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The Dark Side of Shareholder Protection: Cross-country Evidence from Innovation Performance

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Abstract - Proponents of minority shareholder protection state that national legal institutions protecting small investors boost stock markets and, in turn, long-term countries' performance. In this paper, we empirically challenge this argument. We perform three-stage least-square estimation on a sample of 48 countries over 1993-2006 and find that countries with stronger shareholder protection tend to have larger market capitalization but also lower innovation activity. We cope with stock market's endogeneity and industry heterogeneity, and circumvent omitted variables bias, so that this finding is unlikely to be driven by misspecification problems. We interpret our estimation results arguing that stronger shareholder protection may depress, rather than encourage, the most valuable corporate productions, because it enables small and diversified shareholders to play opportunistic actions against undiversified stockholders, after specific investments are undertaken by the company; innovation activity, largely based on specific investing, is particularly exposed to this problem.

JEL classification: D23, K22, O31, P12.

Keywords: shareholder protection, innovation, specific investments, inter-shareholder opportunism.

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1. Introduction.

From the early work by Berle and Means (1932), during the all twentieth century, corporate scholars have been worrying about agency problems. An agency relationship is a contract under which a person (the principal) engages another person (the agent) to perform some service on his behalf, delegating some decision-making authority to the agent (Arrow, 1985). If both parties to the relationship are utility-maximizers, the agent is unlikely to act in the interests of the principal. As a consequence, the principal's welfare ends up reduced by an agency cost. The traditional theories of corporate governance maintain that the relationship between the shareholders and the managers of a modern corporation is a pure agency relationship (see, for instance, Alchian and Demsetz, 1972, and Jensen and Meckling, 1976). In particular, where large stockholders dominate shareholders' meetings, small shareholders are exposed to the risk of expropriation, if managers are the expression of the will of the block-holders. From this point of view, national legal institutions constraining the discretion of majority shareholders and providing small or individual shareholders with effective legal means of control – commonly referred to as "investor protection" – should both increase corporations' access to external capital and help corporations and countries enhance their long-term economic performance (La Porta *et al*., 1998, Rajan and Zingales, 1998, Pagano and Volpin, 2005). This view is largely acknowledged also by legal policymakers, as shareholder protection is on the top of the agenda in the United States and in many European countries (see, for example, the EU Directive 2007/36/EC, European Union, 2007).

At the same time, the issue of how institutions of corporate governance affect innovation has become increasingly important (O'Sullivan, 2000, Carpenter *et al*., 2003). On the one hand, the corporate governance system influences the investment decision-makers and shape what type of investments they make, what in turn affects the innovation process. On the other hand, innovation is a strategic instrument for the firms and a source of comparative advantage and of opportunities for future growth; thus, at the macro-level, it is central to the dynamic through which market economies improve their performance relative to each other.

In this paper, we argue that, while minority investor protection may positively affect stock markets, as a large part of the "law and finance" literature states, national institutions of shareholder

protection may also deter the most valuable corporate production strategies and depress innovation performance of countries.

In knowledge intensive economies, a large part of corporate productions is based on specific investments, that lose much of their value-creating potential when switched from a certain use or a certain setting to another. In a context of specific investing, when the production project fails, investors can only partially recoup the value of their investment. As a result, if one of the project participants can credibly threaten the others to dismiss the undertaking in order to extract an additional gain from the relation at their expenses, the remaining investors, anticipating the risk of *ex-post* expropriation, may refrain from investing in the first place (Williamson, 1979). While the risk of opportunistic behavior between firm participants has been largely studied with respect to shareholder-manager and shareholder-worker relations in a traditional hold-up framework (see Gelter, 2009, for a comprehensive picture), proponents of shareholder protection commonly claim that it does not involve inter-shareholder relationships for one main reason. It is assumed that minority shareholders are motivated by a common and benign interest in improving corporate performance, what reduces the risk of opportunistic actions. Yet, the presumption that shareholders share a single economic goal is nowadays inaccurate: individual shareholders often have conflicts of interest with other shareholders arising from other relationships with the firm, from their investments in derivatives or securities of other corporations and from their investments in other parts of the corporation's capital structure (Anabtawi and Stout, 2008). Thus, some of the shareholders may have protective outside options with respect to certain corporate projects, while others do not. Therefore, as one gives to individual shareholders (or shareholder groups) the power to easily oppose the other stockholders and so to influence the outcome of a particular corporate decision, he gives them also the capabilities to put strategic vetoes. The consequence may be inter-shareholder opportunism and *ex-post* rent extraction at the expenses of those who are the most sensitive to the corporate results. If the undiversified controlling shareholders anticipate this risk, they will refrain, in a defensive strategy, from allocating corporate capital to specific (and irreversible) investments. In our opinion, knowledge-intensive productions, aimed at generating innovation, are especially exposed to this problem, given the high specificity of the investments they require (Dosi *et al.*, 1988), so that a

stronger shareholder protection may depress, rather than encourage, the most valuable corporate productions.

Does the empirical evidence support this concern? This paper is aimed at answering this question. In particular, we analyze data on innovation and shareholder protection over 1993-2006 from a sample of 48 countries and find that countries with stronger investor protection (i.e. legal doctrines provide small stockholders with a stronger ability to oppose majority shareholders in the corporate decision-making process) show lower innovation activity, as our theoretical intuition predicts.

Skeptics may rise two arguments against attributing causality.

First, innovation and shareholder protection may be linked through other variables such as the access of corporations in the economy to external capital. Since shareholder protection (in certain models of corporate finance) affects the size of countries' stock market and financial development influences innovation activity, it may not be surprising that shareholder protection and innovation are correlated.

Second, a measure of financial development, if included in a single-equation model, may result correlated with innovation because of reverse causality: the stock market may be partially driven by the corporations' innovation activity, to the extent that shareholders do not wait that the innovation has commercial success and go public to take advantage of the stock market evaluation of the innovation.

In this paper, we cope with these problems by estimating a two-equation system in which the market capitalization is explicitly modeled as an endogenous variable. Moreover, we undertake cross-section regressions along with panel analysis of both total and sector specific countries' innovation, and control for those factors (such as labor market institutions and patent endowment) that are commonly advocated to strongly affect country innovation activity. We also check the robustness of the estimation results to different measures of innovation and shareholder protection and to the presence of unobservable time-invariant country factors. In doing so we are confident in interpreting our findings in a causal sense.

Our paper relates closely to the literature on minority shareholder protection, that has been developed both in the economic and in law debate. Proponents of the so-called "shareholder democracy" establish the desirability of the empowerment of individual (or small) stockholders on

the argument that, if minority shareholder protection sustains larger stock markets (La Porta *et al*., 1998, Pagano and Volpin, 2005) and if more developed financial markets shape corporate performance and economic growth (Rajan and Zingales, 1998), also a positive relationship between minority shareholder protection and long-run economic performance must be true. Specifically, a common assumption in the literature is that controlling shareholders who hold a large fraction of firm's shares prefer lower return projects in order to be exposed to a lower risk, while small investors have a genuine interest in long-term corporate results (see, e.g., Dhillon and Rossetto, 2009). A contrasting body of research strongly challenges this view, suggesting that minority shareholder protection may encourage opportunistic actions played by small activist shareholders. While Gordon (1991) defines shareholders as "multi-principals", more recently Anabtawi (2006), Stout (2007) and Anabtawi and Stout (2008) have explored the potential consequences of strategic interaction between shareholders in a context of heterogeneous interests, and maintained that also minority investors are likely to play rent extraction at the expenses of large shareholders, when they have the ability to affect business decisions in a self-serving way, what in turn may be a restraining factor of specific investing and value-creating productions. This paper provides empirical evidence consistent with such an argument, showing that stronger national legal institutions of minority shareholder protection may favour inter-shareholder opportunism problems in knowledge intensive productions and depress countries' innovation abilities. We depart from the existing empirical literature on shareholder protection in two ways. First, many empirical studies have investigated the potential profitability-enhancing role of shareholder control (see Short, 1994, for a comprehensive survey), but they focus only on the degree of ownership concentration and disregard legal control power of individual or small shareholders, that, instead, is central in our analysis. Second, data on minority shareholder rights have been extensively used to explain the corporate ownership structure and equity market capitalization from a national perspective (for a survey see Denis and McConnell, 2003), but the effect of such rights on long-run country outcomes and innovation has never been explored.

The remainder of the paper is organized as follows. In section 2 we discuss the theoretical motivation for our empirical study. In section 3 we describe the variables that we use in the

estimation. In section 4 we explain our econometric strategy, while the estimation results are presented in section 5. Section 6 concludes.

2. Theoretical motivation

Behind the alleged need of shareholder empowerment, corporate theories generally conflates two different elements: on the one hand, the need of reducing the non-shareholders' capacity to siphon off benefit for themselves, by increasing the shareholder influence on managerial decision-making within managers' legitimate business judgment, and, on the other, the need of shareholder protection against discretional activity by controlling shareholders, what calls for increasing minority shareholder protection and control rights. While the negative consequences of shareholder influence (namely, the hold-up risk for non-shareholder constituencies, especially workers) have been largely explored by corporate governance research (e.g., Gelter, 2009), the dark side of shareholder protection has received little attention, as corporate theories commonly describe minority shareholders as they have a common interest in improving corporate performance. Nevertheless, the long-standing idea that shareholders have homogeneous interests is no longer accurate (Gordon, 1991, Anabtawi, 2006, Stout, 2007, Anabtawi and Stout, 2008). Specifically, a fault line separating shareholders is the extent to which (and how) their portfolios are diversified. Heterogeneity of financial investors is due, for example, to different degrees of risk aversion and to different capabilities to handle complex portfolios. While undiversified stockholders are those who have their wealth disproportionately invested in a given company (e.g. inside shareholders and founding family shareholders), small diversified shareholders, such as mutual funds and hedge funds, are often characterized by their ownership across a wide spectrum of the stock market and so reduce firm-specific risk or even eliminate it under certain circumstances (Gilson and Black, 1993). As a consequence, on the one hand, undiversified shareholders are highly sensitive to corporate outcomes, while, on the other, (extensively) diversified shareholders can become indifferent to the firm's individual shocks. For instance, after an investment project is chosen, a given shareholder may enter into a derivatives contract with an investment bank to hedge away his economic interest in the corporation, in a way such that, if the project fails, the investment bank, and not the hedged

shareholder, will bear the loss. It follows that how shareholders take their decisions about production strategies depends on who the shareholder is.

In the presence of different private interests, an increase of small shareholder control rights may give shareholders the ability to affect the decision-making process in a self-serving way, despite the shareholder voting principle of majority rule. Indeed, when one shareholder can easily threaten a proxy contest and remove directors or bring lawsuits against other stockholders (irrespective of whether they are justified or not), he can also use direct negotiations with the other shareholders to bargain for his private interests. Thus, non-cooperative bargaining between heterogeneous shareholders may occur as the property rights literature predict in other contexts (see, e.g., Hart and Moore, 1990).

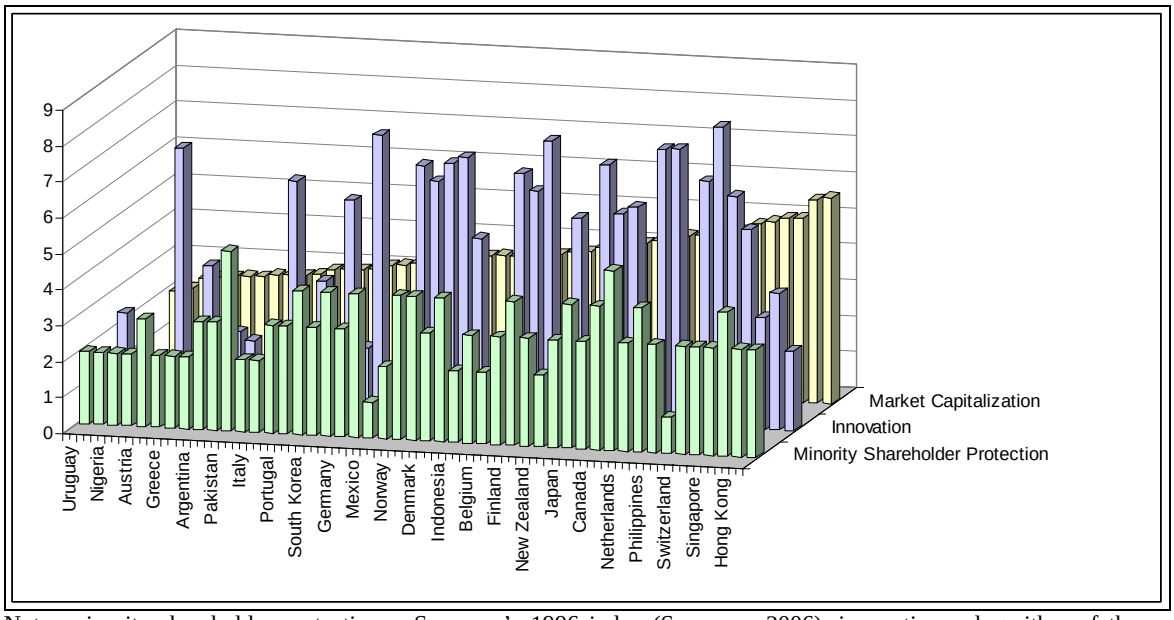
In knowledge intensive productions, a non-cooperative inter-shareholder relationship can easily lead to inter-shareholder opportunism. Innovation processes require specific investments in order to be performed (Dosi *et al.*, 1988), and they lose most of their value when they fall apart before being completed. As a result, when each shareholder, or shareholder group, has a sort of veto power over corporate productions, a given diversified shareholder can also bargain for an undue rent, after the (specific) investment decision is taken, at the expenses of those undiversified shareholders that have all their shares in the individual project or corporation. Consider the following example. An extensively diversified shareholder *A* can credibly threaten an undiversified shareholder *B* to put the veto over an innovative production (after the investment has already been undertaken) and can propose to take a large share of the final outcome (e.g., by diverting the profits into an entity in which *A*'s share is higher), leaving, through a lower shares' value, a final derisory payoff to *B*. If *B* anticipates *A*'s threat, *B* will choose a sub-optimal (non-specific) investment strategy *ex-ante*, which may consist in a short-term non-innovative production with a lower but certain profit. Phrased differently, when a given shareholder's economic interests are not tied-up to an individual corporate project (with a low salvage value) and the shareholder is likely to exercise an *ex-post* strategic veto over it, the benefits that the other shareholders should give him as a "bribe" to let the production end may be too high; so that, if the undiversified shareholders anticipate this risk, they will refuse to undertake the specific investment *ex-ante*, as a defensive strategy.

Many observers direct growing attention to the potential negative effects of inter-shareholder opportunism on value-creating productions as well as to the need for fiduciary duties for small activist shareholders (on this point see Anabtawi and Stout, 2008). For example, Solomon *et al*. (1998), among others, report several cases of conflicts of interest between shareholders that gave rise to opportunistic behavior and in turn distorted corporate investment strategies. This concern is also consistent with the troubling scenario that might arise in consequence of the derivatives revolution and other capital markets developments, as some authors predict. In particular, Hu and Black (2006) remark that the so-called "empty voting" strategies can drive business policies to inefficient investment decisions: if a shareholder has some control power while simultaneously enters into a derivatives contract to hedge away his economic interest, he can also credibly threaten the other stockholders in order to obtain a private gain at their expenses.

It follows that knowledge intensive productions are especially exposed to such a problem, since they are largely based on sunk investments. Specifically, inter-shareholder opportunism may cause a crash in what Carpenter *et al*. (2003) call "strategic control", i.e. the set of relations that gives strategic decision-makers both the incentives and the abilities to allocate firm's resources to innovative investment strategies. Thus, in countries where corporate law ensures strong shareholder protection, innovative productions would be depressed, rather than fostered, if the benefits of a reduction of firm internal agency costs and block-holders' discretion are outweighed by the costs of inter-shareholder opportunistic actions and of incentive distortions in corporate investment decisions. Consider, for instance, United States, United Kingdom and Canada, which are high-income, common law countries with comparable equity markets and financial systems. Consistent with our argument, United States, in which corporate law is shareholder-unfriendly in the aspects relevant here (see Spamann, 2006), show a high level of innovation activity, of about 90 patents per million inhabitants every year. Differently, United Kingdom and Canada, where minority investors are better protected (see, again, Spamann, 2006), show a lower patent activity, around, respectively, 60 and 30 patents per million inhabitants every year. Furthermore, at least from a descriptive point of view, differences in innovation performance between United States, United Kingdom and Canada are unlikely to be driven by differences in labor market institutions and productive structures (United States have a labor market slightly less rigid than that of United Kingdom and Canada and an

industry share of GDP slightly lower). So shareholder protection seems to affect innovation performance of countries in the way predicted. Looking at a larger sample of countries, the relationship between institutions of minority shareholder protection and innovation is more difficult to detect, given the (possibly) counterbalancing effects that shareholder protection institutions may play on innovation activity both directly and indirectly through financial markets, as Figure 1 shows. We explore this relationship more systematically in the rest of the paper.

Figure 1. Shareholder protection, innovation and market capitalization (48 countries).



Note: minority shareholder protection = Spamann's 1996 index (Spamann, 2006), innovation = logarithm of the number of patents of 1997-2006 period weighted by the country's population, market capitalization = logarithm of the 1996 market capitalization as % of country's GDP.

3. Data

In order to perform the empirical analysis, we collect a novel dataset in which we link information on legal shareholder protection to the aggregated innovation performance of corporations using data from various sources over the 1993-2006 period. Specifically, we are aimed at studying the effect of legal shareholder control on innovation activity at the country level, controlling for the market capitalization and other factors, the market capitalization being considered as an endogenous variable. So, as a first step, we define appropriate indicators for both innovation performance and shareholder protection at the country level (sub-section 3.1 and sub-section 3.2). Then, we choose the control variables (sub-section 3.3).

3.1. Innovation activity.

Dealing with innovation in econometric estimation can be problematic.

A first problem involves the measure of innovation. Generally, two indicators are used to measure innovative activity: an input measure, R&D spending (see, for example, Lanjouw and Schankerman, 2004), and an output measure, the number of patents (e.g., Bound *et al*., 1984). Both these indicators have some disadvantages. On the one hand, R&D spending is an imperfect proxy for innovation activity, since not all innovations are generated within formal R&D programs; on the other, the number of patents does not capture those innovations that are protected by trade secrets. In our estimation, we consider both the aggregated number of patents awarded by the corporations of a given country and the R&D spending of the private sector (as a % of GDP) as indexes of innovation performance. In particular, for the number of patents we use data from the European Patent Office (2008), for R&D spending we consider data from the World Development Indicators' database (World Bank, 2008).

A second problem concerns the time horizon within which to consider countries' innovation activity. While the R&D spending should be immediately affected by investment decisions, innovation programs take time to get to a patent, so that to consider the number of patents awarded within one year after the investment decision is limitating. For example, Ho *et al*. (2006) report that the average duration of innovation projects is between five and ten years. In our empirical analysis, we use data for periods of five and ten years between 1993 and 2006. Notice that unreported estimation results, obtained using shorter periods, lead to substantially similar conclusions.

Using the number of patents causes a third problem, related to inter-country comparisons. To weight the number of patents by GDP seems an obvious strategy in order to make country data validly comparable. However, a two-way relation between number of patents and GDP may generate estimation bias. We weight the country's total amount of patents both by its population and its GDP in different model specifications, in order to check the robustness of the estimation results (for GDP and population, we use data from the World Development Indicators' database, World Bank, 2008).

3.2. Shareholder protection.

La Porta *et al*. (1998) develop the so-called "anti-director rights index" that is routinely used as a measure of (small or individual) shareholder protection in cross-country quantitative studies (see, among others, Pagano and Volpin, 2005, and the revised index by Djankov *et al*., 2008). This index measures "how strongly the legal system favors minority shareholders against managers or dominant shareholders in corporate decision-making process" (La Porta *et al*., 1998, p. 1127) and assesses the minority shareholder ability to elect and remove directors. The shareholder protection index, originally compiled by La Porta *et al*. (1998) for 1996, has been extended by Pagano and Volpin (2005) to the entire interval between 1993 and 2002. This is the variable that we use as an indicator of legal shareholder protection. The shareholder anti-director rights index that we consider is formed by adding 1 when the country allows shareholders to mail their proxy vote to the firm, shareholders are not required to deposit their shares prior to the general shareholders' meeting, cumulative voting or proportional representation of minorities in the board of directors is allowed, an oppressed minorities mechanism is in place, the minimum percentage of share capital that entitles a shareholder to call for an extraordinary shareholders' meeting is less than or equal to the sample median (10%), or shareholders have preemptive rights that can be waived only by a shareholders' vote. The final index ranges from zero to six. Furthermore, we perform a robustness check in which we use the revised index by Spamann (2006), which employs the same variable definition of Pagano and Volpin (2005) but proposes a different coding, as we will further discuss in the next section.

3.3. Control variables.

As a first control we use the logarithm of countries' market capitalization. Market capitalization is the share price times the number of shares outstanding, as % of GDP (the source of data is World Bank, 2008). Several studies emphasize that, when corporations face internal financing constraints, new equity has some advantages over debt for financing high-tech investments: equity finance does not require the corporation to post collateral, investors' upside returns are not bounded, and additional equity financing does not increase the probability of financial distress. For example,

Bradley *et al*. (1984) and Long and Malitz (1985) show empirically that there is a negative relationship between a firm's leverage and its intangible assets, and Carpenter and Petersen (2002) find that countries with relatively well developed markets for new equity have a comparative advantage in the production of high-tech goods.

As a second control, we consider an index of worker participation to allow for firm internal commitments between employees and employer and for specific human capital development (we define worker participation as the employee participation to the management decision-making and use data collected from International Labour Organization, 2007, and Kluge and Stollt, 2006; in accordance with its qualitative nature, the variable is coded as "high" in the case of widespread participation rights, "medium" in the case of limited participation rights, and "low" when participation rights are absent or very limited). Michie and Sheehan (1999), for example, show that the employee participation is positively correlated with the likelihood of firms innovating. We also substitute the worker participation rights index with an indicator of the degree of employment protection in one model specification, in order to check the robustness of the results to measurement errors. In particular, where this substitution is made, we use an overall summary indicator of employment protection provided by OECD (2009), that is calculated as a weighted sum of 12 sub-indicators relating to regular contracts.

Third, we include the country's industry share as % of GDP from the World Development Indicators (World Bank, 2008). In particular, the industry share is divided in three classes in order to minimize problems due to influential outliers ("low" if the industry share is lower than 25%, "medium" if it is between 25% and 50%, "high" if it is greater than 50%).

Fourth, we consider the weighted number of patents awarded by the corporations of a given country in the year preceding the considered period. In this way, also the autoregressive component of patents data is explicitly modeled in our analysis and estimated. As Pagano and Rossi (2004) argue, given technological interdependencies in knowledge intensive productions, countries with higher endowments of patents tend to acquire further innovation abilities, while other countries may be trapped in equilibria where they do not acquire intellectual assets because they do not have innovation abilities and they do not acquire the abilities because they do not have intellectual assets.

Finally, as we have mentioned above, the market capitalization must be modelled as an endogenous variable, since a set of shareholder protection rights may be one of the determinants of the breadth of equity markets. In the absence of minority shareholder protection, potential block-holders may expropriate small stockholders, so that the latter anticipate lower returns and are unwilling to buy shares in the first place (La Porta *et al*., 1998, Pagano and Volpin, 2005, Djankov *et al*., 2008). In particular, in our model, the market capitalization is allowed to react to the shareholder protection index, the worker participation rights to the corporate decision-making (as suggested by Roe, 2003; the definition of this variable is the same of that used as an explanatory variable for innovation),[2] the GDP per capita expressed in purchasing-power-parity, the rule of law and the government independence. The rule of law and the government's independence measure, respectively, the quality of contract enforcement, property rights and courts, and the degree of government's independence from political pressure (source: World Bank, 2009). Again, we employ a further model specification where the worker participation rights index is substituted with the employment protection index by OECD (2009).

4. Econometric strategy

The estimation's objective is to estimate the effect of an increase of legal shareholder protection on innovation activity (measured either by number of patents or R&D spending), also controlling for a vector of covariates. We start performing panel estimation. This allows us to tackle possible misspecification problems and omitted variable bias, since it enables us to take advantage of the intertemporal variability of the observed information set.

As we have mentioned in the previous section, countries' innovation activity and legal shareholder protection may be linked in a similar pattern through their relation with a common variable (namely, the market capitalization), what may cause a spurious relationship. In order to address this problem, we explicitly model the market capitalization. We consider the following cross-country two-equation model:

[2] Roe (2003) argues that, in some countries, firm's founders seek to preserve concentrated ownership because of strong employees rights, so that the two institutions of worker participation and block ownership may be linked in a power counterbalancing dynamics.

$$Inn_{i\Delta t} = \alpha + \beta \cdot ShPr_{it} + \boldsymbol{\gamma} \cdot \boldsymbol{\Phi}_{it}(+c_i) + \varepsilon_{it} \quad (1)$$

$$MkCap_{it} = \delta + \eta \cdot ShPr_{it} + \boldsymbol{\theta} \cdot \boldsymbol{\Omega}_{it}(+c_i) + \upsilon_{it} \quad (2)$$

Symbols have the following meaning: $Inn_{i\Delta t}$ measures innovation activity of country i in a five-year interval Δt, $ShPr_{it}$ is the shareholder protection index for country i at date t, $MkCap_{it}$ is the logarithm of market capitalization, $\boldsymbol{\Phi}_{it}$ and $\boldsymbol{\Omega}_{it}$ are two vectors of controls, c_i is a time constant variable that captures the effect of unobserved countries' heterogeneity; α, β, $\boldsymbol{\gamma}$, δ, η, and $\boldsymbol{\theta}$ define the parametric structure (in particular α and δ are the two model constants, and $\boldsymbol{\gamma}$ and $\boldsymbol{\theta}$ are the vectors of the controls' parameters), while ε_{it} and υ_{it} are the error terms. The vector $\boldsymbol{\Phi}_{it}$ contains $MkCap_{it}$, $WorkPart_{it}$ (worker participation), $EmPr_{it}$ (employment protection), Ind_{it} (industry share) and Pat_{it} (number of patents previously awarded); the vector $\boldsymbol{\Omega}_{it}$ includes Gdp_{it} (GDP per capita), $Rule_{it}$ (rule of law), Gov_{it} (government's independence), $WorkPart_{it}$ and $EmPr_{it}$. Variables' descriptions are given in the previous section, while descriptive statistics are collected in Table 1. Notice that, when we use the number of patents as an index of innovation activity, $Inn_{i\Delta t}$ is calculated over intervals of five years; while, when we use R&D spending as an index of innovation, the dependent variable is Inn_{it}, which denotes the R&D spending at date t. The base sample that we use is the largest possible given the data availability (48 countries).[3] Given that we employ panel data on shareholder protection for the 1993-2002 period, we should be able to exploit 480 observations. However, some year data are missing for Iceland, Ireland, Israel and Uruguay, so that we use 476 observations in some panel model specifications. It follows that our panel of data is an "unbalanced panel" since we observe a different number of observations for different countries. Moreover, we can consider only OECD countries when we use the employment protection index ($EmPr_{it}$) and data for some years are missing for some OECD countries, as a consequence the sample size is reduced to 139 observations in one panel model specification.

[3] Argentina, Australia, Austria, Belgium, Brazil, Canada, Chile, Colombia, Denmark, Ecuador, Egypt, Finland, France, Germany, Greece, Hong Kong, India, Indonesia, Ireland, Israel, Italy, Japan, Jordan, Kenya, Malaysia, Mexico, Netherlands, New Zealand, Nigeria, Norway, Pakistan, Peru, Philippines, Portugal, Singapore, South Africa, South Korea, Spain, Sri Lanka, Sweden, Switzerland, Thailand, Turkey, United Kingdom, United States, Uruguay, Venezuela, Zimbabwe.

Table 1. Descriptive statistics (cross-country data, all industries).

	CROSS-SECTION SAMPLE		PANEL SAMPLE	
VARIABLE	MEAN	STD. DEV.	MEAN	STD.DEV.
Inn (patents, weight: pop. in millions) †	503.466	839.986	259.461	442.671
Inn (patents, weight: GDP in billions of US $)	--	--	11.131	16.643
Inn (R&D, % GDP)	1.289	0.995	1.346	1.065
ShPr ‡	2.979	0.923	3.310	1.224
WorkPart (low = 0, medium = 1, high = 2)	0.469	0.738	0.469	0.732
EmPr	--	--	2.154	0.871
MkCap	3.627	0.995	3.688	1.056
Pat (weight: pop. in millions)	35.872	61.335	45.043	79.458
Pat (weight: GDP in billions of US $)	--	--	1.880	2.907
Ind (low = 0, medium = 1, high = 2)	1.980	0.468	1.947	0.480
Gdp	12408	10934	12480	1100
Gov	0.914	1.094	1.056	1.064
Rule	0.697	0.995	0.702	0.998

† *Inn* is calculated over five-year intervals in the panel sample, while over a ten-year interval in the cross-section sample. ‡ *ShPr*: default rules in panel data, mandatory rules in cross-section data.

Notice that, in our operative model, we meet identification requirements by using two excluded instruments in equation (2), namely an indicator of the rule of law and the government's independence index. As suggested by La Porta *et al*. (1997) the character of legal rules and the quality of law enforcement have large effects on the breadth of capital markets across countries, while they do not show a statistically significant correlation with innovation. So, there is no more than one structure that can lead to the same reduced form, therefore we can estimate the structure.

As equations (1) and (2) show, we allow innovation activity to react to shareholder protection rights and market capitalization and, simultaneously, market capitalization to react to the shareholder protection. Consequently, ε_{it} is likely to be correlated with $MkCap_{it}$. Thus, we jointly estimate the two equations using a three-stage least square procedure (3SLS hereafter). The three steps in the 3SLS method are the following. The first step is identical to the first step of a two-stage procedure (2SLS): the predicted values of each endogenous variable on all the exogenous regressors are obtained. In the second step, we substitute the predictions of the market capitalization found in the first step in place of $MkCap_{it}$ on the right hand side of equation (1) and apply OLS, the residuals are then used to obtain an estimate of the covariance matrix of the error terms of the two equations. In the third step, the estimate of the cross-equation correlation matrix is used as a weighting matrix to

calculate the generalized least square estimator (GLS). The last two steps are iterated over the estimated disturbance covariance and parameter estimates until the parameter estimates converge.

5. Estimation results

5.1. Basic regressions.

Table 2. Cross-country estimation results: basic regressions (3SLS, all industries).

	(1) PANEL		(2) PANEL		(3) PANEL	
VARIABLE	*INN as: Patents - weight: pop. -*		*INN as: Patents - weight: GDP -*		*INN as: R&D (% GDP)*	
Eq. 1. Innovation	**Coef.**	**(Std.Err.)**	**Coef.**	**(Std.Err.)**	**Coef.**	**(Std.Err.)**
ShPr †	-20.801	(7.368) ***	-0.842	(0.302) ***	-0.300	(0.112) ***
MkCap	49.907	(16.286) ***	2.086	(0.690) ***	2.114	(0.398) ***
WorkPart (low)	benchmark		benchmark		--	--
WorkPart (medium)	37.837	(17.051) **	1.544	(0.681) **	--	--
WorkPart (high)	98.997	(22.316) ***	4.813	(1.001) ***	--	--
EmPr	--	--	--	--	0.251	(0.155)
Ind (low)	benchmark		benchmark		--	--
Ind (medium)	14.009	(16.329)	0.705	(0.652)	--	--
Ind (high)	66.126	(35.916) *	3.831	(1.472) ***	--	--
Pat	4.813	(0.141) ***	4.769	(0.173) ***	--	--
Constant	-107.053	(46.199) ***	-4.438	(1.909) **	-6.490	(1.688) ***
Eq. 2. Market Cap.	**Coef.**	**(Std.Err.)**	**Coef.**	**(Std.Err.)**	**Coef.**	**(Std.Err.)**
ShPr †	0.174	(0.034) ***	0.175	(0.034) ***	0.105	(0.045) **
WorkPart (low)	benchmark		benchmark		--	--
WorkPart (medium)	-0.289	(0.114) **	-0.278	(0.114) **	--	--
WorkPart (high)	-0.597	(0.145) ***	-0.584	(0.145) ***	--	--
EmPr	--	--	--	--	-0.105	(0.063) *
Gdp	0.001	(0.000) ***	0.001	(0.000) **	0.001	(0.000) ***
Rule	0.467	(0.069) ***	0.490	(0.069) ***	--	--
Gov	--	--	--	--	0.196	(0.091) **
Constant	2.690	(0.127) ***	2.698	(0.127) ***	3.140	(0.266) ***
STATISTICAL DETAILS:						
Number of obs.	476		476		139	
Wald test - eq. (1): *p*-value	0.000		0.000		0.000	
Wald test - eq. (2): *p*-value	0.000		0.000		0.000	
I stage fit [*R*-square]	0.375		0.374		0.307	
Sargan test [H_0, at 1%]	accepted		accepted		accepted	

Note: "*" = 10% significance, "**" = 5% significance, "***" = 1% significance. † $ShPr_{it}$: default rules.

Table 2 reports the estimation results of the basic panel model specifications. The two-equation parameters, simultaneously estimated, are reported one after the other. While the left column reports the variables, the remaining columns report the estimated parameters of the various model specifications. Specifically, models (1), (2) and (3) are panel model specifications in which innovation activity is measured by, respectively, the number of patents of a five-year period weighted by the country's population, the number of patents of a five-year period weighted by the country's GDP and the R&D spending of a given year as a % of the country's GDP, so as to check the robustness of the results to different measures of innovation.

The parameter estimates are broadly stable across the various model specifications and provide strong support to our theoretical argument of a negative effect of shareholder protection on knowledge intensive productions. In particular, we find that an increase of the shareholder protection index (*ShPr*) has a negative and statistically significant effect on innovation activity of countries (*Inn*), also controlling for a potential spurious relationship through the market capitalization. This is shown by all the considered model specifications. Although we cannot observe directly how investment decisions within corporations vary across countries along with different levels of shareholder protection, we interpret this result as a signal for the presence of inter-shareholder opportunism when heterogeneous shareholders can easily affect business decisions in those productions that require specific investments, such as innovation activities. Indeed, it is true that shareholder empowerment might reduce corporate innovation also by means of a reduction in the incentives for other stakeholders (primarily workers) to undertake firm specific investing, according to a traditional hold-up scheme. Nevertheless, in our estimation we use a shareholder protection index that specifically measures minority shareholders' intervention power, while the risk of hold-up of workers by shareholders as a class is captured by the worker participation and employment protection indicators.

Further interesting results are obtained. First, shareholder protection, as suggested by La Porta *et al*. (1998), may positively affect the market capitalization (*MkCap*); the market capitalization results to be also negatively affected by the worker participation rights (*WorkPart*) and the employment protection legislation (*EmPr*), consistently with the argument by Roe (2003), and it is linked with the GDP per capita (*Gdp*), rule of law (*Rule*) and government's independence (*Gov*) by a positive

relation. Second, worker participation rights have a positive and statistically significant effect on innovation activity (when the latter is measured by the number of patents). This finding may support the idea that worker participation and legal protection motivate employees to apply their skills and effort to collective learning processes, enhancing the corporate knowledge base and innovation activity (Michie and Sheehan, 1999). However, to the extent that workers may play rent-seeking actions, the positive effect of worker participation on innovation activity is partially compensated by its negative effect on the incentives of financial investors to contribute their money to the corporation, what is shown by the negative sign of the parameters associated to *WorkPart* and *EmPr* in equation (2). Third, the number of patents previously awarded by the corporations of a given country (*Pat*) is statistically relevant in explaining the amount of its subsequent innovations, what highlights the cumulative nature of technological innovation in knowledge intensive productions. The industry share (*Ind*) turns out statistically significant only when greater than 50%.

Finally, we perform a diagnostic analysis of our results. First, we have checked relevance and exogeneity of the instruments used in the estimation. In order to test the relevance condition, as recommended by Bound *et al*. (1995), we have examined the first stage *R*-square, which, in our model specifications, is greater than 0.3, that is the commonly used rule of thumb (Shea, 1997). In order to test the exogeneity condition, we have implemented the Sargan test for overidentifying restrictions. The test results lead us not to reject the null hypothesis (at the 1% level of statistical significance) of uncorrelation of the instrumental variables to some set of residuals, thus the instruments are statistically validated. Second, as an overall diagnostic procedure, we have performed the Wald test on all the model specifications; the test results lead us to reject the null hypothesis of joint non statistical significance of all the parameters. Statistical details are reported at the bottom of Table 2.[4]

[4] Notice that OLS estimation results of equation (1) also show a negative partial effect of shareholder protection on country-level innovation activity. These estimation results are not reported but are provided by the author upon request.

5.2. Robustness checks.

Even if the results presented in the previous sub-section are shown to be robust to different measures of innovation, two further arguments may be offered against attributing economic meaning to our findings.

First, it may be argued that the indicator of minority shareholder protection by Pagano and Volpin (2005) is inaccurate (see, for example, Enriques, 2002). As Spamann (2006) points out, the most basic issue for coding of legal variables like the shareholder rights index is whether only mandatory rules, default rules, or optional rules should be counted. While Djankov *et al*. (2008) explicitly coded for default rules, La Porta *et al*. (1998) and Pagano and Volpin (2005) did not take an explicit position, although they seem to have been primarily concerned with default rules. To use default or optional rules in our analysis may not allow us to validly compare shareholder protection across countries. Indeed, the default and optional rules' substantive content does not matter very much in the presence of low transaction costs (this is nothing more than a relatively straightforward application of the Coase Theorem, Coase, 1960), which in turn substantially vary across countries depending on the efficiency of the legal systems.

Second, one may object that the informal character of shareholder activism entails that shareholders can operate outside the limits of shareholder power defined by national regulation (Brav *et al*, 2008). In some countries, like United States, small investors can easily circumvent the existing legal devices regulating shareholder voice and engage private negotiations with boards, in turn affecting corporations' investments and performance. As a result, an index measuring national legal rules of minority shareholder protection may not capture all the ways through which small investors can influence corporate production strategies and innovation.

In order to check the robustness of our estimation results to the first point, we perform two cross-section model specifications counting only mandatory rules in the shareholder protection indicator. In this case, we use the revised index by Spamann (2006), which uses the original variable definition from La Porta *et al*. (1998) and allows us to distinguish mandatory rules from default and optional rules. The revised index by Spamann (2006) refers to 1996 only. In the first cross-section model specification, we measure innovation activity by the number of patents over a ten-year interval and

exploit a sample of 46 observations; in the second one, we use R&D spending as an indicator of innovation activity and are forced to consider only 33 observations because of some missing data. We include a further control variable in these two model specifications, namely a measure of the country trade openness (*Openness*), calculated as the sum of merchandise exports and imports divided by the value of GDP (source: World Bank, 2008).

With respect to the second point, we undertake a panel model specification in which we include 48 country-dummies. So doing, we explicitly estimate country fixed effects capturing the influence of those unobservable factors that affect shareholder activism and, through this, corporations' innovation at an aggregated level as well as the role played by potential country level time-invariant omitted variables.[5]

Results of these robustness checks are reported in Table 3. Models (1) and (2) are cross-section specifications in which minority shareholder rights are measured by means of the Spamann (2006)'s index and where a reduced number of controls is included in order to save the number of degrees of freedom; model (3) is a panel model in which country fixed effects are estimated (in Table 3 they are not reported for reasons of space), while the shareholder protection index by Pagano and Volpin (2005) is used. Notice also that, while in model specifications (1) and (3) reported in Table 3 we use a weighted number of patents as an indicator of innovation, R&D spending is used in model specification (2).

Our main result is shown to be robust both to a different measure of minority shareholder protection and to the presence of unobservable factors affecting innovation directly or indirectly through, for example, informal shareholder activism. As can be seen in Table 3, we find that an index of minority shareholder protection has a negative and statistically significant effect on innovation in all the three model specifications considered.

Interestingly, (unreported) estimated country fixed effects (obtained by including 47 country-dummies in the panel model specification (3), the US dummy being excluded) show that Germany's unobserved factors have a positive effect on innovation. Indeed, being the United States the benchmark, the estimated parameter for Germany is shown to be positive and statistically significant

[5] For instance, countries that tend to exhibit a concentrated corporate ownership structure may show, keeping other factors constant, a lower level of innovative investment projects, to the extent that a reduction of managerial discretion by large outside shareholders is detrimental to firm-specific investments (see, e.g., Burkart *et al.*, 1997).

at the 1% level, what is consistent with the argument that some unobserved factors characterizing the United States in comparison with Germany, such as a larger informal shareholder activism, may have a negative effect on innovation.

Table 3. Cross-country estimation results: robustness checks (3SLS, all industries).

	(1) CROSS-SECTION		(2) CROSS-SECTION		(3) PANEL - FIXED EFFECTS ‡	
VARIABLE	*INN as: Patents - weight: pop. -*		*INN as: R&D (% GDP)*		*INN as: Patents - weight: pop. -*	
Eq. 1. Innovation	**Coef.**	**(Std.Err.)**	**Coef.**	**(Std.Err.)**	**Coef.**	**(Std.Err.)**
ShPr †	-195.053	(116.124) *	-0.291	(0.151) *	-128.117	(31.477) ***
MkCap	469.649	(179.681) ***	0.768	(0.181) ***	575.083	(111.222) ***
WorkPart (low)	benchmark		benchmark		benchmark	
WorkPart (medium)	843.924	(244.382) ***	0.958	(0.308) ***	-330.722	(115.319) ***
WorkPart (high)	1549.657	(257.349) ***	1.307	(0.335) ***	467.670	(142.032) ***
Ind (low)	benchmark		benchmark		benchmark	
Ind (medium)	61.489	(324.743)	-0.360	(0.413)	27.001	(31.114)
Ind (high)	582.937	(654.226)	1.194	(0.571) **	12.600	(53.075)
Pat	--	--	--	--	1.661	(0.444) ***
Openness	-2.002	(2.380)	-0.003	(0.001) *	--	--
Constant	-927.862	(520.382) *	-0.554	(0.688)	-1780.01	(433.631) ***
Eq. 2. Market Cap.	**Coef.**	**(Std.Err.)**	**Coef.**	**(Std.Err.)**	**Coef.**	**(Std.Err.)**
ShPr †	0.291	(0.113) ***	0.357	(0.151) **	0.184	(0.043) ***
WorkPart (low)	benchmark		benchmark		benchmark	
WorkPart (medium)	-0.703	(0.304) **	-0.867	(0.351) **	-0.894	(0.226) ***
WorkPart (high)	-1.164	(0.356) ***	-1.378	(0.413) ***	-1.853	(0.230) ***
Gdp	-0.000	(0.000)	0.001	(0.000) *	0.001	(0.000) ***
Rule	--	--	--	--	0.266	(0.065) ***
Gov	0.836	(0.196) ***	0.602	(0.227) ***	--	--
Constant	2.464	(0.365) ***	1.800	(0.461) ***	2.859	(0.259) ***
STATISTICAL DETAILS:						
Number of obs.	46		33		476	
Wald test - eq. (1): *p*-value	0.000		0.000		0.000	
Wald test - eq. (2): *p*-value	0.000		0.000		0.000	
I stage fit [*R*-square]	0.499		0.496		0.877	
Sargan test [H_0, at 1%]	accepted		accepted		accepted	

Note: "*" = 10% significance, "**" = 5% significance, "***" = 1% significance. † $ShPr_{it}$: default rules (in panel estimation), mandatory rules (in cross-section estimation). ‡ Country fixed effects not reported.

We also find, in model specification (1), that the degree of the country trade openness (*Openness*) does not affect the country-level production of patents in a statistical significant way, while results of the model specification (2) show that the trade openness has a negative effect on the country R&D

spending at the 10% level of statistical significance, what is consistent with previous findings (Furman *et al.*, 2002).

Finally, these estimation results are validated by the diagnostic analysis, whose statistical details are reported at the bottom of Table 3.

5.3. Industry heterogeneity.

We also explore how the relation between countries' innovation and national legal institutions of shareholder protection varies across industries. Indeed, some industries are relatively more in need of external finance, as suggested by Rajan and Zingales (1998). For instance, telecommunications and information technology productions are shown to be more dependent on external financing, while process engineering (e.g., food processing, paper and materials processing) less. This implies that, *ceteris paribus*, the stock market development should have a greater influence on innovation activity in an industry such as electrical engineering than in process or mechanical engineering, which requires little external finance. In turn, this may affect the intensity of the marginal effect of the institutions of shareholder protection on countries' innovation performance, to the extent that "finance-hungry" industries are more opened to small stockholders' equity investments. In order to explore this heterogeneity dimension and to provide more precise estimation results, we perform industry-specific versions of the model. Specifically, we group patent data according to the 5-industry ISI-INIPI-OST Classification System as follows: (*i*) electrical engineering and information and telecommunications technology, (*ii*) optics, instruments and medical technology, (*iii*) chemistry and pharmaceuticals, (*iv*) paper and printing, material processing, metallurgy and process engineering, and (*v*) transport and mechanical engineering. Results of this further method are reported in Table 4. The left column reports the variables, while the remaining columns report the estimated parameters of industry-specific models. In all the model specifications reported from column (1) to column (5) of Table 4, innovation activity is measured by the number of patents of a five-year period weighted by the country's population, while we use the shareholder protection index from Pagano and Volpin (2005).

Table 4. Cross-country estimation results: industry heterogeneity (3SLS, industry-specific models).

	(1) PANEL electrical engineering	(2) PANEL instruments engineering	(3) PANEL chemistry and pharma.	(4) PANEL process engineering	(5) PANEL mechanical engineering
VARIABLE	*INN as: Patents - weight: pop. -*	*INN as: Patents - weight: pop. -*	*INN as: Patents - weight: pop. -*	*INN as: Patents - weight: pop. -*	*INN as: Patents - weight: pop. -*
Eq. 1. Innovation	**Coef. (Std.Err.)**	**Coef. (Std.Err.)**	**Coef. (Std.Err.)**	**Coef. (Std.Err.)**	**Coef. (Std.Err.)**
ShPr †	-4.854	-4.063	-3.406	-2.872	-3.543
	(2.851) *	(1.461) ***	(1.248) ***	(1.120) ***	(1.259) ***
MkCap	17.186	8.680	7.622	5.831	6.514
	(5.949) ***	(3.188) ***	(2.676) ***	(2.240) **	(2.639) **
WorkPart (low)	benchmark	benchmark	benchmark	benchmark	benchmark
WorkPart (medium)	18.622	7.678	2.623	3.722	3.168
	(7.151) ***	(3.492) **	(2.747)	(2.589)	(2.918)
WorkPart (high)	70.988	10.956	7.373	4.446	8.356
	(9.391) ***	(4.225) ***	(3.313) *	(3.216)	(3.697) **
Ind (low)	benchmark	benchmark	benchmark	benchmark	benchmark
Ind (medium)	-0.740	2.511	3.717	2.517	4.415
	(7.187)	(3.383)	(2.661)	(2.488)	(2.802)
Ind (high)	19.929	16.528	12.545	8.071	7.285
	(15.626)	(7.530) **	(5.816) *	(5.436)	(6.084)
Pat	4.289	5.169	4.736	5.181	4.941
	(0.179) ***	(0.132) ***	(0.123) ***	(0.104) ***	(0.089) ***
Constant	-39.548	-17.871	-16.727	-11.781	-12.995
	(18.098) **	(9.288) *	(7.405) **	(6.887) *	(7.571) *
Eq. 2. Market Cap.	**Coef. (Std.Err.)**	**Coef. (Std.Err.)**	**Coef. (Std.Err.)**	**Coef. (Std.Err.)**	**Coef. (Std.Err.)**
ShPr †	0.173	0.173	0.174	0.174	0.174
	(0.034) ***	(0.034) ***	(0.034) ***	(0.034) ***	(0.034) ***
WorkPart (low)	benchmark	benchmark	benchmark	benchmark	benchmark
WorkPart (medium)	-0.290	-0.290	-0.290	-0.289	-0.287
	(0.115) **	(0.114) **	(0.114) *	(0.114) **	(0.114) **
WorkPart (high)	-0.598	-0.599	-0.598	-0.597	-0.595
	(0.145) ***	(0.145) ***	(0.145) ***	(0.145) ***	(0.145) ***
Gdp	0.001	0.001	0.001	0.001	0.001
	(0.000) ***	(0.000) ***	(0.000) ***	(0.000) ***	(0.000) ***
Rule	0.467	0.465	0.466	0.468	0.472
	(0.070) ***	(0.069) ***	(0.069) ***	(0.069) ***	(0.069) ***
Constant	2.690	2.689	2.206	2.690	2.692
	(0.127) ***	(0.127) ***	(0.135) ***	(0.127) ***	(0.127) ***

Note: "*" = 10% significance, "**" = 5% significance, "***" = 1% significance. † $ShPr_{it}$: default rules.

When the estimation is performed on industry-specific samples, our main conclusion does not change, as the estimated coefficient relating the shareholder protection index remains negative and

statistically significant at the 1% level across sectors. In addition, industry specific regressions reveal that the effect of the market capitalization on innovation activity is higher in those sectors that rely relatively more on external funding (such as electrical engineering), what in turn is related to a stronger negative effect of the minority shareholder protection institutions. At the opposite, an industry such as process engineering, which is relatively less dependent on external finance, shows a weaker link between stock markets, investor protection and innovation.

Again, we are induced by the diagnostic analysis to never reject the statistical validity of our estimation results. See Table 5 for details.

Table 5. Diagnostics: industry-specific models.

STATISTICAL DETAILS:	**(1)** **PANEL** electrical engineering	**(2)** **PANEL** instruments engineering	**(3)** **PANEL** chemistry and pharma.	**(4)** **PANEL** process engineering	**(5)** **PANEL** mechanical engineering
Number of obs.	476	476	476	476	476
Wald test - eq. (1): *p*-v.	0.000	0.000	0.000	0.000	0.000
Wald test - eq. (2): *p*-v.	0.000	0.000	0.000	0.000	0.000
I stage fit [*R*-square]	0.375	0.375	0.375	0.375	0.375
Sargan test [H_0, at 1%]	accepted	accepted	accepted	accepted	accepted

6. Concluding remarks

Most of the "law and finance" literature argues that national legal rules protecting small investors positively affect long-run performance of countries, by boosting the stock markets. In this paper, we have empirically challenged this argument, by focusing, in particular, on country innovation performance, which is central to the long-term development of market economies. We have performed panel and cross-section estimation using data over the 1993-2006 period and found that countries with stronger shareholder protection show larger market capitalization but also lower innovation activity, after controlling for those variables that are commonly advocated to strongly affect country innovation performance.

We have interpreted this result as follows. It is true that the risk of expropriation at the expenses of individual stockholders is likely to occur as a consequence of block-holder discretion where corporate law is weak in providing small investors with formal legal means of control. However, an

increased minority shareholder protection may merely replace one set of problems with another. Indeed, nothing ensures that the small shareholders will not use their increased power to siphon off benefits for themselves. Minority shareholders, such as hedge funds and mutual funds, often hold pools of assets across a wide variety of investment strategies in different corporations and are less likely to take interest in long-term corporate results than those who have their wealth disproportionately invested in a given company. Knowledge intensive productions, in particular, may result negatively affected by strong minority shareholder protection, since the high specificity of the investments necessary to innovative activities exposes undiversified shareholders to opportunistic actions of small and (extensively) diversified stockholders, causing *ex-ante* incentive distortion in corporate investment strategies.

Moreover, we have showed that our estimation results are unlikely to be driven by omitted variables bias or misspecification problems, since we cope with endogeneity of the market capitalization and industry heterogeneity and check the robustness of the results to possible measurement errors and omitted variables.

In our opinion, this paper's findings may bear on two different areas of the current research. First, they suggest that the benign effect of a stronger shareholder protection traditionally advocated by the "law and finance" literature might need to be reconsidered, at least partly. Second, in the context of the literature on innovation, this paper provides some evidence that innovation is not simply a consequence of profit maximizing behavior of firms, rather it is institutionally embedded, and that a system of corporate governance may be an important factor shaping innovation abilities of corporations and countries. Finally, our findings have straightforward implications on legally policy matters, as they may advise legal policymakers to take into account that small shareholders may use increased voice opportunity for private gain-seeking.

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