained and knowledgeable professional staff). The basic OLS results, however, are not robust to controlling for GDP per capita, inflation, or endogeneity.

5.5 Aggregate Indices of Securities Regulation

In this sub-section we present evidence of the impact of the aggregate indices of securities laws and their enforcement on stock market development. Our results indicate that the aggregate measures of extent of securities laws, as perceived by the lawyers, and their enforcement exert a significant and positive impact upon stock market capitalization. The three OLS regressions, including EXTCAP99, EFFCAP99 and CAP99 one at a time, point to the significance of each of these indices. After controlling for GDP per capita and average inflation (equations 4 and 5 in Table 13), we find that in a joint specification both EXTCAP99 and EFFCAP99 lose significance (due to multi-collinearity). Omitting EXTCAP99 from the regression shows that the enforcement of securities laws (EFFCAP99)

Table 12: Regulator Attributes and Stock Market Capitalisation, 1999. Instrumental Variables (IV) Estimations Using 2SLS and TRANSPLANT STATUS as an instrument

Independent variable	STOCK99	STOCK99	STOCK99
REGATTR_EXT	0.4704 (0.8129)		
REGATTR_EFF		0.1417 (0.1777)	
REGATTR			0.3293 (0.4649)
VOUCHER	1.2468 (9.1022)	1.6626 (8.0508)	1.4114 (8.5000)
Intercept	-29.3 (69.8531)	0.6 (13.1399)	-16.4 (38.6576)
Number of observations	19	19	19
R-squared	0.04	0.11	0.09
F-test on first-stage equation	F(3, 15)=0.85 [0.4877]	F(3, 15)=2.03 [0.1528]	F(3, 15)=1.78 [0.1941]
Hausman test	0.02 [0.8926]	0.03 [0.8523]	0.01 [0.9035]
OIR test (Sargan test)	$\chi^2(1) = 2.548$ [0.1104]	$\chi^2(1) = 2.571$ [0.1088]	$\chi^2(1) = 2.604$ [0.1066]

Note: *** significant at 1%. ** significant at 5%. * significant at 10%. Robust standard errors shown in parentheses next to coefficient estimates. P-values shown is square brackets for the F-test and diagnostic tests.

regains significance, but at a lower level (10%) after controlling for economic development and macroeconomic stability.

The IV regressions, using the legal transplant dummies to instrument for aggregate securities laws extent and effective use, are in line with the OLS residual regressions. Only the enforcement of securities laws (EFFCAP99) is found significant (at the 10% level) after correcting for potential endogeneity. The test of over-identifying restrictions (OIR test) confirms that the instrument set does not affect STOCK99 through another channel other than securities law effectiveness, i.e. the instruments are not correlated with the error term. The associated p-value for the EFFCAP99 specification indicates that we cannot reject the null hypothesis of no correlation between the instruments and the error term in the structural equation, i.e. no separate impact of the instruments other than that through the endogenous variable.

The diagnostic tests again show no presence of endogeneity. The EFFCAP99 and the CAP99 regressions pass the Sargan test, whereas the EXTCAP99 regression does not pass the OIR test at the 10% level (although it passes at the 5% level), thus causing some doubts about the validity of the instruments in this regression. Finally, the F-tests for joint significance of the instruments and the VOUCHER dummy from the first-stage regression are significant for the EXTCAP99 and CAP99 regression, but marginally insignificant for the EFFCAP99 regression.

Despite the finding that endogeneity is not detected, we present all the IV results as a precaution.

Table 13: Aggregate Indices of Securities Regulation and Stock Market Capitalisation, 1999. OLS Estimations

Independent variable	STOCK99	STOCK99	STOCK99	(4)	(5)
EXTCAP99	0.9421**.			-0.1038	
	(0.3458)			(0.4185)	
EFFCAP99		0.7429***		0.4257	0.3781*
		(0.2101)		(0.2853)	(0.2112)
CAP99			0.9846***		
			(0.2901)		
VOUCHER	5.7735	5.3674	6.1138	8.2996	8.4806
	(6.5240)	(6.0441)	(5.9615)	(6.4352)	(6.3041)
Intercept	-60.4**	-28.3**	-53.3**	-17.4	-22.7*
	(24.9516)	(10.786)	(18.5369)	(24.3876)	(11.1161)
Number of observations	19	19	19	19	19
Adjusted R-squared	0.26	0.39	0.38	0.20	0.20

Note: *** significant at 1%. ** significant at 5%. * significant at 10%. Robust standard errors shown in parentheses next to coefficient estimates. Estimations (4) and (5)'s dependent variable is the residual of an OLS regression of (1) STOCK99 on the log of GDP per capita, inflation and a constant.

These results suggest two things: first, our aggregate legal indices affect stock market development as proxied by market capitalization positively and significantly. However, only the results of the enforcement of securities regulation are robust to controlling for economic development (log of GDP per capita) and inflation, and for endogeneity in the main model.

6 Conclusions

The results of this paper support previous findings in this field, e.g. Pistor et al. (2000) about the role of legal enforcement on financial market development in transition. Furthermore, our results are based upon disaggregated indices of stock market laws – such as information disclosure requirements, regulation of market intermediaries, Regulator's attributes and enforcement powers – and indicate that disclosure rules and intermediary regulation rules are significantly associated with market capitalization, usually through their enforcement component. We find weak evidence that Regulator's attributes and powers affect stock market development. Therefore, our study is supportive of recent findings, e.g La Porta et al. (2003), that private enforcement through stricter information disclosure and liability rules is associated with better stock market performance across a broad cross-section of countries (but not including the transition

Table 14: Aggregate Indices of Securities Regulation and Stock Market Capitalisation, 1999. Instrumental Variables (IV) Estimations Using 2SLS and TRANSPLANT STATUS as an instrument

Independent variable	STOCK99	STOCK99	STOCK99
EXTCAP99	0.3509 (0.4972)		
EFFCAP99		0.7469* (0.3805)	
CAP99			0.6639 (0.4190)
VOUCHER	3.6591 (6.1418)	5.3834 (5.1905)	4.9053 (5.2929)
Intercept	-14.9 (37.3163)	-28.5 (19.5713)	-32.0 (26.8604)
Number of observations	19	19	19
R-squared	0.16	0.39	0.34
F-test on first-stage equation	F(3, 15)=4.39 [0.0209]	F(3, 15)=2.10 [0.1426]	F(3, 15)=3.01 [0.0631]
Hausman test	1.70 [0.1928]	0.00 [0.9916]	0.55 [0.4572]
OIR test (Sargan test)	$\chi^2(1) = 2.804$ (0.0941)	$\chi^2(1) = 1.040$ (0.3077)	$\chi^2(1) = 2.307$ (0.1288)

Note: *** significant at 1%. ** significant at 5%. * significant at 10%. Robust standard errors shown in parentheses next to coefficient estimates. P-values shown is square brackets for the F-test and diagnostic tests.

economies). La Porta et al (2003) also establish that securities supervisory powers and attributes, as captured by their index of Public Enforcement, are not significantly associated with stock market development. Our results are in line with these findings, and help shed some more light by expanding the scope of these indices. For instance, we are able to assess the impact of better securities intermediary regulation, which has been discussed extensively in the literature, e.g. Glaeser et al. (2001) for Poland and the Czech Republic, by including some additional information and expanding the number of sample countries.

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Appendix A

Legal Indicator Survey 1999: Securities Markets Questions

Q1. Have securities laws or regulations been enacted or amended in the past 8 years? Y___ N ___U___

A 'Yes' answer gets 1, a 'No' answer carries 0, 'Unclear' is penalised at -1/6.

Omitted from aggregation of indices.

Q2. Is there a government agency or an independent body ("Regulator") that regulates securities operations (e.g., a securities commission)? Y___ N ___U___

A 'Yes' answer to part one carries 1, 'No' carries 0, 'Unclear' is worth -1/6.

Type of question: extensiveness

Q3. If yes, does the regulator have the ability to conduct on-site investigations and examinations of issuers?

Y___ N ___U___

If yes, does it regulate the offering of the following types of securities to the public:

Shares? Y___ N ___U___

Bonds? Y___ N ___U___

A 'Yes' answer to part 1 carries 0.50, and 0.25 each to parts 2 and 3. A 'No' carries 0, 'Unclear' is worth -1/6. Maximum overall is 1.

Type of question: extensiveness

Q4. Are securities sold, marketed or traded to the public through mechanisms other than a securities exchange?

Never Rarely Sometimes Frequently Almost Always

Never gets 0 points, Rarely gets 0.25, Sometimes gets 0.5, Frequently gets 0.75 and Almost Always gets 1.

Omitted from aggregation of indices.

Q5. Are publicly listed (traded) companies required to provide timely and accurate disclosure of financial results and other information to the public (e.g., information that is "material" to investor's decisions)? Y___ N ___U___

A 'Yes' answer carries 1; a 'No' is worth 0; 'Unclear' is penalised at -1/6.

Type of question: extensiveness

Q6.If yes, how often is this information provided to the public?

Never Rarely Sometimes Frequently Almost Always

Never gets 0 points, Rarely gets 0.25, Sometimes gets 0.5, Frequently gets 0.75 and Almost Always gets 1.

Type of question: effectiveness

Q7. Must publicly-traded companies use international accounting standards when preparing their financial statements? Y___ N ___U___

A 'Yes' answer carries 1; a 'No' is worth 0; 'Unclear' is penalised at -1/6.

Type of question: extensiveness

Q8. Is there a functioning clearance and settlement system for the following: (Please tick all that apply)

a) for shares?

b) for bonds?

Both options a) and b) carry 0.50 each; overall maximum is 1.

Type of question: effectiveness

Q9. Are companies required to file information with the Regulator prior to selling securities on the open market? Y___ N ___U___

If yes, what type of information must be provided:

a) Less than contained in the annual report?

b) More than contained in the annual report?

In what form must the information be provided (please tick all that apply):

c) Prospectus/Listing Particulars

d) Financial Statements

e) Other (e.g. Notice to Shareholders)

A 'Yes' answer to part 1 of the question is worth 0.25; option a) carries 0, option b) gets 0.25; options c) gets 3/8, d) gets 1/8 and e) gets 0. The maximum overall is 1.

Type of question: extensiveness

Q10. If yes, does the Regulator review and approve any of the information filed by a company prior to a public offering?

Never Rarely Sometimes Frequently Almost Always

Never gets 0 points, Rarely gets 0.25, Sometimes gets 0.5, Frequently gets 0.75 and Almost Always gets 1.

Type of question: effectiveness

Q11. Does the regulator have enforcement powers? Y___ N ___U___

If yes, do these enforcement powers include:

a) Authority to revoke an issuer's listing?

b) Authority to impose civil fines or penalties?

A 'Yes' answer to parts 1 gets 0.50; option a) is worth 0.15, option b) receives 0.35. A 'No' answer to part 1 is worth 0. 'Unclear' is penalised at -1/6. Maximum score is 1.

Type of question: extensiveness

Q12. Has the regulator (if any) undertaken any actual oversight or enforcement action under its regulatory powers within the past 5 years? Y___ N ___U___

A 'Yes' answer gets 1, a 'No' answer is worth 0. 'Unclear' is penalised at -1/6. Maximum score is 1.

Type of question: effectiveness

Q13. Is insider dealing prohibited? Y___ N ___

A 'Yes' answer to part 1 carries 1, a 'No' answer is worth 0.

Type of question: extensiveness

Q14. If yes, is it prohibited (please tick all that apply):

a) By legislative act?

b) By administrative rules or regulations?

c) By securities exchange rules?

d) By private law?

e) By criminal law?

Each option from a) to e) is worth 0.20. Maximum score is 1.

Type of question: extensiveness

Q15. How frequently does the Regulator use its enforcement powers if there is a problem of insider dealing or fraud?

Never Rarely Sometimes Frequently Almost Always

Never gets 0 points, Rarely gets 0.25, Sometimes gets 0.5, Frequently gets 0.75 and Almost Always gets 1.

Type of question: effectiveness

Q16. Is there (or are there) a functioning stock exchange(s) in your jurisdiction? Y___ N ___U___

A 'Yes' answer gets 1, a 'No' answer carries 0, 'Unclear' is penalised at -1/6.

Omitted from aggregation of indices.

Q17. Do the capital markets or securities laws regulate the conduct of intermediaries such as brokers and dealers? Y___ N ___U___

If yes, must brokers or dealers obtain a license? Y___ N ___U___

If yes, are brokers required to have professional qualifications? Y___ N ___U___

A 'Yes' answer to the first two parts gives 0.25; a positive answer to part 3 of the question gets 0.50. 'No' answer carry 0. Unclear' answers are penalised at -1/6. Maximum score is 1.

Type of question: extensiveness

Q18. Have any brokers had their licenses revoked by the Regulator or any other self-regulatory organisation?

Never Rarely Sometimes Frequently Almost Always

Never gets 0 points, Rarely gets 0.25, Sometimes gets 0.5, Frequently gets 0.75 and Almost Always gets 1.

Type of question: effectiveness

Q19. Are there self-regulatory organisations that have oversight responsibilities over market participants in specific sectors? Y___ N ___U___

A 'Yes' answer gets 1, a 'No' answer is worth 0. 'Unclear' is penalised at -1/6. Maximum score is 1.

Type of question: effectiveness

Q20. Are collective investment schemes (e.g., pension funds or mutual funds) authorised in your jurisdiction? Y___ N ___U___

If yes, what type are in existence (if any)

a) State-sponsored?

b) Private schemes?

c) Both private and state-owned?

A 'Yes' answer to part 1 gets 0.50, option b) is worth 0.50 too, options a) and c) get 0. The maximum score is 1.

Type of question: extensiveness

Q21. Are there separate rules and regulations for the licensing and regulation of investment funds or collective investment schemes? Y___ N ___U___

A 'Yes' answer gives 1, a 'No' answer is worth 0, 'Unclear' is penalised at -1/6.

Type of question: extensiveness

Q22. In practice, do collective investment schemes provide material and accurate information to members of the public?

Never Rarely Sometimes Frequently Almost Always

Never gets 0 points, Rarely gets 0.25, Sometimes gets 0.5, Frequently gets 0.75 and Almost Always gets 1.

Type of question: effectiveness

Q23. Are the issuers for collective investment schemes also required to disclose material information to the investor? Y___ N ___U___

A 'Yes' answer gives 1. 'No' is worth zero, 'Unclear' is penalised at -1/6.

Type of question: extensiveness

Q24. Does an investor compensation scheme exist to protect investors in the event of a failure of a securities market intermediary (e.g. an investment firm)?

Y___ N ___U___

A 'Yes' answer gives 1. 'No' is worth zero, 'Unclear' is penalised at -1/6.

Type of question: effectiveness

Q25. Have there been recent failures (in the past 3 years) of securities market intermediaries? Y___ N ___U___

Omitted from aggregation of indices.

A 'No' answer gets 1, 'Yes' is worth zero, Unclear is penalised at -1/6.

Q26. If yes, have investors been able to receive compensation for their losses?

Never Rarely Sometimes Frequently Almost Always

Never gets 0 points, Rarely gets 0.25, Sometimes gets 0.5, Frequently gets 0.75 and Almost Always gets 1.

Type of question: effectiveness

Q27. Is there a legal basis for the provision of professional custodial services (e.g. shareholder depository)? Y___ N ___

If yes, is such a system in operation? Y___ N ___

A 'Yes' answer to both parts carries 0.50, a 'No' answer carries 0. Maximum score is 1.

Type of question: part1 extensiveness, part 2 effectiveness.

Q29b. Are there trained and knowledgeable staff in agencies that regulate:

Securities firms and intermediaries? Y___ N ___

A positive answer carries 0.50, a negative answer is worth zero. Maximum overall is 0.50.

Type of question: effectiveness

Appendix B

Table 15: A Comparison of Securities Law LIS Questions and Other Related Studies

LIS Qn No.	Belongs to	Question on	Relevance to	Black (2001)	La Porta et al. (2003)
Q2	Regulator Attributes	Independent Securities Regulator exists	extensiveness	honest, well-resourced Regulator	Part of Regulator Attributes sub-index
Q3	Regulator Attributes	Regulator authorized to conduct on-site examinations of issuers; regulates bond and share issues	extensiveness	does not cover	Investigative Powers sub-index; focused regulator
Q29b	Regulator Attributes	Regulator has professionally trained staff	effectiveness	core institution	does not cover
Q5	Disclosure Requirements	Publicly traded firms must disclose financial information in a timely manner	extensiveness	extensive financial disclosure	stresses importance
Q6	Disclosure Requirements	Frequency of information disclosure by companies in practice	effectiveness	does not cover	stresses importance
Q7	Disclosure Requirements	Publicly traded firms must use IAS to prepare financial statements	extensiveness	core institution	does not cover
Q8	Disclosure Requirements	Operational clearance and settlement system for trade in shares and bonds	effectiveness	stresses importance of market transparency of trades	does not cover
Q9a	Disclosure Requirements	Publicly traded firms must file information with Regulator prior to securities issue	extensiveness	stresses mandatory disclosure	covers specific disclosure requirements
Q9b	Disclosure Requirements	Mandatory filing of prospectus and financial statements	extensiveness	stresses importance	codes delivery of prospectus by promoters

Q10	Disclosure Requirements	Frequency of disclosure and regulatory approval prior to securities issue	effectiveness	does not cover	does not cover
Q11	Enforcement Powers of Regulator	Regulator enforcement powers, which include authority to revoke licenses and impose civil fines	extensiveness	does not cover	"Orders" sub-index, non-criminal sanctions
Q12	Enforcement Powers of Regulator	Regulator has used its enforcement powers	effectiveness	does not cover	"Orders" sub-index
Q13	Enforcement Powers of Regulator	Insider dealing prohibited	extensiveness	core institution	does not cover
Q14	Enforcement Powers of Regulator	Comprehensive ban on insider dealing through criminal and civil law	extensiveness	core institution; stresses criminal sanctions	stresses criminal sanctions in general
Q15	Enforcement Powers of Regulator	Frequency of Regulator's intervention in cases of insider dealing	effectiveness	core institution; stresses enforcement	does not cover
Q17	Regulation of Market Intermediaries	Securities laws regulate conduct of market intermediaries; mandatory licensing and standards	extensiveness	useful institution	does not cover
Q18	Regulation of Market Intermediaries	Frequency of intermediary licenses being revoked by Regulator	effectiveness	useful institution	does not cover
Q19	Regulation of Market Intermediaries	Intermediaries subject to mandatory self-regulation	effectiveness	useful institution	does not cover
Q20	Regulation of Market Intermediaries	Private investment and pension funds authorized	extensiveness	useful institution	does not cover
Q21	Regulation of Market Intermediaries	Separate rules for licensing of investment and pension funds	extensiveness	does not cover	does not cover
Q22	Regulation of Market Intermediaries	Frequency of information disclosure by investment and pension funds	effectiveness	does not cover	does not cover

Q23	Regulation of Market Intermediaries	Issuers of securities for investment and pension funds subject to disclosure	extensiveness	does not cover	does not cover
Q24	Regulation of Market Intermediaries	Investor compensation scheme exists	effectiveness	does not cover	stresses importance
Q25	Regulation of Market Intermediaries	Number of market intermediary failures	outcome	does not cover	does not cover
Q26	Regulation of Market Intermediaries	Frequency of investor compensation for losses due to intermediary failure	effectiveness	does not cover	stresses importance
Q27a	Regulation of Market Intermediaries	Law provides for shareholder depository	extensiveness	useful institution for market transparency	does not cover
Q27b	Regulation of Market Intermediaries	Shareholder depository in operation	effectiveness	useful institution	does not cover