A comparative analysis of stock market development: The impact of formal and informal institutions

Abstract

In light of theory and evidence that the functioning of stock markets affect firm's financing decisions, and economic growth, we aim to link institutional quality to capital markets. In that respect, we analyzed 3,244 newspaper articles to run a comparative empirical analysis on the relation between the mindset of a population towards capital markets, as a proxy for informal institutions, the Heritage Foundation's Index of Economic Freedom, as a proxy for formal institutions, and stock market development in Austrian and Poland. Our results show positive and significant direct effects of formal and informal institutions on stock market development, where both differ for Austria and Poland. Furthermore, we theoretically explain and empirically examine how both institutional dimensions interact with each other, by showing that the societal mindset of a population towards capital markets positively influences the relation between formal institutions and stock market development.

Keywords: stock market development, comparative analysis of institutions, formal and informal institutions, content analysis

1 Introduction

Literature has identified a causal relationship between financial development and economic growth along three lines: (i) financial deepening promotes economic growth; (ii) economic growth stimulates financial development; and (iii) financial development and economic growth influence each other (**?**). In light of this background, stock markets have received a great deal of attention, both as a source of financial development and ultimately economic growth. In fact, banking and stock markets contribute vastly to the transformation of savings into investment, thereby enabling financial development and economic growth (**?**). With the existence of financial markets, more capital can be allocated to productive investments, which raises the rate of economic growth (**?**). Therefore, an economy with well-functioning financial markets will experience a higher growth rate of productivity (**?**). In addition, the accelerating pace of global capital market integration has had a profound impact on the strategies of firms accessing capital resources. Today, with the lowering of institutional barriers, e.g. the EU single market for capital, the number of capital markets, firms consider for a public offering, have increased. Due to this globalization of the capital raising process, stock markets compete for additional companies, where firms are especially attracted by stock markets that are more liquid and have a higher market capitalization (**??**). As a consequence, prior research has tried to define the reasons behind differences in stock markets' development, where institutional and macroeconomic factors have been found to be the most important driving forces (**?**). However, the institutional literature has given much attention to the influence of national and international regulations (e.g. **??**), whereas social and cultural factors have not entered the academic discussion sufficiently.

Therefore, in light of theory and evidence that the functioning of stock markets affect firm's financing decisions, and economic growth, we expand the current literature, by linking a societal characteristic to capital markets. More specifically, we add a population's mindset towards capital markets as an additional factor in the explanation of stock market development. Furthermore, we propose that the quality of the broader set of formal institutions

within a country encourages stock market development by reducing uncertainty for economic agents. However, the relationship between formal institutional quality and stock market development is enabled and constrained by the societal mindset of a population (**?**).

To understand the mechanisms behind the influence of social, cultural and cognitive factors in the process of stock market development, we use institutional theory, which establishes that organizations are embedded within broader social structures, comprising different types of institutions that exert significant influence on the decision-making of corporations (**?**). Furthermore, institutional theory proposes that any institution is supported by regulative, normative, and cultural-cognitive legitimacy, where each serves a specific sociological or psychological function that supports the institution (**?**). Hence, institutions, of which capital markets are one example, are established to the degree to which they are supported by these three elements (**?**). In that respect, **?** proposed a classification of formal and informal institutional forces, where the former refer to legal institutions, laws, and regulations and the latter to values, beliefs, customs, traditions, and codes of conduct (**?**). Hence, regulative legitimacy is directly related to the formal dimension, whereas normative and cultural-cognitive legitimacy refer to the informal dimension.

Based on this theoretical angle, we conducted a comparative empirical analysis on the relation between formal and informal institutions and stock market development in Austria and Poland. The classification into formal and informal institutions offers three advantages for our analysis. First, the different institutional characteristics are clearly defined and avoid any confusing overlap (**?**). Furthermore, the framework focuses on national institutions and thus lends itself to a country-level analysis (**?**). Third, the approach allows for consistency and clarity in analyzing differences within national contexts (**?**). The analysis builds on quarterly time-series data from the Austrian and the Polish capital markets between 2003 and 2012, a period, both markets sought for additional market capitalization and/or trading volume through the economic potential of the former communistic region of Central and Eastern Europe. However, although both markets are comparable in size, investor base

and strategic intend, they show different institutional characteristics. Austria, known as an established and mature capital market, already developed a comparatively high level of laws and regulations, whereas Poland was still building up reputation by implementing a number of profound structural changes (e.g. EU accession). On the contrary, Poland managed to create a market-oriented societal mindset, which was not present in Austria during the time of our observation (see figure 3). The differences in the institutional dimensions serve as a unique research setting in explaining the relation between formal and informal institutions and stock market development. Fixed effects regression analysis is chosen as the main method of analysis, where the market capitalization ratio and the value traded ratio serve as dependent variables. In order to evaluate the institutional characteristics, we analyzed and coded 3,244 newspaper articles of the leading business press in Austria and Poland as a proxy for informal institutions and used the Heritage Foundation's Index of Economic Freedom as a proxy for formal institutions. Several macroeconomic control variables are chosen to increase validity of the data analysis.

Altogether, we add to the understanding of the relation between formal and informal institutions and stock market development, through the comparison of a mature and a transition market with different societal mindsets towards capital markets. However, in contrast to previous studies (e.g. **??**), we focus not only on regulative legitimacy, but also on normative and cultural-cognitive legitimacy. By assessing changes in societal attributes and legal frameworks, we offer a comprehensive theory for predicting and assessing the different development of national capital markets. In particular, the academic contribution of this paper is three-fold: (a) it provides evidence on the relation between formal and informal institutions and stock market development by integrating a societal explanation, (b) it theoretically explains and empirically examines how formal and informal institutional dimensions interact with each other, and (c) it examines differences of the institutional effects between a developed and a transition market. However, the paper is not only relevant for academia, but also for stock exchange managers, public policy makers, and international companies seeking

for a public listing. Understanding the effect of formal and informal institutions on stock market development not only enables companies to find the best possible listing location, it also enables stock exchange managers and public policy makers to improve the success of the respective stock exchanges. Therefore, the agenda of this research is to assess the influence of informal institutions on the diffusion of stock markets by bringing institutional theories of legitimacy in the field of capital markets. Furthermore, the examination of institutions in the realm of capital market legitimation is important for financial development, and consequently economic growth (**?**).

The paper will continue by taking together relevant literature and theory and the development of the hypotheses. Subsequently, it will present the data and research methodology, followed by empirical results in chapter 4. Finally, a discussion of the results, implications, limitations and some concluding thoughts will finalize the paper.

2 Theory and Hypotheses

2.1 Theoretical background

To explain the development of capital markets, we draw from theories of legitimation in sociology. Legitimation is the process of making a practice or institution socially, culturally, and politically acceptable within a particular context (**??**). Since **?** initially theorized legitimacy, the term has been refined into a multidimensional construct. Previous research has examined three types of legitimacy: regulative, normative, and cultural-cognitive (**??**). Regulative legitimacy is the degree to which an organization adheres to "explicit regulative processes: rule-setting, monitoring, and sanctioning activities" (**?**). These activities are overseen and enforced by superordinate institutions, such as governments or regulatory agencies. Normative legitimacy is the degree to which an organization adheres to the norms and values in the social environment (**?**). Normative legitimacy is distinct from regulative legitimacy in that it does not require the sanction of a supra-ordinate institution. Last, cultural-cognitive

legitimacy is the degree to which an organization is known and understood by social actors. Both cognitive and cultural elements fall under this pillar, because, though cognitive schema exist individually, these schemes are created and reinforced through cultural processes and representations (**?**). Cultural-cognitive legitimacy often works in tandem with normative legitimacy. However, it is different from normative legitimacy in that it is deeply taken for granted at a tacit, cognitive level (**?**). In line with prior international business and finance research, we adhere to the classification of **?** and differentiate between formal and informal institutions. In that respect, formal institutions refer to laws and regulations of a particular country and correspond to the regulatory dimension in Scott's classification. On the contrary, informal institutions result from values, beliefs, customs, traditions, and codes of conduct (**??**) and, hence, correspond to the normative and cultural-cognitive dimensions in Scott's classification. Many scholars refer to informal institutions, broadly, as cultural institutions (**?**), where culture is often defined as a system of shared values, beliefs, and attitudes that influences individual perceptions and behaviors. However, although culture may be an important determinant in explaining the level and evolution of informal institutions, cultural attributes are just one part of a societies common behavior, where also social and cognitive factors are present. While the impact of societal difference on consumer and organizational behavior has received considerable research attention, it is increasingly being recognized that it may have an equally important effect on the behavior of financial market actors. In that respect, a number of organizational theorists have put forward a sociological perspective on corporate and investor behavior questioning the rather simplified, rational assumptions of the dominating financial economics research. However, although the process of legitimation seems especially important for emerging markets, also mature markets are confronted with changes in legitimacy over time. As a consequence, changes in legitimacy of capital markets influence corporate and investor behavior and, hence, the development of stock markets over time.

2.2 Institutions and stock market development

As noted by **?** ''institutions exist to reduce uncertainty in the world'' and in doing so provide incentives and disincentives for engaging in certain behavior and activities. Therefore, we define institutional quality as the degree to which institutions reduce uncertainty for economic decision-makers and offer incentives for productive and innovative behavior. Higher certainty implies lower transaction costs, which makes economic projects more profitable and hence more likely to be undertaken. By affecting the expectations of economic agents, it also allows agents to use a longer time horizon, through the stability that institutions provide (**?**). Thus, by giving political and economic actors incentives to behave honestly and predictably, high-quality institutions help to ensure that consequences of economic undertakings are more easily foreseen and that incentives stimulate productive rather than unproductive behavior (**?**). However, institutional quality is multidimensional, and higher certainty and incentives for productive behavior may arise on the basis of many institutional characteristics, including formal and informal ones (**?**).

2.2.1 Formal institutions

Formal institutions are intended to provide rules of economic transactions and to regulate behavior of the actors involved in the economic exchange (**?**). In the case of stock market development, this will include decision makers of the issuing firm and potential investors (**?**). Formal institutional elements include rules, sanctions, and legal requirements that tend to codify socially accepted corporate behavior (**?**). In the law and economics literature (e.g. **??**) formal institutions, specifically laws and regulations that protect minority shareholders have been shown to influence variation in stock market development across countries.

However, regulations concerning investor protections are only one distinct aspect of a country's formal institutional environment, and are likely to be influenced by the quality of associated institutional dimensions that are present in a national context. Indeed, economic agents generally inform their decisions by evaluating the overall formal institutional environ-

ment, rather than just evaluating a single aspect (**?**). In that respect, the effectiveness of laws and regulations depends on how they are enforced and how investors assess the level of law and order, referred to as the "rule of law" in a country. Furthermore, the extent to which there are commitments to develop, implement, and enforce laws to protect investors is largely a function of the prevailing political system in a given country, including its level of stability in staying in power. For these reasons, we conceptualize formal institutions as a holistic set of ''attributes of legislation, regulation, and legal systems that condition freedom of transacting, security of property rights, and transparency of government and legal processes'' (**?**).

If the quality of these formal institutions is poor, for example if corruption is high and/or governments are unable to implement policies that enforce contractual rights, the level of uncertainty will be higher, requiring issuers and potential investors to bear more risk associated with the related transactions (**?**). On the other hand, if the quality of the set of formal institutions in a country is high, this can assure firm decision makers and potential investors that valuation of the firm is fair and legitimate (**?**).

Thus, the higher the quality of the formal institutions, the lower the uncertainties for the issuing firm and the potential investors, resulting in less potential for opportunism, lower transaction costs, and greater possibilities for achieving the desired rewards (**?**). Therefore, we propose that it is the quality of the broader set of formal institutions that encourages stock market development by reducing uncertainty associated with valuation of firm equity and increasing the likelihood of fair and appropriate distribution of returns to the involved parties.

H1: There is a positive relationship between the quality of formal institutions and stock market development.

2.2.2 Informal institutions

Informal institutions are patterns of common behavior, and socially shared rules that are often enacted outside of official channels (**?**). In that respect, research has shown that informal institutions "elicit shared cognitive and normative frameworks among economic agents" (**?**). Institutional theory argues that in economic transactions, actors respond not only to formal institutions, but also to informal ones (**?**). Hence, firm decision makers and investors will not only objectively evaluate how formal institutions impact the acceptability of stock market activities, but will also be subjectively influenced by the values, norms, beliefs and assumptions that constitute their national society (**?**). In that respect, nations are assumed to consist of shared cognitive structures of individual market actors, where cognitive structures are conceptual interrelated representations of objects, persons, actions, or events (**?**). Cognitive processes, such as perception, expectation formation, development of different alternatives in strategic choice, or learning activities are closely linked to cognitive structures, as decision makers rely on existing cognitive structures in their decision process. However, these structures simultaneously are the result of former cognitive processes (**?**). As a consequence, informal institutions are supposed to vary over time, as cognitive processes and external circumstances change the cognitive structures of a society. Therefore, we refer to informal institutions through the societal mindset towards capital markets, where national culture may explain part of the differences in the cognitive structures between different countries. The mindset of the population towards capital markets seem to be an especially important societal determinant of stock market development in transition economies, as a free market perception had to be developed from scratch since the fall of the communistic regime. Going public means opening the firm to an extended external market associated with lots of competition, which presents new challenges for firms, but at the same time offers more opportunities for performance improvement (**?**).

Thus, societies that are more capital market oriented, make the going public decision a more desirable and legitimate course of action for companies, resulting in a higher stock

market development. Similarly, investors in capital market oriented societies are likely to have a more favorable view of listed firms. Therefore, we expect founders and managers to be more likely to view the stock market as an opportunity to create a context for continuous improvement and monetary gain, if the mindset towards capital markets is relatively more positive.

H2: There is a positive relationship between the societal mindset of a population towards capital markets and stock market development.

2.2.3 Formal and informal institutions

Although formal institutions are relatively stable once established, they are based on the shared cognitive understandings and acceptance of individuals in the society, both of which evolve and produce change (**?**). In that respect, **?** suggest that informal institutions "may do the enabling and constraining that is widely attributed to formal institutions." When the formal institutions no longer provide acceptable solutions, individuals seek new solutions that fit the evolving social context of the society (**?**). Therefore, societal influences provide a foundation that shapes how a country's people view the world (**?**), determines how they make sense of events occurring in that world (**?**), and helps them interpret the explanations offered by others (**?**). Hence, the societal mindset serves as a base for the development of formal institutions by influencing what problems are identified, their perceived importance (**?**), the generation of potential solutions for them (**?**), the evaluation of such solutions (**?**), and the behaviors enacted to implement the solutions (**?**). Through this process, formal institutions reflect, embody, and reinforce the country's informal institutions (**?**).

Thus, the societal mindset towards capital markets shapes the way how formal institutions are created in respect to stock market development. However, prior research also indicated a reverse direction in the sense that formal institutions also reinforce a population's mindset. Hence, we propose that formal and informal institutions are mutually reinforcing each other.

H3: The relationship between the quality of formal institutions and stock market development is higher if the societal mindset towards capital markets is higher.

2.2.4 Country differences: Austria vs. Poland

There is no doubt that the institutions of a given society affect the path of its stock market development by structuring political, economic, and social interactions among its members (**?**). As such, institutions can either promote stock market development or retard it. Thus, one of the critical factors that the developing countries must undertake to bring about stock market development is to introduce "correct" institutions in three areas: market regulation, market stabilization, and market legitimization (**?**). In that respect, empirical research demonstrates that the poorer the country and the longer the wait for institutional development, the higher the influence of institutions on economic growth (**??**). Similarly, **?** indicate that institutions are statistically significant determinants of growth in developed and developing countries, but their importance depends on the the state of economic transition. Also **?** indicate that the impact of institutional quality is more important for medium-income countries than for rich countries. However, he posits a U-shaped effect as there would be no effect for countries with very low levels of per capita income, a high effect in medium-income countries, which is decreasing after a certain level of development is reached.

Furthermore, as it is reasonable to say that institutions work through expectations, it may be the case that the effect of institutions on stock market development depends on the trend of the institutional development (**?**). In asserting that actual institutions in the poorest countries on average are better than they are perceived to be by international investors (**?**), a positive trend may be particularly important in a developing context. This draws investors' attention to institutional improvement in a country previously dismissed as too uncertain for investments, which is especially important for countries that have historically suffered from unstable and changing policies (**?**).

Therefore, we propose that due to the different economic state of Poland and Austria,

both countries differ in the extent formal and informal institutions influence stock market development. In more detail, the Polish capital market, as a transition market, is expected to react more sensitive to changes in the institutional quality as compared to its Austrian counterpart.

H4a: The relation between the quality of formal institutions and stock market development is higher for less developed economies.

H4b: The relation between the societal mindset of a population towards capital markets and stock market development is higher for less developed economies.

3 Data and Methodology

3.1 Data and sample

In the realm of legitimacy in capital markets, transitional economies of Central and Eastern Europe provide a very suitable source of information, as they had to build up their capital markets and the responding market oriented mindset of the populations after the fall of the communistic regime. However, after signing the 2004 enlargement of the European Union in April 2003, also Western European countries, and especially Austria, sought for additional growth perspectives through the economic growth in Central and Eastern Europe. As a consequence, Poland and Austria showed similar attributes of size, liquidity and strategic intend, but on the basis of completely different regulatory, social and cultural characteristics. Hence, our research setting enables us to study the influence of formal and informal institutions on stock market development, within a comparative analysis of a developed and a transition capital market.

For the testing of our hypotheses, we use country-quarter observations of Austria and Poland. Our data is compiled from several sources, where stock market and economic data is taken from the Eurostat database. The main advantage of this dataset is the availability of quarterly numbers of market capitalization and value traded between 2003 and 2012 (in com-

parison to yearly data of e.g. World Bank). This recent time period is especially appropriate for the study of formal and informal (sociocultural) institutions, as financial globalization became particularly salient (**?**). The formal institutional quality is measured and downloaded by the Heritage's Foundation Index of Economic Freedom, which is published on a yearly basis (**?**).

The societal mindset towards capital markets is measured through newspaper articles provided by the Factiva database. Thereby, we argue that the public sphere constitutes the primary space in which meaning is constructed and negotiated, problems and solutions are discussed, and responsibilities and competences are contested (**?**). The media represents a structured social space with specific logics and characteristics (**?**). It is "a site on which various social groups, institutions, and ideologies struggle over the definition and construction of social reality" (**?**). As public documents aim at providing unbiased, truthful accounts, newspaper articles meet the criteria for historical analysis of competence, objectivity, and reliability (**?**). Although the content of newspaper articles is constructed by the interests and agendas of particular journalists (**?**), in the aggregate, it can be and has been used as a reliable indicator of generalized public opinion (**?**). Unlike niche communications, such as blogs, magazines, or legal documents, this kind of mass-media discourse has particular relevance when studying public opinion because it both reflects and influences public perceptions (**?**).

3.2 Dependent variables

Stock market development refers to the importance and strength of capital markets in an economy, and has been examined in a number of empirical studies. The motivation for examining stock market activity is that it directly reflects the extent to which market participants actually use stock markets. The spirit of our analysis is consistent with the simple question of whether regulative, normative and/or cultural-cognitive legitimacy of capital markets is associated with market participants' willingness to list on or invest in national stock markets. Many studies focus on public equity markets, using a variety of market development

proxies. However, **?** notes that the most commonly used proxies are stock market size and liquidity. Therefore, we compute market development with two different variables that are "traditional" market development measures: (1) market capitalization ratio, and (2) value traded ratio (see figure 1). As both countries of analysis only have one stock exchange, we do not have to care about measuring country or exchange level data. The two measures are described in more detail below:

(1) The market capitalization ratio equals the value of listed shares divided by GDP. We use the market capitalization ratio as a measure of market size. Although large markets do not necessarily function well, many observers use the market capitalization ratio as an indicator of stock market development under the assumption that stock market size is positively correlated with the ability to mobilize capital and diversify risk (**?**).

(2) The value traded ratio equals the total value of trades on the stock market exchange divided by GDP. The value traded ratio measures the organized trading of firm equity as a share of national output. While not a direct measure of trading costs or the uncertainty associated with trading on a particular market, the assumption behind the value traded ratio is that it positively reflects liquidity on an economy-wide basis. Liquidity is widely viewed as one of the most important, yet difficult to measure, elements of stock market development. Although there is no single definition of liquidity, the concept is generally associated with market efficiency and low transaction costs. The value traded ratio complements the market capitalization ratio in the sense that, although a market may be large, there may be little trading. Thus, taken together, the market capitalization and the value traded ratio provide more information about a country's stock market than if one uses only a single indicator (**?**).

Figure 1 is near here

3.3 Explanatory variables

3.3.1 Formal institutions

To capture the level of formal institutional quality, we use the Heritage Foundation's Index of Economic Freedom. The Heritage Foundation measures economic freedom based on 10 quantitative and qualitative factors, grouped into four broad categories, or pillars, of economic freedom. These four categories are "Rule of Law (property rights, freedom from corruption)", "Limited Government (fiscal freedom, government spending)", "Regulatory Efficiency (business freedom, labor freedom, monetary freedom)", and "Open Markets (trade freedom, investment freedom, financial freedom)", and each of the ten economic freedoms within these categories is graded on a scale of 0 to 100 (**?**).

As the focus of our study is not to examine how any specific institutional policy or rule affects stock market development, but rather how stock market development is driven by a country's entire set of political, legal, and economic policies, as well as regulations, laws and enforcement of such rules, we use a composite index (**?**). The use of an aggregated measure also allows us to capture the multifaceted nature of formal institutions, as the focus of this study is to evaluate how a country's stock market development is influenced by formal forces directly and in interaction with the informal sociocultural institutions. Hence, a country's overall score is derived by averaging the ten economic freedoms, with equal weight being given to each (see figure 2).

Figure 2 is near here

3.3.2 Informal institutions

To study the sociocultural mindset towards capital markets, we evaluated newspaper articles from the Factiva database that contained the keyword "capital market" (or abbreviations) in their title or lead paragraph (n = 3,244). Multiple newspapers were chosen for corroboration

(**?**), where we identified five leading newspapers, "Der Standard", "Die Presse" and "Das Wirtschaftsblatt" in Austria and "Rzeczpospolita" and "Gazeta Wyborcza" in Poland. These are the main daily and nationwide business newspapers in the respective countries, which were available through the whole period of investigation. For the analysis of the articles we employed two categorical variables: "content" and "sentiment". The category "content" was used to identify articles that are related to capital markets and are displaying the mindset of the population, rather then just reporting facts and figures. Therefore, we eliminated 116 articles only acquired due to data extraction failures, like double entries or wrong regional assignment. 776 articles with a content that was not related to capital markets, in the sense of a misleading keyword were also eliminated. Additionally, we also eliminated articles, which are not displaying the mindset of the population, but rather the coverage of capital market related facts and figures (e.g. financial market reports or corporate articles), reducing the final sample size to 1,558 articles. Afterwards, each newspaper article was coded to the notion it transported. Although the evaluative standpoint concerning capital markets is often a consequence of interpretive packaging, in principle, each article can be used to construct pro, contra, or neutral interpretations (**?**). Thus, each article was coded according to the position it adopted on the issue (positive, negative or ambivalent/neutral). With the help of the positions of the articles we calculated yearly Janis-Fadner coefficients of imbalance (**?**). We chose to use Janis-Fadner coefficients on a yearly basis, to consider the rather slow change of cognitive structures in society and to control for possible time delays between the decision of company managers and the impact on the stock market. This assumption, limited the sample period of our study to 37 quarters per country, ranging from the fourth quarter of 2003 till the fourth quarter of 2012. The Janis-Fadner coefficient ranges from -1 to +1, where a high presence of favorable articles yields a value closer to +1, and a high presence of unfavorable articles yields a value closer to -1. The formula is as follows:

$$Janis - Fadner\ coefficient\ =\ \frac{(e^2-ec)}{(e+c)^2}\ if\ e > c;\ \frac{(ec-c^2)}{(e+c)^2}\ if\ e < c;\ 0\ if\ e = c$$

where e is the annual number of favorable articles and c is the annual number of unfavorable articles (see figure 3). To check for the reliability of the coding, inter-coder reliability has been measured using Cohen's Kappa values. In that respect, all values are above 0.5 and at least at a moderate level (**?**).

Figure 3 is near here

3.4 Control variables

We include several time-varying macro-economic factors that have been found to be relevant to stock market development:

Income In that respect, previous research has demonstrated that income has a positive impact on stock market development, as higher income is usually associated with better institutions. Furthermore, the usual business cycle mechanics influence the stock market development. The more flourishing companies that are quoted on the stock market, the higher the propensity to invest in the stock market (**?**). The income level is measured as GDP per quarter in constant Euros (base year 2005).

Inflation Inflation is commonly included as a measure of macroeconomic stability. The inflation rate, which might proxy for inflation variability, is included because it may distort decision-making. In particular, moderate to high inflation may discourage financial intermediation, and encourage saving in real assets (**?**).

Trade openness **?** indicate that trade openness explains significantly the development of stock markets. They find that there is a significant development of stock markets in periods of increasing trade openness which was interpreted as a consequence of increasing competition and of incumbent's loss of strength. Similar to **?**, we use the ratio of exports plus imports over GDP to measure trade openness.

3.5 Estimation methodology

Our data set includes 10 years of quarterly observations for Austria and Poland, where all variables are measured at the country level. To account for within and between variation among observations, we use a fixed effects linear regression model, where we approach within country variation by controlling for a country dummy (0 for Austria and 1 for Poland). As the time period studied comprises a turbulent phase for financial markets, especially due the recent financial crisis, we also account for time-variant omitted variables by including time-fixed effects into our analysis.

Furthermore, there may be an endogeneity problem in the regression analysis. In that respect, it is possible that an increased stock market development leads to better formal institutions rather than formal institutions leading to stock market development. This is also transferable to the newspaper sentiment, where a better stock market development may lead to a more positive notion of articles and not that the societal mindset of the population towards capital markets would cause stock market development. A lagged dependent variable would pick up at least some of this effect (**?**). Hence, we control for reverse causality by measuring our independent variables at time t, and we utilized stock market development at time $t + 1$.

4 Results

4.1 Descriptive statistics

Table 1 and 2 report some descriptive statistics for the variables in our study, averaged over the sample period of Q4 2003 to Q4 2012. Stock market capitalization is on average very similar between Austria and Poland, where the Vienna Stock Exchange had a higher stock market development till the financial crisis and afterwards lost its leading position in stock market size on behalf of the Warsaw Stock Exchange (see figure 1). As expected, institutional quality is higher for Austria than for Poland, where Austria has good or at least

moderately good institutions, and Poland is supposed to have mostly weak to moderately good institutions[1]. On the contrary, the informal institutional quality appears to be higher in Poland than compared to its Austrian counterpart. Even in times of financial crisis, the Polish population has a positive mindset towards capital markets, which exceeds by far the mindset of the Austrian population. The control variables are heavily in line with what we expected. Income is very stable and way higher for Austria, which supports our notion of comparing a developed with a transition economy. Also inflation is lower in Austria and trade openness is higher in Austria during our sample period. This is in line with the notion that more developed economies show a lower inflation rate, but a higher trade openness.

Table 1 and 2 are near here

4.2 Regression results

In order to examine the inter-relationships between variables, we conducted a hierarchical regression analysis. In order to verify two-way interactions described in Hypothesis 3 and 4, we followed suggestions by **?** to graph the interactions, which is illustrated in figure 4. Table 3 and 4 present the estimation results. Table 3 shows results for the market capitalization ratio and table 4 provides the results for the value traded ratio. To illustrate the examined results, we performed a hierarchical regression analysis that controls for generally accepted, macroeconomic predictors of stock market development. The first model in both tables contains only control variables. In models 2 and 3 we add the main effects of formal institutions, as well as the informal sociocultural mindset towards capital markets. In the subsequent models we add the hypothesized interaction effects.

As both indicators for stock market development, the market capitalization ratio and

[1]The Heritage Foundation considers countries that score in the range of 80–100 as having the best ("most free") institutions; those in the range 70–79.9 have good institutions, and countries in the range 60–69.9 have moderately good institutions. Countries in the 50–59.9 range are characterized by mostly weak institutions, and countries that score in the range 0–49.9 have the weakest institutions.

the value traded ratio, are highly correlated, the regression results are fairly similar. Model 1 in both tables only show the influence of the control variables on stock market development, where income is positive and significant, inflation is negative and insignificant, and trade openness is positive and significantly associated with stock market development in the baseline model.

The regression results of model 2 provide empirical support for the positive and significant direct effect of formal institutions on stock market development in Hypothesis 1 (ß=2.6989, $p<0.01$ table 3, ß=0.5762, $p<0.01$ table 4). This addition increased the explained variance in the model (ΔR^2=0.1213, $p<0.01$ table 3; ΔR^2=0.1917, $p<0.01$ table 4).

Our second hypothesis argued for a positive relationship between the societal mindset of a population towards capital markets and stock market development. The regression results of model 3 provide empirical support for the positive and significant direct effects of the informal institutional quality on the market capitalization ratio and the value trade ratio, while controlling for other effects (ß=15.1747, $p<0.01$ table 3, ß=1.9466, $p<0.05$ table 4). This addition further increased the explained variance in the model (ΔR^2=0.0489, $p<0.01$ table 3; ΔR^2=0.0252, $p<0.01$ table 4).

Table 3 and 4 are near here

Hypothesis 3 suggests that the relationship between formal institutions and stock market development is dependent on the societal mindset of a population towards capital markets. Therefore, we expect a positive interaction term between formal and informal institutions and the market capitalization ratio/value traded ratio. Model 4 supports our Hypothesis by providing positive and highly significant results (ß=1.6412, $p<0.01$ table 3, ß=0.2211, $p<0.05$ table 4). The addition of the 2-way moderating effect also significantly increased the explained variance (ΔR^2=0.0307, $p<0.01$ table 3; ΔR^2=0.0167, $p<0.01$ table 4).

In Hypothesis 4, we argue that the formal and informal institutional quality have differential effects on stock market development for the Austrian versus the Polish stock market.

In model 5 of table 3 and 4, we found a positive and significant difference in the relation between formal institutional quality and market capitalization divided by GDP (ß=2.8576, p<0.01) and value traded divided by GDP (ß=2.8576, p<0.01). The positive sign of the interaction term indicates an increased importance of formal institutions for Poland, which is in line with our Hypothesis 4a that formal institutions are more important for less developed capital markets. The addition of the interaction term further increased the explained variance (ΔR^2=0.0424, p<0.01 table 3; ΔR^2=0.0380, p<0.01 table 4). In order to validate the moderating effects, we have plotted the interactions in figure 4, where we find that the slope for the curve representing the Polish stock market is steeper than that of the Austrian market.

Finally in Hypothesis 4b, we claimed a higher effect of the societal mindset towards capital markets on stock market development in less developed economies. Unfortunately, we can not support Hypothesis 4b, as the relation is even negative and partially significant (ß=-14.0838, p<0.01 table 3, ß=-1.4436, p>0.10 table 4). Whilet higher levels of the socio-cultural mindset result in increased stock market development for both markets, the effect is more pronounced in the Austrian market.

Figure 4 is near here

4.3 Robustness checks

4.3.1 Estimation methodology

Although we believe that controlling for within and between variation in the standard errors is the more precise methodology, we also run regressions by using a random effects model. Due to the panel nature of the data, inter-temporal correlation among the error terms may create contemporaneous correlation, which violates an important assumption of ordinary least squares regression (**?**). Therefore, we also run a feasible generalized least square model,

which allows us to control for auto-correlation within panels. The results for both models are very similar to the fixed effects model, indicating a lack of auto-correlation.

4.3.2 Stock market development

As an additional robustness test, we examined different further dependent variables and different specifications of the time lag. In that respect, we evaluated how sensitive the regression results are to different assumptions on the lag structure. Results with no time lag, a two period time lag and a four period time lag do not differ significantly from our main results.

In addition to the market capitalization ratio and the value traded ratio, we also calculated results for the turnover ratio. The turnover ratio measures the value of equity trading relative to the market capitalization. High turnover is often used as an indicator of low transactions costs. Importantly, a large stock market is not necessarily a liquid market. A large but inactive market will have a large market capitalization ratio but a small turnover ratio. In contrast to the value traded ratio, capturing trading relative to the size of the economy, the turnover ratio measures trading relative to the size of the stock market. Thus, a small, liquid market will have a high turnover ratio but small value traded ratio (**?**). However, there are hardly any significant results, indicating that companies and investors react very similar to formal and informal institutional quality and, thus, stock exchange liquidity stays more or less unaffected. Only the formal institutional quality appears to be more relevant for investors than for company managers.

4.3.3 Formal institutions

In addition to using the average measure of institutions index, we also employed the sub-institutional Index of Economic Freedom, namely "rule of law", "limited government", "regulatory efficiency" and "open markets", for our robustness checks. The results indicate that "rule of law" and "limited government" are driving our results, whereas "regulatory efficiency"

and "open markets" do not show a significant influence on stock market development.

4.3.4 Informal institutions

As a further robustness test, we examined different settings of our informal institutional variable. In that respect, we evaluated how sensitive the regression results are to different assumptions on the sentiment period. Results for the two year, half-year and current period do not show major changes. We also run our regressions with a different sentiment coefficient, also taking the neutral or ambivalent newspaper articles into account. In that respect, we calculated the following sentiment coefficient:

$$Sentiment\ coefficient\ =\ \frac{(e-c)}{e+c+n}$$

where e is the annual number of favorable articles, c is the annual number of unfavorable articles, and n is the number of neutral or ambivalent articles. Our results are also robust to these model specification.

4.3.5 Control variables

As some country-level variables show significant correlation with one another, we excluded highly correlated control variables from our regressions. In that respect, the Index of Economic Freedom is highly correlated with GDP per capita, which is in line with prior literature arguing that income influences the development of institutional quality (**?**). However, excluding income in the fixed effects regression does not change our findings.

As another robustness test, we add the educational level and internet infrastructure to our models, where our main variables of interest stay very constant. We also added the market indices to our analysis as to distinguish between the price and the quantity effect of the institutional quality on stock market development. Interestingly, we detect a strong price effect in both countries as well as a quantity effect for the market capitalization ratio. This result indicates that the formal and informal institutional quality not only attract potential

investors, but also influence the decision of potentially listed companies.

5 Discussion and Conclusion

5.1 Discussion

Prior evidence has shown that stock market development is crucial to economic development, revitalization, and growth throughout the world (**??**). Using fixed effects panel estimations, we find that both formal and informal institutions matter as determinants of stock market development within and across countries. In contrast to previous research that has focused primarily on differences in formal institutions, we explored how the quality of the entire set of political, legal and economic policies, along with the informal societal dimension of a population's mindset towards capital markets, serve as determinants of stock market development in Austria and Poland.

The empirical results, based on the Index of Economic Freedom of the Heritage Foundation, confirm our hypothesis, that the better the formal institutional quality, the higher the development of national stock markets. Since the analysis was based on the Heritage Foundation index, a more careful insight into the structure of the index might provide an explanation. The index suggests that economies with lower fiscal burden, careful and not too extensive government intervention, sound monetary policy, stable financial markets, stable prices, established property rights and their protection, sound and incorrupt legal system, and little informal market activity are the economies which have better institutional frameworks. Although the requirements of a good institutional framework are open to discussion, prior research has shown that the performance of transition economies confirms the stated relationship (**?**). Nevertheless, our results support our contention that the quality of formal institutions reduces uncertainties for both decision makers, the issuing firms as well as for potential shareholders, and thus improves stock market development.

However, building on arguments that social and cultural factors play a pivotal role in how

individuals and firms engage or disengage in economic transactions (**??**), we found evidence that a population's mindset towards capital markets affect stock market development beyond the influence of formal institutions. Hence, a primary contribution of our study is the examination of the important role that the informal institutional environment has in motivating and/or constraining the level of stock market development.

Furthermore, by including the informal institutions along with the formal ones, a rarity in the literature (**??**), we add to the understanding of the complex interplay between formal and informal institutions. Together they constitute the ''rules of the game'' in a given national context. In that respect, we find that with a higher level of a pro capital market mindset in a country's culture, the positive relationship between the quality of formal institutions and stock market development is strengthened. The results support the notion that informal institutions often ''shape formal institutional outcomes in a less visible way: by creating or strengthening incentives to comply with formal rules'' (**?**). In line with that, we argue that the societal mindset provides a foundation on which a country's formal institutions develop. Over time, the society's norms and values reinforce the formal institutions and enable them to be accepted, supported, and maintained in the society (**?**). Stated differently, our research suggests that a society's mindset towards capital markets influences the continued development and evolution of the country's formal institutions. As a consequence, our findings are in line with the perspective that national institutional elements interact in complex and unique ways to enable and guide patterns of behavior that yield variation in economic outcomes (**??**).

We also contribute to the debate on the determinants of stock market development with the simple idea that the different institutional factors matter for different countries in relation to their economic development. In that respect, the institutions of socialist economies were ruined over night and had to be built up from scratch. The resulting lack of proper institutional quality, combined with differences in the quality of institutional reforms amongst transition economies (**?**), enhanced the volatility for capital market actors. This uncertainty

about the future institutional framework is associated with larger transaction costs and thus being harmful to market participants (**?**). Hence, the importance of institutional aspects are supposed to be even more important for transition economies, facing a historical shift from socialism to capitalism. As expected, our results show that the relation between formal institutions and stock market development is higher for Poland than compared to Austria, indicating an increased importance of political, legal and economic factors in less developed economies.

However, even among developed countries some have more volatile institutions than others. In line with the notion that a more volatile societal mindset enhances uncertainties for issuing firms and potential investors, volatility is proposed to prevent stock market development. As the volatitlity of the societal mindset towards capital markets is even higher in Austria, and in addition less positive, we find a negative moderation effect of the market dummy on the relationship between informal institutional quality and stock market development. This result indicates that establishing a strong capital market mindset is even more important for Austria than it is for Poland. Hence, our findings provide evidence that it is not impossible to establish a free market mindset in transition economies, where Poland seems to be a particularly successful example within the last decade.

5.2 Implications and contribution

Our findings have implications for international business and finance research, where this article has set an agenda for bringing an awareness of formal and informal institutional factors to the understanding of capital markets. By theorizing the institutional environment in which legitimacy occurs, scholars will be better able to understand multiple facets of firm and investor decisions by accounting for some of the societal dynamics that enable or hinder stock market development (**?**). Our study is closely related to existing research (e.g. **??**) that has shown the relation of individual formal institutional factors, like minority shareholder protections, and stock market development. However, only by understanding

the complex interplay between formal institutional quality and social and cultural factors, scholars and managers will be able to understand how capital markets function (**?**). In that respect, previous studies concerning the effect of institutional quality have been ambiguous on this distinction (**?**). Our research setting also enables us to study the different influence of institutions on stock market development within and between a developed and a transition market.

However, our results also have implications for policy makers, investors, and firm decision makers. Policy makers wishing to promote stock market development in their countries may find it worthwhile to strengthen the set of formal institutions that will reduce uncertainty for potential issuers and investors, where the effect differs for developed and less developed economies. For investors, and managers of firms that are not yet publicly traded, our research may be helpful to their respective decision-making processes. By understanding that the acceptability of undertaking and investing in an IPO is affected by both formal rules and informal institutional norms of culture that characterize the institutional environment, both sets of actors (investors and managers of issuing firms) may be able to make better-informed decisions (**?**).

Therefore, the contribution of this research for both managers and scholars is to show that social and cultural structures make an important difference in the development of capital markets and that these environments can be influenced by coalitions of actors interested in either promoting or opposing the legitimation of stock markets.

5.3 Limitations and Future Research

According to the difficult measurement of a population's mindset towards capital markets, our study is limited to two countries. In that respect, we consider Austria as a developed economy and Poland as a transition economy. Although we believe that our implications are transferable to a wider geographic scope, the interpretation of our results has to be taken with caution. In that respect, Poland has already come very close to capitalist economies in many

of the institutional aspects and rely on the use of markets (price liberalization, privatization) for economic coordination (**?**).

We fully rely on macroeconomic data, not taking individual firm or investor perceptions into account. Therefore, we suggest that research providing insights into the perceptions and cognitions associated with decision makers in the listing process, would greatly augment our current understanding of the links between cognitive structures and economic behavior. Indeed, informal and formal institutions influence behavior differently at individual, organizational, and country levels of analysis (**?**).

Although we are heavily convinced of the informal institutional variable we have chosen for this analysis, future research could explore how other societal measures may influence stock market development as well as how they may interact with formal institutions in explaining important financial phenomena. Likewise, we conceptualized formal institutions as a comprehensive set of economic freedom. We believe this combined measure was particularly appropriate for the phenomenon we were examining, since it is more likely to capture the significant effects imparted to both groups of economic actors who matter for stock market development, the managers at the issuing firm and investors (**?**). However, future research could also disaggregate this formal institutional measure to allow a more detailed understanding of the effects of specific formal institutions associated with stock market development.

In addition, a worthwhile question would be whether a certain institutional threshold is a prerequisite in order to begin promoting stock market development. By conducting such an analysis, deeper insights into the pattern of institutions in the light of stock market development may be achieved.

Finally, in line with **?**, generating theoretical frameworks that seek to further reveal the mechanisms associated with the complex inter-dependencies of informal cultural dimensions and formal institutions, and the linkages with economic outcomes at multiple levels of analysis is a fruitful direction for future scholarship.

5.4 Concluding remarks

This study is among the first to examine the concurrent roles of formal and informal cultural institutions in explaining within and between country variation in stock market development. In that respect, stock market development is an integral part of financial development, which is, in turn, associated with economic growth (**?**).

Our results are in line with institutional theorists (**?**) and suggest that high quality formal institutions are considered to be an important facilitator of stock market development. However, we also highlight that the societal mindset towards capital markets is a significant determinant of stock market activity within and across countries and underscores the important role informal institutions play in conjunction with formal institutions. In addition, we could show that the influence of formal and informal institutions on stock market development differs between Austria and Poland. In that respect, processes of catching up with standards and/or wealth levels of developed economies may last much longer than expected, if the fundamentals in question are weak or have to be built up from scratch (**?**). These expectations turned out to be still valid for the formal institutional quality of Poland. However, our results show a more capital market friendly mindset of the Polish population, which is opposite to what we have expected.

In that respect, we conclude that the mindset of a population towards capital markets is one time-varying component of national society, which directly and indirectly, via formal institutional quality, influences stock market development. Furthermore, the influence of these effects depends on the uncertainty that comes along with the different institutional elements. Hence, civil and economic liberties, as well as political ones, are not forever limited to a certain sub-set of countries privileged by history. Our results clearly show that Poland already established a free market economy, with an even higher societal mindset towards capital markets. Nevertheless, lowering taxes, simplifying or eliminating burdensome regulations, reducing corruption and generally minimizing the burden of doing business for economic agents, is still important for stock market development in former communistic countries. Al-

though some decisions may be politically unpopular, nations should promote further reforms desirable for long-term growth (**?**), where efficient institutions are of pre-eminent importance.

References

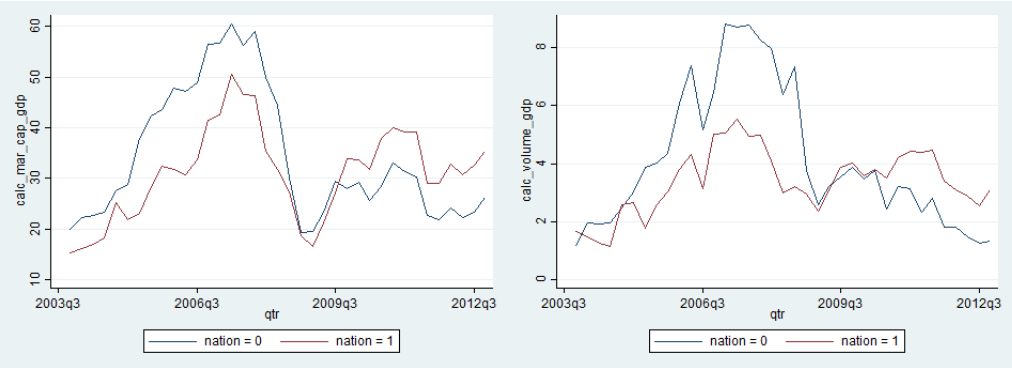

Figure 1: Stock market development in Austria (nation = 0) and Poland (nation = 1) between Q3-2003 and Q4-2012

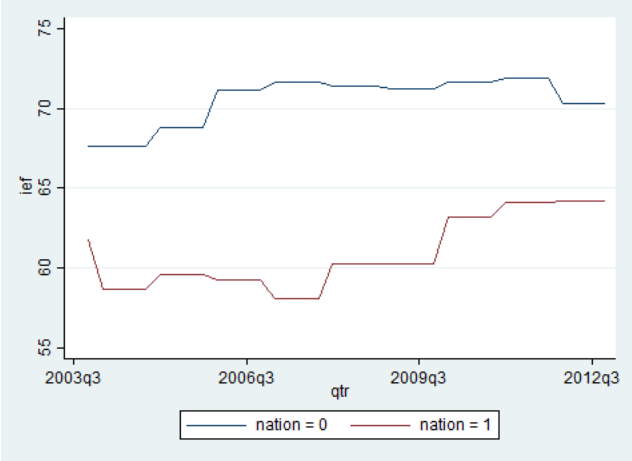

Figure 2: Index of Economic Freedom for Austria (nation = 0) and Poland (nation = 1) between Q3-2003 and Q4-2012

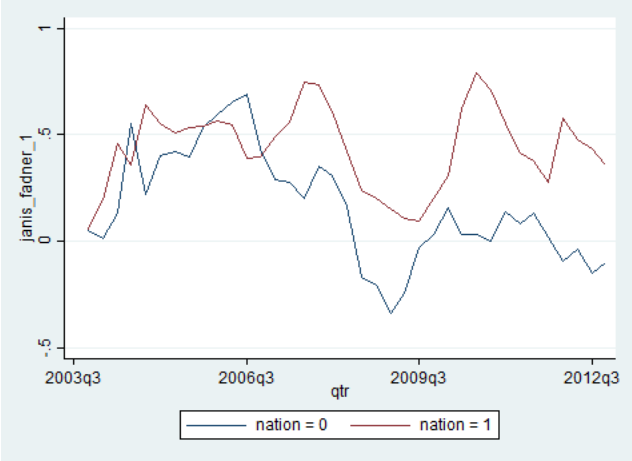

Figure 3: Societal mindset towards capital markets for Austria (nation = 0) and Poland (nation = 1) between Q3-2003 and Q4-2012

Descriptive statistics for regression variables, 2003-2012

	Full sample (n=74)				*Austria (n=37)*				*Poland (n=37)*			
	Mean	*S.D.*	*Min*	*Max*	*Mean*	*S.D.*	*Min*	*Max*	*Mean*	*S.D.*	*Min*	*Max*
Market capitalization ratio[a]	32.86	10.95	16.27	60.54	34.30	12.82	19.36	60.54	31.41	8.62	16.27	50.46
Trading volume ratio[b]	3.76	1.87	1.13	8.82	4.11	2.38	1.26	8.82	3.41	1.08	1.13	5.51
Formal institutions[c]	65.71	5.20	58.10	71.90	70.53	1.47	67.60	71.90	60.89	2.22	58.10	64.20
Informal institutions[d]	0.30	0.27	-0.34	0.79	0.16	0.26	-0.34	0.69	0.44	0.19	0.06	0.79
Income[e]	4.80	2.99	1.50	8.10	7.76	0.28	7.20	8.10	1.84	0.20	1.50	2.10
Inflation[f]	0.66	0.64	-0.64	2.49	0.55	0.50	-0.45	1.97	0.77	0.74	-0.34	2.49
Trade openness[g]	93.50	13.41	67.89	115.69	105.45	5.23	93.97	115.69	81.56	6.62	67.89	91.48

[a] *Market capitalization as a share of GDP.*

[b] *Total value traded as a share of GDP.*

[c] *Formal institutions corresponds to the score of the Heritage Foundation Index, 2014 edition.*

[d] *Informal institutions corresponds to the Janis-Fadner coefficient of coded newspaper articles from Factiva database.*

[e] *Income is real GDP per capita in 2005 EUR billions.*

[f] *Inflation is the change in consumer price index in percent.*

[g] *Trade openness is the value of imports and exports as a share of GDP.*

Table 1: Descriptive statistics for regression variables, Q3-2003- to Q4-2012

Correlation and descriptives (n=74)	1	2	4	5	6	7	8
1 Market capitalization ratio	1						
2 Trading volume ratio	0.8645 ***	1					
4 Formal Institutions	0.1560	0.2251 *	1				
5 Informal Institutions	0.4775 ***	0.3144 ***	-0.5219 ***	1			
6 Income per capita	0.1422	0.2037 *	0.9518 ***	-0.5340 ***	1		
7 Inflation	-0.0394	-0.0432	-0.1497	0.1133	-0.1602	1	
8 Trade Openness	0.2900 **	0.3311 ***	0.9055 ***	-0.3850 ***	0.9182 ***	-0.0898	1
Mean	*32.86*	*3.76*	*65.71*	*0.30*	*4.80*	*0.66*	*93.50*
Standard Deviation	*10.95*	*1.87*	*5.20*	*0.27*	*2.99*	*0.64*	*13.41*

Note: * p<0.10; ** p<0.05; *** p<0.01.

Table 2: Correlation matrix for regression variables, Q3-2003- to Q4-2012

Hierarchical regression results (N=74).

	Market capitalization ratio					
	Model 1	Model 2	Model 4	Model 5	Model 6	Model 7
Control variables						
Income per capita	17.3609 *	-2.5339	6.9985	-0.0420	16.0512 **	0.8250
Inflation	-0.8253	0.4244	-0.4112	-1.3953	-0.0927	-1.3629
Trade openness	1.0200 ***	0.8595 ***	0.7897 ***	0.5658 ***	0.4976 ***	0.6746 ***
Market (Austria vs. Poland)	124.3631 **	28.5704	71.6798	23.3988	-76.6571	36.8381
Time dummies	YES	YES	YES	YES	YES	YES
Independent variables						
H1: Formal institutions		2.6989 ***	1.9101 ***	1.1360 **	-0.3892	1.8183 ***
H2: Informal institutions			15.1747 ***	-97.4242 ***	10.3990 ***	19.0191 ***
2-way interaction terms						
H3: Formal institutions x Informal institutions				1.6412 ***		
H4a: Formal institutions x Market					2.8576 ***	
H4b: Informal institutions x Market						-14.0838 ***
F-ratio	5.68 ***	10.40 ***	15.01 ***	20.6 ***	24.25 ***	17.95 ***
Adjusted R^2	0.7194	0.8407	0.8896	0.9203	0.9320	0.9090
Change in adjusted R^2	0.7194	0.1213	0.0489	0.0307	0.0424	0.0194

Note: * p<0.10; ** p<0.05; *** p<0.01.

Table 3: Fixed-effects regression results on market capitalization ratio

Hierarchical regression results (N=74).

	Value traded ratio					
	Model 1	Model 2	Model 4	Model 5	Model 6	Model 7
Control variables						
Income per capita	6.7231 ***	2.4759 *	3.6987 **	2.7504 **	5.1887 ***	3.0659 **
Inflation	-0.1415	0.1253	0.0181	-0.1145	0.0705	-0.0795
Trade openness	0.1532 **	0.1189 ***	0.1100 ***	0.0798 **	0.0619 *	0.0982 **
Market (Austria vs. Poland)	42.7593 ***	22.3093 ***	27.8395 ***	21.3361 **	3.4249	24.2683 ***
Time dummies	YES	YES	YES	YES	YES	YES
Independent variables						
H1: Formal institutions		0.5762 ***	0.4750 ***	0.3707 ***	0.0965	0.4656 ***
H2: Informal institutions			1.9466 **	-13.2202 *	1.1606 *	2.3407 ***
2-way interaction terms						
H3: Formal institutions x Informal institutions				0.2211 **		
H4a: Formal institutions x Market					0.4703 ***	
H4b: Informal institutions x Market						-1.4436
F-ratio	4.32 ***	10.14 ***	11.87 ***	13.31 ***	16.30 ***	11.95 ***
Adjusted R^2	0.6452	0.8369	0.8621	0.8788	0.9001	0.8658
Change in adjusted R^2	0.6452	0.1917	0.0252	0.0167	0.0380	0.0037

Note: * p<0.10; ** p<0.05; *** p<0.01.

Table 4: Fixed-effects regression results on value traded ratio

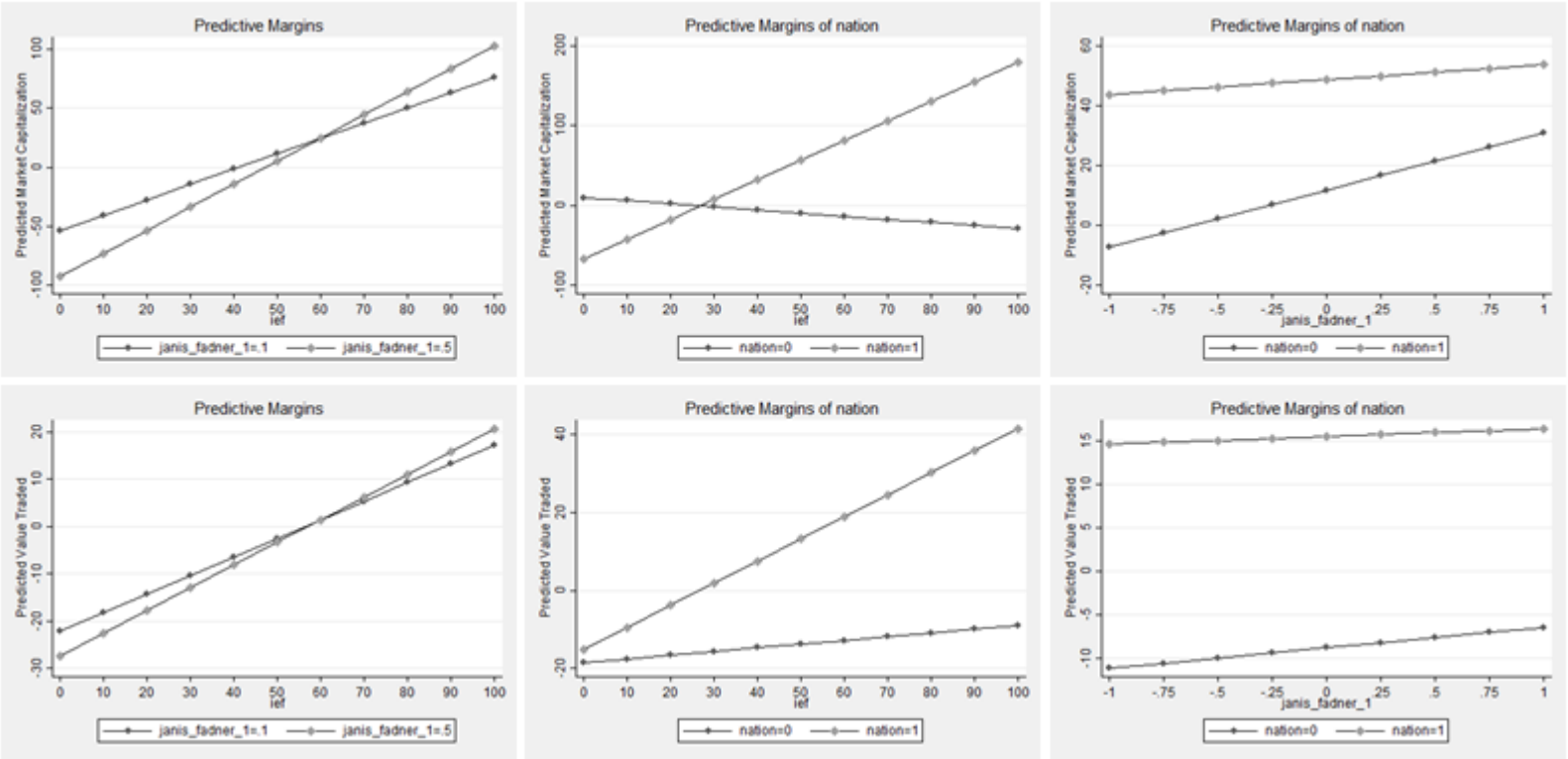

Figure 4: Interaction effects of informal and formal institutions (left), formal institutions and market (middle) and informal institutions and market (right) on stock market development