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Rainer Fehn
Carsten-Patrick Meier

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Center for Economic Studies & Ifo Institute for Economic Research
Poschingerstr. 5, 81679 Munich, Germany

Tel.: +49 (89) 9224-1410
Fax: +49 (89) 9224-1409
e-mail: office@CESifo.de



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Abstract

This paper presents a positive model which shows that institutional setups on capital and labor markets might be intertwined by politicoeconomic forces. Some countries especially in continental Europe exhibit a corporatist politicoeconomic equilibrium with a substantial protection of insiders on both markets. The more important money is in political decision-making, the more divided the workforce is, and the more globalized capital markets are, the more likely is a capitalist politicoeconomic equilibrium with little employment and substantial investor protection. Our prediction of a negative cross-country relationship between labor market rigidities and of competition on capital markets receives considerable empirical support.

JEL Classification: G34, K22, K42

Keywords: Labor markets, employment protection, corporatism, corporate governance, shareholder protection, political economy.

Rainer Fehn
Economics Department
University of Würzburg
Sanderring 2
97070 Würzburg
Germany
rainer.fehn@mail.uni-
wuerzburg.de

Carsten-Patrick Meier
Kiel Institute of World
Economics
24100 Kiel
Germany
carsten.meier@ifw.uni-
kiel.de

I. Introduction*

While mass unemployment continues to be high up on the agenda for economic policy in most continental European countries, structural reforms of the labor market prove to be notoriously difficult to implement. Labor market deregulation hurts entrenched insiders, i.e., those holding regular jobs, at least in the short to medium run which makes them opposed to such an undertaking.¹ It follows that as long as insiders are the majority in a democratic society such a supply-side approach to the labor market is hardly politically feasible. Still, countries such as the U.S., Great Britain, and New Zealand show that a more competitive labor market may be a feasible institutional setting under certain country-specific circumstances.

Strikingly, implementing and/or sustaining competition on the labor market appears to be mainly a viable option in Anglo-Saxon countries. Yet, these countries also have quite a different institutional setup on the capital market. The latter one is stock market based, ownership of public firms is dispersed with institutional investors such as pension funds playing an important role and there is a vibrant venture capital market. Managers' policies are relatively tightly aligned with shareholders' interests through their income depending greatly on stock market performance and by the threat of hostile takeovers. In continental Europe, in contrast, capital markets tend to be still dominated by large banks, which entertain close relationships with large firms not least via extensive cross shareholdings. Corporate governance largely rests with these banks via proxy voting, blockholding of shares is widespread, but management has nonetheless a lot more room for discretionary maneuver, inter alia due to opaque accounting rules. Stakeholder interests appear to matter more in the decisions of management in continental Europe compared to Anglo-Saxon countries. Furthermore, Anglo-Saxon capital markets accord in general a substantially larger degree of effective legal protection to providers of capital while in continental Europe protection of capital market "insiders" (management and entrepreneurs) is higher.²

The present paper is related to a recent line of research that stresses the importance of complementarities in labor market reforms.³ It argues that the institutional setups on labor and capital markets are intertwined by politicoeconomic forces. Preferential treatment of insiders on labor and capital markets might be part of an encompassing politicoeconomic deal to shut out competition on both markets. It comes at the expense of shareholders, and insofar as it leads to larger unemployment, the unemployed outsiders as well as current and future tax payers are negatively affected. This line of

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¹ The appropriation model of Caballero and Hammour (1998) along with recent empirical evidence in favor of a long-run elasticity of substitution between capital and labor which exceeds the threshold value of one (Berthold, Fehn, and Thode, 2000) show, however, that insiders themselves might benefit from a deregulated labor market in terms of wages and employment opportunities in the long run.

² See La Porta et al. (1997), (1998), (1999a), and (1999b).

³ See e.g. Coe and Snower (1997), and Saint-Paul (1998a).

reasoning has not received much attention in the literature so far but is the emphasis of a recent seminal paper by Pagano and Volpin (2001). They derive within the framework of a rigorous analytical model the theoretical result that there should be multiple politicoeconomic equilibria concerning employment and investor protection and, more concretely, a negative relationship across countries concerning these two institutional variables. Hence, there should be clusters of countries, with the corporatist cluster of countries exhibiting high employment and low investor protection and with the capitalist cluster having the opposite features. The feasibility of the corporatist setup is greater if the political system is conducive to the formation of coalition governments as is the case with proportional representation. They find substantial empirical evidence for their theoretical model especially based on bivariate regressions across OECD countries relating employee protection both to shareholder protection and to mergers and acquisitions. Furthermore, coalition governments are empirically indeed more prevalent in corporatist than in capitalist countries and they also present empirical evidence for their proposition that there should be a positive cross-country relationship between the diffusion of equity ownership and the degree of investor protection as well as a negative cross-country relationship between the diffusion of equity ownership and the degree of employee protection.

Our model is mainly a simplified version of the Pagano and Volpin (2001) setup. However, since it differs in some of the assumptions made, it allows an easier derivation of essentially the same theoretical result, namely a negative relationship between the degree of corporatism on labor markets and the degree of capitalism on capital markets across countries. Furthermore, our empirical tests are more encompassing as they involve a larger number of indicators for assessing the institutional setting on the labor and the capital market. To this end, the paper is organized as follows. Section II presents a positive model which produces two politicoeconomic equilibria concerning employment and investor protection. Section III delivers a cross-country empirical analysis of the model. Section IV provides conclusions.

II. A positive model relating employment to investor protection

1. Structure of the model

In the following, a simple politicoeconomic model relating employment to investor protection is presented.⁴ The purpose of the model is to show that there are multiple distinct types of politicoeconomic equilibria that can be expected to arise. This first section derives the preferences of private agents concerning employment and investor protection. The ensuing second section discusses

⁴ The basic structure of the model is the same as in Pagano and Volpin (2001). However, our analysis differs in some respects. First, we assume that workers who are laid off have to be paid by law a certain amount of firing costs, and not that labor law restricts the fraction of the workforce of each firm which can be laid off. Second, we distinguish between capable entrepreneurs who can master the new technology and those who are not able to do so. Third, this enables us to account for workers and entrepreneurs in the sense that our results are not based on the arrival of new agents but are rather obtained with the set of agents existing at the outset. Fourth, due to our different set of assumptions we arrive at a simpler graphical solution of the model.

how these preferences lead to different politicoeconomic equilibria in a political system with a selfish representative government which wants to be reelected but also needs financial donations from affiliated interest groups in order to finance campaigns. There are three types of private agents in this model: workers W , entrepreneurs E , and investors I . Total initial endowment of each group with wealth is A_W , A_E , and A_I respectively, and wealth is evenly distributed among the members of each group. Furthermore, workers have a unit endowment of labor time per period, and the human capital of entrepreneurs is indispensable for setting up and running firms.⁵ Hence, the total number of firms in the economy is equal to the available number of entrepreneurs m . Each firm is assumed to require n workers to operate, so that the total number of workers amounts to $N = nm$. Each firm furthermore needs k units of capital, with $k > A_E / m$, so that entrepreneurs need external financing. The policy space consists of two issues, protection of workers against dismissal via firing costs f , and of the degree I to which shareholders as investors are protected by law and its enforcement against ex post appropriation by entrepreneurs and possibly also workers. Such antidirector rights consist inter alia of the legal system's protection of minority shareholders against managers and dominant shareholders and include the regulations on voting rights attached to shares, rights that support the voting mechanism against interference by insiders, and rights to call extraordinary shareholder meetings. Both, f and I , are normalized to values between zero and one.

As in Pagano and Volpin (2001), the timing of events is assumed to be as follows (figure 1). Time runs from $t = -1$ to $t = 3$, so that there are five time periods to consider. In $t = -1$, entrepreneurs found firms by hiring n workers and by acquiring k units of capital. They devote all their personal assets to their own firm and raise the remaining capital by selling risky equity stakes of their newly founded firms. The percentage stakes of risky shares, that entrepreneurs, investors, and workers hold of each firm, are called b_E , b_I , and b_W respectively. The supply of share capital is assumed to be perfectly elastic and there is an excess supply of share capital, i.e., total supply of share capital by investors and workers always exceeds demand by entrepreneurs. Investors and workers can also buy riskless bonds which yield a return that is for simplicity normalized to zero.

- Figure 1 about here -

All agents are assumed to be risk neutral. Investors and workers are only willing to hold shares if they at least break even in expectation. Hence, their expected respective share of future dividends must at least be as large as their initial capital input. The size of the dividends paid out to shareholders in $t = 3$ is given by the respective ownership stake of the firm times the value V of the cash flows of each firm paid by entrepreneurs to all shareholders including themselves net of the amount D that they diverted from the firm previous to paying out shareholders. Entrepreneurs thereby obtain an extra private benefit B . The size of these private benefits and therefore also of V are endogenous, because they depend on the extent to which the legal regime prevents entrepreneurs from diverting money into their own pockets via

⁵ Entrepreneurs are in principle identical to managers because the human capital of both is usually necessary for running a firm and because managers usually also hold nowadays shares of their firm. However, a difference stems from the fact that entrepreneurs and not managers found new firms.

investor protection I and on firing costs f . Legislation on employment and investor protection is passed in $t = 0$. Investor protection boils down to shareholder protection as there is assumed to be no agency or risk problem concerning bonds.

Production takes place in two production life cycles which start in periods -1 and 2, and end in periods 1 and 3. The first production cycle is extremely simple. Entrepreneurs initially hire workers with a contract for the first production cycle which ends in $t = 1$. Hence, in $t = 1$ initial output is produced and initial wages w are paid. The representative firm's output in the first production cycle is $Y_1 = yn$, with y being the initial productivity of each worker.

Labor contracts can be renegotiated in $t = 2$, when a shock in form of a technological innovation is assumed to hit the economy. The advent of computers to this hypothetical country could be such an innovation shock. This shock makes the fraction x of all workers potentially more productive by a margin Δ , while the productivity of the remaining $1 - x$ workers remains the same if their firms are not reorganized. Furthermore, to make the model symmetric the same fraction x of all entrepreneurs is capable of mastering the management problem of not only identifying those workers who have become more productive, but of also actually making use of their higher productivity. The identity of these ex post capable workers and entrepreneurs is ex ante unknown. These capable entrepreneurs can use their edge concerning the new technology to increase their profits by substituting less productive workers with workers whose productivity has been boosted by the innovation shock. Hence, xm entrepreneurs have an incentive to restructure their firms, which are denoted as good firms, whereas incompetent entrepreneurs run bad firms. Each competent entrepreneur wants to lay off $(1 - x)n$ low-productivity workers, so that the total number of workers who are about to be laid off is $(1 - x)n xm$. The good firm has to pay to each of them a firing cost of f due to the legislation passed in $t = 0$.⁶

High-productivity workers who find themselves in bad firms with incompetent entrepreneurs want to leave these bad firms and join good firms. There are $(1 - x)m$ such bad firms and each of them has xn capable workers who want to leave. Hence, the total amount of workers who voluntarily quit bad firms amounts to $(1 - x)n xm$, and is thus exactly equal to the number of workers laid off in the good firms. Assuming for simplicity zero mobility costs for all workers, good workers leave bad firms if the wage which good firms offer them exceeds their wage in the bad firms. This is indeed the case if due to competitive pressure good firms cannot practice wage discrimination, i.e., they have to pay the same wage to all their high-productivity workers. In order to prevent high-productivity workers from mimicking that they are low-productivity workers, good firms have to raise their wages in $t = 2$ at least by the amount f . It is assumed that competitive pressure is high enough on the labor market so that $w + f$ is indeed the wage paid to all high-productivity workers who end up working for good firms. Hence, assuming that workers laid off by good firms are rehired by bad firms at the standard wage w , they in fact end up having the same income during the second production cycle as high-productivity

⁶ It should be kept in mind that employment per firm is limited to n .

workers. In contrast, the $(1-x)^2 nm$ low-productivity workers, who worked from the start for firms, which turned out to be bad ones, only earn w in the second production cycle.

As competition on the labor market forces good firms to pay all high-productivity workers a wage of $w+f$ and have to pay f to each bad worker laid off, substituting good for bad workers is only profitable for good firms if the boost in productivity of good workers is assumed to be large enough so that $\Delta > 2f$ holds. This is henceforth assumed to be the case. Profits of good and bad firms, $\mathbf{p}_{2i}, i = g, b$, in the second production cycle amount to:

$$\mathbf{p}_{2g} = n(y + \Delta) - (1-x)nf - n(w + f), \quad (1)$$

$$\mathbf{p}_{2b} = ny - nw. \quad (2)$$

Profits of bad firms in the second production cycle are of course equal to profits of all firms in the first production cycle. Furthermore, profits of good firms obviously exceed profits of bad firms due to our assumption that $\Delta > 2f$ holds.⁷

This allows us to calculate total firm values $V_i, i = g, b$ of good and bad firms in $t = -1$, which are the sum of profits in both production cycles minus diversion D by entrepreneurs:⁸

$$V_g = n(2y + \Delta) - (1-x)nf - n(2w + f) - D(\mathbf{I}), \quad (3)$$

$$V_b = 2n(y - w) - D(\mathbf{I}). \quad (4)$$

The unconditional expected value V of a firm in $t = -1$ is finally equal to:

$$V = xV_g + (1-x)V_b. \quad (5)$$

Hence, legislation in $t = 0$ concerning the level of investor protection and the level of firing costs affect V as intuitively expected in a positive and negative way respectively:

$$\frac{\partial V}{\partial \mathbf{I}} = -x \frac{\partial D}{\partial \mathbf{I}} - (1-x) \frac{\partial D}{\partial \mathbf{I}} = -\frac{\partial D}{\partial \mathbf{I}} > 0, \quad (6)$$

$$\frac{\partial V}{\partial f} = x[-(1-x)n - n] = -xn(2-x) < 0. \quad (7)$$

However, as in Pagano and Volpin (2001) the value of the representative firm depends on diversion D by the entrepreneur prior to paying out dividends. Hence, D is an endogenous variable, and before it is possible to proceed it should be pointed out how D depends on \mathbf{I} and \mathbf{b}_E . It is straightforward to show that the intuitive result obtains under our set of assumptions concerning B , namely that the optimal level of diversion by entrepreneurs D depends negatively on both, investor protection \mathbf{I} and the size of

⁷ In fact, $\mathbf{p}_{2g} > \mathbf{p}_{2b}$ already holds for $\Delta > f(2-x)$.

⁸ The discount rate is for simplicity assumed to be zero.

their own shareholdings of the firm b_E . Greater investor protection increases not only the likelihood of detecting a diversion of funds by entrepreneurs but also raises the severeness of the associated punishment thus deterring entrepreneurs from misbehaving in such a way. Furthermore, the greater are their own shareholdings, the smaller is the incentive of entrepreneurs to cheat. In the limit, if they financed their firms completely themselves, they would simply redistribute funds from their right to their left pocket but lose some of the money and break the law along the way.

Based on the assumption that all three types of agents, investors, workers and entrepreneurs maximize their expected income in $t = 3$, it is straightforward to analytically derive how their utility depends on the two policy parameters I and f .⁹ Investors dislike firing costs and have a preference for higher investor protection, hence $U_I = U_I(\bar{I}, \bar{f})$. Firing costs reduce the value of firms (equation 7) and thus also the total amount of dividends that can be paid out to investors. The better is the legal protection of investors, the less diversion of profits by entrepreneurs takes place and the higher is again ceteris paribus the total amount of dividends that is paid out to investors. Hence, indifference curves of investors are positively sloped and of concave shape in the (I, f) -plane. Given that I and f are normalized to lie between zero and one, their bliss point BP-I in the (I, f) -plane in figure 2 is $(1,0)$.

Workers like investor protection assuming that they hold at least some shares. Concerning firing costs the result is a priori ambiguous because higher firing costs increase their expected income from being workers but they reduce their expected income as shareholders. Assuming realistically that the former effect dominates the latter, both, firing costs and investor protection are goods from the perspective of workers: $U_W = U_W(\bar{I}, \bar{f})$. Their indifference curves are then downward sloped and convex in the (I, f) -plane. The bliss point of workers BP-W therefore is $(1,1)$. Finally, entrepreneurs clearly dislike both, firing costs and investor protection: $U_E = U_E(\bar{I}, \bar{f})$. Their indifference curves are downward sloped and concave in the (I, f) -plane. Hence, their bliss point BP-E is $(0,0)$.

- Figure 2 about here -

The three contract curves connect the two bliss points involved in any particular contract curve. The contract curve between entrepreneurs and investors CC-EI is therefore the horizontal section on the I - axis connecting the bliss point for entrepreneurs $(0,0)$ and the one for investors $(1,0)$. In contrast, the contract curve between investors and workers CC-WI is the vertical line connecting the bliss point of investors $(1,0)$ and the one for workers $(1,1)$. Finally, the contract curve between entrepreneurs and workers CC-WE is upward-sloped and cuts through the square connecting bliss points of entrepreneurs $(0,0)$ and workers $(1,1)$. CC-WE is given by the connection of all points where the indifference curves of workers and entrepreneurs, IDC-W and IDC-E, are tangent to each other. It is for simplicity drawn as a straight line but this need not be the case.

⁹ See the appendix for explicit derivations of the slope and the shape of the indifference curves of the three actors in the (I, f) -plane.

2. Multiple politicoeconomic equilibria

We are now ready to turn to the question of which politicoeconomic equilibria arise from this setup. Voting takes place in $t = 0$. Starting with the counterfactual, if there were no self-interested government, but rather pure direct democracy, along with straightforward sequential voting on both issues, employment and investor protection, as well as perfect information of voters, then the outcome would simply depend on the relative size of the three interest groups. Workers are usually not only by far the largest group of people but they might even constitute the absolute majority. Hence, under direct democracy and perfectly informed voters a politicoeconomic solution concerning employment and investor protection would most likely be chosen that coincides with their bliss point BP-W (1,1) in the (I, f) -plane or is at least close to it.¹⁰

However, this is certainly not the typical case for political decision making in OECD countries. It is much more realistic to assume indirect, representative democracy with a selfish government which wants to be reelected. Yet, in order to be reelected such a selfish government along with the opposition parties need money in order finance their campaigns. Such campaign donations are essential for influencing undecided or less well informed voters so that they cast their vote in favor of the respective party. Voters are not perfectly informed about all political issues but can rather be influenced via campaigns on at least some of them while they might be ideologically predisposed on other issues. The political decisions of selfish governments therefore not only depend on the number of people which belong to certain interest groups whose votes might be attracted by political decisions favoring them, but also on the capability of such interest groups to finance electoral campaigns. This money is essential for swaying undecided or less well informed voters to cast their vote in favor of the party concerned. Hence, political decisions by governments depend on both, the number of votes an interest group represents, and its ability to raise funds for financing campaigns. Different relative strengths of both effects give rise to multiple politicoeconomic equilibria. The more votes an interest group represents and the more money it can raise, the more likely it is that the political decisions of a government reflects its preferences (Grossman and Helpman, 1994).

It is therefore evident why workers are usually not able to call the shots on their own in political decision-making in highly developed countries even though they might constitute the absolute majority. First, since per capita wealth of entrepreneurs and investors is higher than that of workers, their disadvantage stemming from absolute group size is reduced in indirect representative democracies via this channel. Second, as indirect rather than direct democracy prevails in most highly developed countries, issues are not decided separately but explicit or implicit package deals rather prevail, thus lobbying and deal-making play a key role in political decisions.

¹⁰ Such a counterfactual politicoeconomic equilibrium with workers essentially being able to decide on institutions unilaterally leading to very high firing costs and close to no effective legal protection of investors might be dubbed a “socialist” regime.

To adapt the model accordingly, it is now assumed that the self-interested representative government is elected in $t = 0$ and that it passes legislation on employment and investor protection in the same time period. The political decision by the government depends on the preferences of the interest groups which support it by votes and/or by donating money. It is assumed that in order to be elected any government needs the support directly via votes and/or indirectly via campaign contributions of at least two out of the three interest groups workers, entrepreneurs, and investors. The political decision of any newly elected government concerning employment and investor protection then hinges on the coalition of interest groups which it represents and on their relative weight in the political considerations of that government. The optimal solution from the point of view of the newly elected government lies on the contract curve of the two interest groups involved with the precise position depending on their relative bargaining power.

For several reasons, the natural coalition of interest groups appears to be the one between entrepreneurs and workers. First, investors are compared to entrepreneurs and workers a more heterogeneous group of people with diverse interests and with a considerable free rider problem. Similar to consumers, it is more difficult for investors to organize and to form a powerful lobby than it is for entrepreneurs and workers since each investor usually has rather little at stake. This is in particular the case in countries, where the distribution of wealth is relatively egalitarian. The more equal the wealth distribution in a country is, the greater is the number of people involved in holding shares and the smaller is each one's interest in a good protection of shareholders. Second, a coalition between workers and entrepreneurs also seems natural in light of the fact that both groups share a common interest in keeping the threat of hostile takeovers low, in maintaining control of the firm, and in lobbying for a less competitive goods market so that they can share the arising monopoly rents.¹¹ Therefore, in a bargaining environment with coalitions of interest groups being crucial for the institutional outcome, it is likely that entrepreneurs and workers determine the institutional setup on labor and capital markets while investors are kept out of coalitions. A point on the contract curve CC-WE will be realized, which will be the closer to workers' bliss point $(1,1)$, the greater is their relative bargaining power. However, as both groups, entrepreneurs and workers usually command over substantial bargaining power in advanced OECD countries and especially in continental European countries, the solution is to be expected somewhere in between. We will henceforth denote such a situation with a medium level of employment and investor protection as a corporatist setting.¹²

¹¹ See Hellwig (2000). This is of course also due to the fact that politicians tend to align with locally concentrated stakeholders rather than with dispersed shareholders.

¹² Traditional definitions of corporatism (e.g., Bruno and Sachs (1985), Newell and Symons (1987), and Calmfors and Driffill (1988)) emphasize its consensus-oriented approach toward political decision making and refer mainly to the institutional setting on the labor market (especially centralized wage bargaining) and to the existence of an elaborate welfare state. This coincides with our definition in the way that corporatist regimes relative to capitalist regimes put less emphasis on market forces and more emphasis on regulating economic relationships via institutions which are influenced also by political considerations and not only by efficiency considerations. Our definition is more encompassing, though, as we follow, e.g., Roe (1999) and Pagano and Volpin (2001) in also including the institutional setup on capital markets in the definition of corporatism according to the same basic principle "political interference with market forces". It is throughout the literature recognized that corporatist regimes are related to social democratic

Another, though less likely politicoeconomic equilibrium is a capitalist setting with a coalition between entrepreneurs and investors, which lies to the southeast of the corporatist solution involving greater investor protection and less employment protection.¹³ As entrepreneurs and investors have higher per capita wealth, their influence on political decision-making increases with the overall importance of private money in the election system and so does the likelihood of a capitalist solution. Money is particularly important in politics if a substantial part of the electorate is either not well informed about political issues or is not ideologically predisposed in favor of a certain political party. Elaborate and costly campaigns are in both cases suitable instruments to sway voters to cast their votes according to financiers' preferences. Moreover, the role of money can be enhanced by the voting system. It can be expected to be greater in majority vote systems which favor the survival of two large umbrella parties that render ideological predispositions less important in voting. In addition, political candidates in such a system depend more directly on donations for financing their campaigns as they cannot simply get into parliament by being high up on the party list. Yet, those external financiers can relatively easily keep track of their voting behavior and hold them accountable for it. The outcome of general elections in majority vote systems also tends to depend on certain key states where it is especially effective for external financiers to concentrate their lobbying activities. Finally, primaries prior to general elections are an additional factor which raise the costs of running for office thus increasing the influence of external financiers.

Another factor that increases the chance of a capitalist coalition is dividedness and heterogeneity of workers which tends to be reflected in a low bargaining power of unions. Clearly, if part of the workers act more like capitalists commanding over substantial amounts of human capital and of stocks or stock options, they will be reluctant to join forces with ordinary workers to lobby for higher employment protection. Such human capitalists tend to have a low probability of being laid off and of ending up in long-term unemployment so that their interest in lobbying for legal employment protection is rather limited.¹⁴ An education system which fosters an unequal distribution of human capital and which does a relatively poor job in providing everybody with the general skills necessary for participating successfully in a modern work environment is therefore conducive to the capitalist setup because it tends to divide workers.¹⁵

parties being in government. This point is emphasized in Roe's (1999) discussion of corporatist regimes on capital and labor markets. He points out that countries with strong social democratic traditions want to tame market forces in order to subdue income variability across people and over time because they crave for greater stability. Countries with strong social democratic traditions furthermore place larger emphasis on equality relative to economic efficiency and it is apparent that ideological convictions in continental European and especially Scandinavian countries are much more rooted in social democracy and thus in corporatism compared to say the U.S.

¹³ As investors substitute workers in the political decision-making process, the capitalist equilibrium must differ from the corporatist equilibrium in the (I, f) -plane in such a way that workers are worse off whereas investors are better off, and entrepreneurs are at least indifferent.

¹⁴ They might in fact favor lower employment protection because this reduces possible negative repercussions on them if firms are prevented from reacting swiftly to adverse shocks by adjusting its staff of ordinary workers.

¹⁵ A more unequal wealth distribution works in the same direction because it raises the stakes of investors in lobbying for higher investor protection. A further potentially important factor in dividing workers are racial conflicts.

A third factor is related to the globalization of capital markets. In a closed economy, essentially only entrepreneurs have an exit option by not realizing their entrepreneurial ideas and by becoming workers, too. This is probably the main reason why the third possible coalition between workers and investors is not viable as it would be directed against the interests of entrepreneurs who constitute an elastic production factor even in a closed economy. Global capital markets give such an exit option also to investors, thus reducing the feasibility of the corporatist setting which does not explicitly take the interests of investors into account. Hence, global capital markets make workers the only inelastic production factor thus reducing their influence on political decisions.

Summing up, the model suggests that the institutional settings of the labor market on the one hand and the capital market on the other hand are related.¹⁶ Countries that grant workers a relatively high amount of employment protection are likely to give little protection to investors, and vice versa. Thus, while each country's choice of its institutional framework depends on a number of electoral, socio-demographic and economic details, we expect there to be a negative relationship between investor and employment protection across countries. It is this empirical question we turn to next.

III. A cross-country empirical analysis

Empirically, both employment protection and investor protection are implemented via a range of direct and indirect measures, regulations and codifications rather than by a single instrument such as firing costs or codified shareholder rights. To start with, further instruments to shield labor market insiders against market forces are unemployment insurance, welfare benefits, active labor market policies, centralized wage bargaining, and minimum wages. Unemployment insurance guarantees insiders a certain level of income protection for a limited period of time if insiders are laid off despite of high firing costs.¹⁷ And once unemployment insurance runs out, welfare benefits step in. Active labor market policies are hardly ever designed to directly raise the competitiveness of outsiders vis-à-vis current insiders;¹⁸ instead they protect insiders against structural change in helping them to adjust their skills to the changing needs of the market. Finally, centralized wage bargaining and minimum wages are both instruments to reduce wage differentiation at the lower end of the wage distribution thus protecting insiders against rapid and great wage reductions in case the forces of structural change work to their disadvantage.

Similarly, low protection given to investors by law is just one way of favoring insiders on the capital market. Entrepreneurs/management also want to be protected against interference in their decision-making. Hence, shareholder rights and as a consequence the whole stock market can be expected to be

If part of the workforce gets preferential treatment by firms without legal provisions they will not be willing to expend resources for lobbying that such a treatment is extended by law to all members of the workforce.

¹⁶ This theoretical result conforms with the one in Pagano and Volpin (2001).

¹⁷ Buti et al. (1998) argue that firing costs and unemployment insurance can be regarded as substitutes in their very purpose of protecting insiders, but with unemployment insurance interfering less with structural change.

¹⁸ See Calmfors and Skedinger (1995), and Saint-Paul (1998b).

less developed in corporatist countries.¹⁹ Opaque accounting rules which give entrepreneurs/managers large leeway to manipulate stated profits are another way of shielding insiders on the capital market from interference by outsiders. Furthermore, entrepreneurs and managers want to be protected against competition by new firms and against takeovers by other firms which might lead to their dismissal. Therefore, the venture capital market along with the market for mergers and acquisitions should be larger in capitalist countries compared to corporatist countries. In addition, corporatist institutional arrangements on the capital market are especially tenable if workers themselves are not invested to a large degree in the capital market, otherwise they would be more interested in a high yield on capital and in shareholders' rights. Claims to pension payments are of course the major asset of workers, but only funded pension systems and not pay-as-you-go pension systems give workers a stake in the functioning of capital markets. Hence, a corporatist institutional setting should correlate negatively with the degree of funding of the pension system. Finally, a corporatist institutional setup on the capital market interferes with shareholders' rights to the benefit of stakeholders. To mitigate the resulting problems of corporate governance and of high agency costs a greater concentration of ownership of firms is to be expected in corporatist countries, while dispersed ownership of public firms should occur more often in capitalist countries.²⁰

In the following, we explore whether the relationships between labor and capital markets in general, and in particular the negative link between employment and investor protection predicted by the model can be found empirically in a cross-country analysis. Given the multiplicity of protective arrangements, we refrain from relying on a single indicator for each factor market. Instead, we use a whole set of variables, each of which captures a certain feature of the overall institutional settings.²¹ To this end, we assemble data on labor and the capital market settings in up to 26 OECD countries. The data comes from various sources and largely refers to the situation in the early- to mid-1990s. Time series information on most of these institutional information is not available, so the analysis is confined to the cross-country differences at one point in time.

1. Assessing labor market and capital market arrangements

To characterize labor market arrangements we use a total of 14 indicators which are described in Table 1. Their coverage ranges from the direct protection of employees against dismissal or "exploitation" to the wider labor market environment including unemployment insurance, labor market policies, and the wage setting process. The first variable used to reflect direct protective measures is the OECD's (1999a) summary index of the strictness of employment protection legislation (EPL), which after its

¹⁹ See La Porta et al. (1997).

²⁰ See Bebchuk (1999b), and Coffee (1999).

²¹ See Table 1 (Appendix) for a detailed description of the variables used and their sources.

latest revision covers the situation in 26 member countries in the late 1990s.²² While this index includes regulations for regular and temporary employment as well as collective dismissals, it does not cover other direct protective measures such as working time regulation, employees representation rights, minimum wages. We therefore supplement the EPL index by an index of labor standards (OECD, 1994b and Nickell and Layard, 1998) that includes these aspects in addition to EPL measures.

-Table 1 about here -

To assess the wider labor market environment, we start with the unemployment compensation system. We measure the generosity of income support available to an unmarried unemployed in his first month, second year, and fifth year of unemployment, respectively, by so-called net replacement rates (OECD, 1999b). We also calculate aggregate expenditure on passive labor market policies (unemployment compensation plus expenditure for early retirement for labor market reasons) per person unemployed as a percentage of GDP per member of the labor force as an aggregate indicator of the generosity of the compensation system. In addition, we take into account that there are usually eligibility requirements for the unemployed to access the benefit system such as minimum contribution periods, minimum age, work-availability, and willingness-to-work requirements or stricter rules for job quitters. The tightness of these requirements is indicated by the proportion of the registered unemployed who actually receive unemployment benefits (OECD, 1997a). Apart from compensation via unemployment insurance or via social assistance schemes, it is important to note that a sizable fraction of all persons who lose their job in the "primary" labor market in many countries quickly cease to be officially registered as unemployed by getting enrolled in publicly financed employment programs such as public employment services, training schemes, subsidized employment, youth or disabled programs. We measure the availability of this type of support — which not only has an income- but also a help-for-skill adjustment-component — by the aggregate expenditure on active labor market policies per person unemployed as a percentage of GDP per member of the labor force (Martin, 1998).

As argued above, corporatist labor market arrangements may not only be designed to protect those in regular employment against dismissal and/or the income losses associated with it but also to shield them against the competition from labor market outsiders. The means are collective wage bargaining systems and mandatory minimum wages which both serve to reduce wage differentiation. To account for the latter, we take figures for the ratio of the minimum to the average wage from Nickell and Layard (1998). To measure the degree of centralization of the wage bargaining process, one needs to incorporate how many workers are covered, the level at which bargaining takes place, and the degree of coordination among unions and among employers. We use country rankings for the degree of union coverage, the degree of centralization as well as union coordination and employer coordination from Nickell and Layard (1998). As a check-test we use country rankings for bargaining coverage,

²² As the OECD (1999, 50) points out, there has been "considerable continuity" in employment protection practices in most countries over the 1990s, so the information conveyed in the indicator may roughly apply to the 1990s as a whole.

centralization, and coordination from OECD (1997b) and calculate a summary measure of the degree of centralization by taking the simple average over the three rankings.

With respect to assessing the degree of investor protection on capital markets, we employ a total of 10 indicators. The most direct measure is probably the index of shareholder rights constructed by La Porta et al. (1998) from an analysis of a number of countries' legal rules concerning shareholders voting power, ease of participation in corporate voting, and legal protection against expropriation by management. Since each aspect effectively measures the strength of the legal position of shareholders in relation to that of the firm's management, La Porta et al. call their indicator more precisely an index of "antidirector rights".

However, as pointed out above, low investor protection may manifest itself also indirectly, especially via the characteristics of the capital market. Overall stock markets as well as special parts of them can be expected to be less developed in corporatist regimes. We try to account for the first effect by measuring the size of the stock market by the ratio of market capitalization to GNP and the number of domestic firms listed in relation to the population (both La Porta et al., 1997). We also expect the venture capital market to be less developed and mergers and acquisitions to be less vibrant in countries with low investor protection. As our first indicator of the size of the venture capital market we use the number of funds raised by venture capital firms in 1994 in relation to GNP (OECD, 1996). However, due to diverging national statistical definitions for what counts as a venture capital investment, total funds may not be a reliable estimate of the relative size of the venture capital market's size (Schertler and Stolpe, 2000). We therefore use additional data published in Gompers and Lerner (1999) on early stage investment funds in 1995 of which the authors claim that they are internationally comparable. Concerning the level of mergers and acquisitions we extend the data presented in Pagano and Volpin (2001) on the number of deals per capita in the period 1990-1997 to our larger country set. Moreover, we use the average volume of pension funds' assets from 1991 to 1996 in relation to GNP (OECD, 1998) as a quantitative indicator of the orientation of the pension system towards a funded as opposed to a pay-as-you-go system. We also employ data on ownership concentration, measuring the combined ownership stake of the three largest shareholders in a country's ten largest nonfinancial firms (La Porta et al., 1998), to capture this possible part of a corporatist capital market arrangement. The idea here is that high ownership concentration may be the result of low legal protection of minority investors and therefore an indirect indicator of such a legal practice.

Furthermore, OECD countries differ substantially with respect to the role of banks and thus also with respect to the importance of debt financing of firms. Especially the German law countries Austria, Germany, Japan, South Korea, Switzerland, and Taiwan stand out in these categories. For instance, their average debt to GNP ratio is 0.97 and their average domestic assets of deposit money banks to GDP ratio is 1.22, compared to 0.68 and 0.76 respectively for the English origin countries.²³ In

²³ See La Porta et al. (1997, Table II) and Tsuru (2000); see also Rajan and Zingales (1995), Carlin and Mayer (1999), and Wurgler (2000) for empirical evidence confirming this assessment.

particular for Germany, it is often argued that the close ties between the large banks and non-bank businesses, with bank managers often sitting in firms' supervisory boards, are part of the overall corporatist institutional arrangement which relies less on market forces and more on close, stable, and long-lasting relationships on both, the capital and the labor market, than in Anglo-Saxon countries, where arm's length relationships are predominant (Baums, 1996). We would therefore expect that a high protection of workers' interest goes along with a dominant position of banks. To assess whether this is the case in our sample, we include a variable that measures the position of creditors according to the countries' legal codes. La Porta et al. (1998) for instance find that creditor protection is strongest in German-civil-law countries. It is precisely their overall index of creditors' rights in case of a firm's liquidation or reorganization after default that we use. Moreover, we include a variable that measures the magnitude of debt financing in relation to GNP (La Porta et al., 1997).

2. Empirical Results

Figure 3 presents a view on part of the data. It shows cross-plots of our index of employment protection legislation against the variables measuring shareholder rights, availability of venture capital, mergers and acquisitions activities and the degree of funding of the pension system. As indicated by the dotted lines, for each of the capital market variables the negative relationship indicated by our model seems to exist.²⁴ Clearly, some more formal statistical analysis has to show whether the apparent correlations are indeed non-spurious.

- Figure 3 about here -

To this end we regress each of our labor market variables on each of our capital market variables. Since we have 14 labor market indicators (i^L) and 10 capital market indicators (i^C), we test a total of 140 relationships. Each regression also includes a constant and GNP per capita in 1994. The latter variable is included to control for the effect that richer countries may have higher standards of employment protection simply because they can afford to have them, i.e., the demand and the supply for employment protection is realistically assumed to be increasing in income (Wagner's law).²⁵ The regression equation thus reads

$$i^L = \mathbf{a}_0 + \mathbf{a}_1 i^C + \mathbf{a}_2 \text{GNPperCapita} + \mathbf{e} \quad , \quad (8)$$

where \mathbf{e} is the error term and \mathbf{a}_1 is the coefficient the sign of which is of interest.

Given our theoretical model and the way the labor and the capital market indicators are constructed we would in most cases expect the coefficient \mathbf{a}_1 to have a negative sign. For instance, when we regress the index of employment protection on the variable indicating the degree of legal investor protection, the

²⁴ The empirical fact that employment protection legislation is across countries negatively related to both shareholder rights and mergers and acquisitions has already been established by Pagano and Volpin (2001).

²⁵ It was suggested to us that the degree of openness should be included as an additional explanatory variable. However, this leaves the overall regression results essentially unchanged. These additional regression results are available upon request.

sign should be negative as we expect countries with low levels of employment protection also to grant a relatively high amount of legal protection to capital owners ('Anglo-Saxon countries') and countries which have tightly regulated labor markets to give investors less protection. The only exception from this sign rule is the ownership concentration variable since, as pointed out above, higher ownership concentration is an indication of less protection of minority investors; we therefore expect a positive relationship with the labor market indicators. Note, that our theoretical model does not predict any causal relation between the labor and the capital market institutions. Both are determined simultaneously in the politicoeconomic process. Therefore our empirical equation (8) can not be given any direct structural or causal economic interpretation. All we would like to measure are the reduced form relationships between the indicators of labor and capital market institutions, being aware that the mechanisms generating these relationships can not be uncovered from our estimates alone. This implies that the chosen normalization with respect to the labor market indicators does not indicate a direction of causation.

Each equation is checked for non-normally distributed residuals, and White's (1980) heteroscedasticity-consistent standard errors are used to compute inference statistics, because countries can be expected to form clusters producing heteroscedasticity problems and correlated error terms in such a cross-country study. As data availability differs across countries and indicators, so does the number of observations used in the regressions; the range is between 18 and 26 observations, in most cases it is about 20.

The results of the regressions, given in Table 2, are highly supportive of the theory that high employment protection goes hand in hand with low investor protection. Starting with the labor market indicators, we find that our indices of employment protection legislation and labor standards are significantly negatively correlated with virtually all of our proxies for investor protection. For instance, from our first regression we see that one point more on the index of shareholder rights (which takes integer values between 0 and 5, see La Porta et al. 1998) on average over the 22 countries in the sample comes along with half a point less in the index that measures employment protection (which takes values between 0.7 and 3.7 in our sample).

The results are also quite well in line with the predictions of our model when we measure corporatist or non-corporatist labor market institutions by more indirect indicators such as the centralization of wage bargaining. Both the individual indicators for union coverage and coordination, employer coordination, the degree of centralization, as well as the overall index which was constructed from a different source, produce significant relationships with the expected signs. This points to the conclusion that lower investor protection is usually accompanied by a centralized wage bargaining process, which is indeed a crucial ingredient of all corporatist regimes. For the minimum wage as well as for our indicators of the unemployment insurance system, the negative relationships seem to be weaker but also existent. The postulated negative relationship between investor protection and unemployment benefits comes out most

clearly for the indicators based on aggregate spending on passive and active labor market policies while it seems to be rather diffuse when net replacement rates are used as proxies.

As regards our indicators of the capital market setting, we conclude that M&A-activity and ownership concentration seem to be weaker indicators of a corporatist/non-corporatist capital-market setting than the other investor protection proxies. In addition, we find that a significant correlation between the creditor rights variable and the labor market variables can only be established in two cases. The share of debt finance in GNP, which was used as a further proxy of the creditors position, was found significant more often but in most cases with a negative sign. If a relatively high proportion of debt finance were an indicator of a corporatist capital market arrangement, the relationship should be positive. We therefore tend to conclude that the idea that a strong position of creditors, especially banks, along with heavy reliance on debt financing are key elements of corporatist arrangements, is not supported by our data.

IV. Conclusions

It is the key result of the paper that institutional structures on capital and labor markets are not independent from each other, but that they are rather strongly intertwined by politicoeconomic forces. Our politicoeconomic model predicts that the institutional setting on both, the labor and the capital market, depends on which type of coalition of interest groups supports the government via votes and/or via campaign contributions. Corporatist countries, where a coalition between workers and entrepreneurs prevails, should be characterized by labor market institutions which favor incumbent workers, the so called insiders, thus exhibiting a considerable degree of rigidities on the labor market. Furthermore, they should have capital market institutions which are beneficial to entrepreneurs and managers, in particular, a relatively weak effective legal protection of investors in firms and ample possibilities for entrepreneurs and managers for discretionary decision making. Important characteristics of such an institutional setting on capital markets which is favorable to entrepreneurs and managers would, e.g., be a weak position of shareholders vis à vis firms and underdeveloped venture capital and takeover markets.

In contrast, more capitalist countries in which a political coalition between entrepreneurs and investors dominates political decision making should exhibit more flexible labor markets along with a more elaborate effective legal protection of investors in general and of shareholders in particular. Put simply, investors substitute workers in influencing the political decision-making process so that the interest of investors in a flexible labor market and in an institutional setting on the capital market which is more favorable to them should be reflected in the actual institutions. Hence, along the lines established by Pagano and Volpin (2001) our simple politicoeconomic model also predicts that labor and capital market institutions are not independent from each other. Rather across countries, rigid labor markets are expected to be accompanied by an institutional setup on capital markets which is favorable to entrepreneurs and managers and vice versa. In other words, there should be a negative cross-country relationship between different measures of labor market rigidities and of competition on capital markets.

This theoretical outcome received strong support by our cross-country empirical analysis, which produced a large number of significant correctly signed relationships between our proxies for the degrees of competition on labor and on capital markets. Hence across countries, non-competitive structures are not restricted to the labor market but rather also extend to the institutional setup on capital markets. This theoretical and empirical result reinforces the notion of complementarities in undertaking structural reforms. Based on our results it is unlikely that structural reforms of rigid labor markets on their own will be successful, but that they should rather be accompanied or maybe even be preceded by changes also in the institutional setting on capital markets in favor of a more competitive setting. In fact, considering that a well-functioning venture capital market affects positively the creation rate of new firms, the degree of competition on the product market is also raised. Indeed, a recent study by Nicoletti, Scarpetta, and Boylaud (1999) found that barriers to entrepreneurship are largest in countries where employment protection is most stringent, even though they did not take differences in institutions on capital markets such as the availability of venture capital into account at all. Hence, based on their empirical analysis our results might generalize to even include the product market as well, so that structural reforms should encompass all three markets.

Hence, it is not only tradition and path dependence which prevent drafting laws which would adapt these institutional settings to economic requirements, but politicoeconomic incentives seem to matter just as well. The question therefore arises how this politicoeconomic incentive structure is going to change endogenously. The theoretical analysis points to at least four potentially important forces of change. First, the globalization in particular of capital markets makes the non-competitive equilibrium less viable because investors are provided with a better exit option and because the opportunity costs of maintaining institutional structures which are biased toward insider protection rise with globalization. Countries featuring unattractive institutional structures for investors forego foreign direct investments under the conditions of globalized capital markets thus creating a positive externality for those countries where foreign direct investments are diverted to. Second, the accelerating speed of structural change toward the service and information technology sectors, i.e., the much-discussed move to the “new economy”, raises the economic benefits of an institutional environment which facilitates structural change, e.g., by providing a flexible labor market and a well-functioning venture capital market, and undercuts the viability of clinging to the status quo in countries with corporatist institutions (Belke and Fehn, 2000). Third, the political clout for better investor protection will also increase with more widespread capital or profit sharing of workers, a tendency which can already be observed especially in fledgling firms of the “new economy”. Fourth, pressure on continental European welfare states is mounting to reform their pension systems in the direction of more funding and a smaller pay-as-you-go component. However, such a development will make elaborate investor protection and a well-functioning stock market more important to ordinary workers thus broadening its electorate support.

In sum, the current institutional setup on capital and labor markets in continental Europe is under increasing pressure to adapt to the new conditions shaped by globalization and rapid structural change. Substantial changes are already occurring on capital markets in continental Europe, while institutions on

labor markets display greater inertia and lag behind. Yet, the more capital markets will have adjusted in the direction of the Anglo-Saxon model, the less sustainable will also the rigid arrangement on labor markets become, as a crucial ingredient of the politicoeconomic equilibrium in favor of insiders will have vanished.

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Appendix

The purpose of this appendix is to explicitly derive the slope and shape of the indifference curves of the three types of agents in the (I, f) -plane. Investors simply maximize their end of period-3-wealth:

$$U_I = \mathbf{b}_I V(I, f). \quad (\text{A1})$$

Hence, the utility of investors depends positively on I and negatively on f :

$$\frac{\partial U_I}{\partial I} = \mathbf{b}_I \frac{\partial V}{\partial I} > 0, \quad (\text{A2})$$

$$\frac{\partial U_I}{\partial f} = \mathbf{b}_I \frac{\partial V}{\partial f} < 0. \quad (\text{A3})$$

The indifference curves of investors are positively sloped and of concave shape in the (I, f) -plane, which can be seen explicitly by setting the total derivative of their utility function equal to zero, and by taking the second order derivative of the result:

$$\left. \frac{df}{dI} \right|_{\bar{U}_I} = - \frac{\frac{\partial V}{\partial I}}{\frac{\partial V}{\partial f}} > 0, \quad (\text{A4})$$

$$\left. \frac{d^2 f}{dI^2} \right|_{\bar{U}_I} = - \frac{\frac{\partial V}{\partial f} \cdot \frac{\partial^2 V}{\partial I^2}}{\left(\frac{\partial V}{\partial f} \right)^2} < 0, \quad (\text{A5})$$

because it is assumed that $\frac{\partial^2 V}{\partial I^2} = - \frac{\partial^2 D}{\partial I^2} < 0$.

Workers equivalently maximize their income in period 3. It needs to be kept in mind that out of all nm workers, the share $(1-x)^2$ are low-productivity workers who work from the start for firms which ex post turn out to be bad. They only receive the wage w during the second production cycle, while the complement of $2x-x^2$ workers receive $w+f$.²⁶

$$U_w = \mathbf{b}_w V(I, f) + w_1 + w_2 = \mathbf{b}_w V(I, f) + w_1 + (w_1 + f)(2x - x^2) + w_1(1-x)^2. \quad (\text{A6})$$

Hence, partial derivatives with respect to I and f are as follows:

$$\frac{\partial U_w}{\partial I} = \mathbf{b}_w \frac{\partial V}{\partial I} > 0. \quad (\text{A7})$$

²⁶ One could of course include negative components for work effort but that would not affect the results as long as disutility from work is independent from f and I .

$$\frac{\partial U_w}{\partial f} = \mathbf{b}_w \frac{\partial V}{\partial f} + 2x - x^2 = x(2 + \mathbf{b}_w xn - 2\mathbf{b}_w n - x). \quad (\text{A8})$$

Workers gain from higher investor protection as long as they hold some shares. In contrast, the sign of the partial derivative of workers' utility with respect to firing costs is undetermined because there are two opposing effects. Workers profit directly from higher firing costs as they raise their expected income from working in the second production cycle, but they lose as shareholders because all shareholders are negatively affected by higher firing costs. It is realistically assumed that the former effect dominates the latter effect so that workers gain from higher firing costs. This is in particular the case if workers share of equity holdings as denoted by \mathbf{b}_w is small:

$$\frac{\partial^2 U_w}{\partial \mathbf{b}_w \partial f} = xn(x - 2) < 0. \quad (\text{A9})$$

Under the assumption that utility of workers does indeed depend positively on firing costs, their indifference curves are downward sloped and convex in the (\mathbf{I}, f) -plane:

$$\left. \frac{df}{d\mathbf{I}} \right|_{\bar{u}_w} = \frac{-\mathbf{b}_w \frac{\partial V}{\partial \mathbf{I}}}{\mathbf{b}_w \frac{\partial V}{\partial f} + 2x - x^2} < 0, \quad (\text{A10})$$

$$\left. \frac{d^2 f}{d\mathbf{I}^2} \right|_{\bar{u}_w} = \frac{\left(\mathbf{b}_w \frac{\partial V}{\partial f} + 2x - x^2 \right) \cdot \left(-\mathbf{b}_w \frac{\partial^2 V}{\partial \mathbf{I}^2} \right)}{\left(\mathbf{b}_w \frac{\partial V}{\partial f} + 2x - x^2 \right)^2} > 0. \quad (\text{A11})$$

Finally, the utility function of entrepreneurs needs to be discussed. Entrepreneurs are also assumed to maximize their income in period 3 which is composed of their income as shareholders of their own firms plus the private benefits B they derive from diverting the amount of money D from the firm previous to paying out shareholders:

$$U_E = \mathbf{b}_E V(\mathbf{I}, f) + B[D(\mathbf{I}), \mathbf{I}]. \quad (\text{A12})$$

By making use of equation (10), we can show that the utility of entrepreneurs does indeed, as expected, depend negatively on investor protection and firing costs:

$$\frac{\partial U_E}{\partial \mathbf{I}} = \mathbf{b}_E \frac{\partial V}{\partial \mathbf{I}} + \frac{\partial B}{\partial D} \cdot \frac{\partial D}{\partial \mathbf{I}} + \frac{\partial B}{\partial \mathbf{I}} = \frac{\partial D}{\partial \mathbf{I}} \left(\frac{\partial B}{\partial D} - \mathbf{b}_E \right) + \frac{\partial B}{\partial \mathbf{I}} = \frac{\partial B}{\partial \mathbf{I}} < 0, \quad (\text{A13})$$

$$\frac{\partial U_E}{\partial f} = \mathbf{b}_E \frac{\partial V}{\partial f} < 0. \quad (\text{A14})$$

Hence, the indifference curves of entrepreneurs are downward sloping in the (\mathbf{I}, f) -plane:

$$\frac{df}{dI} \Big|_{\bar{U}_E} = \frac{\mathbf{b}_E \frac{\partial V}{\partial I} + \frac{\partial B}{\partial D} \cdot \frac{\partial D}{\partial I} + \frac{\partial B}{\partial I}}{-\mathbf{b}_E \frac{\partial V}{\partial f}} = \frac{\frac{\partial B}{\partial I}}{-\mathbf{b}_E \frac{\partial V}{\partial f}} < 0. \quad (\text{A15})$$

It is at this point important to keep in mind that the parties are asked about their preferences concerning legislation ex post in $t = 0$, after capital has been raised by entrepreneurs. As capital is raised in $t = -1$, any agency costs due to low ex ante investor protection have already been borne by entrepreneurs at the outset and are sunk at $t = 0$.

Assuming furthermore that the degree of investor protection affects private benefits of diversion negatively at an increasing rate, indifference curves of entrepreneurs are concave in the (I, f) -plane as would be expected with two bads:

$$\frac{d^2 f}{dI^2} \Big|_{\bar{U}_E} = \frac{-\mathbf{b}_E \frac{\partial V}{\partial f} \cdot \frac{\partial^2 B}{\partial I^2}}{\left(-\mathbf{b}_E \frac{\partial V}{\partial f}\right)^2} < 0. \quad (\text{A16})$$

Figure 1: The timing of events

$t = -1$	$t = 0$	$t = 1$	$t = 2$	$t = 3$
firms are set up by hiring labor and by acquiring capital, labor and financial contracts are signed	legislation on employment and investor protection is passed	1 st production cycle ends, initial output is produced and initial wages are paid	innovation shock occurs, workers are reallocated, firing costs are paid out, new labor contracts are signed	2 nd production cycle ends, final wages are paid, entrepreneurs divert money and pay out shareholders

Source: Adapted from Pagano and Volpin (2001).

Figure 2: Indifference and contract curves

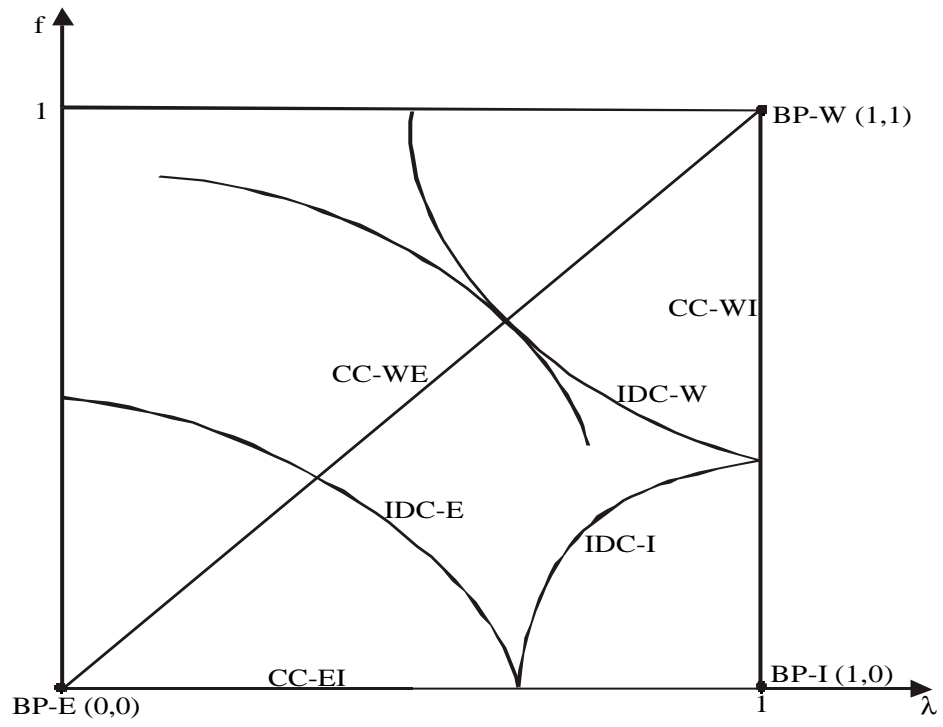


Figure 3: Employment Protection Legislation Index and Selected Capital Market Variables

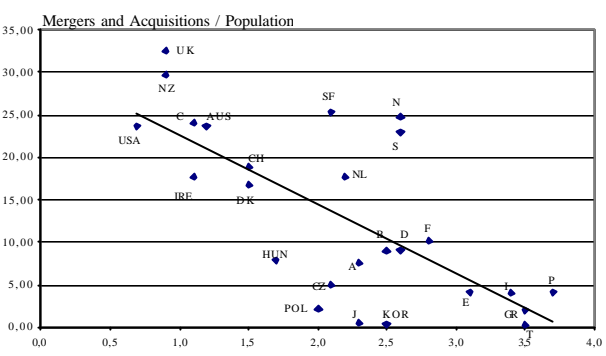
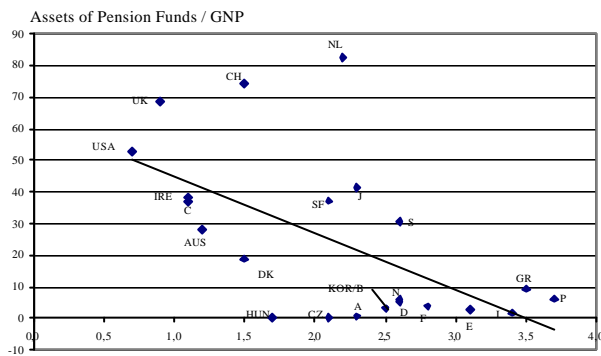
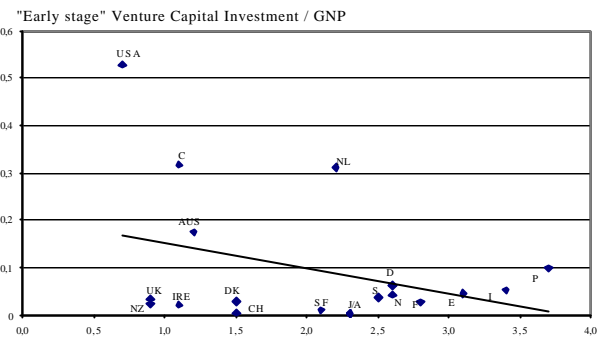
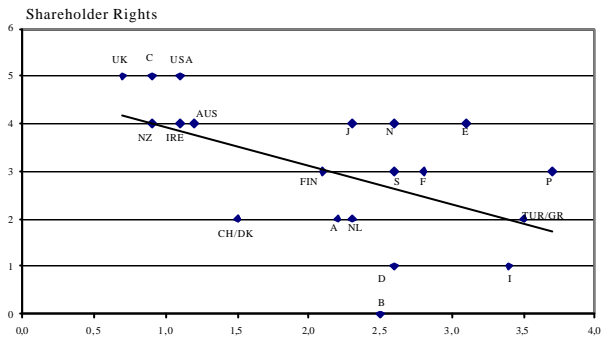


Table 1: Description of the Labor Market and Capital Market Variables

Labor market variables	
Employment protection index	Index of the strictness of employment protection legislation in the late 1990s. Source: OECD (1999a), Table 2.5, ("Overall EPL strictness, Version 2").
Labor standards index	Index of labor standards in the period 1985-1993 enforced by legislation on working time, fixed-term contracts, employment protection, minimum wages and employees representation rights. Source: OECD (1994b), Table 4.8, and extended in Nickell/Layard (1998), Table 2.
Net replacement rate 1st month, second year, fifth year	Unemployment benefits (after tax, including social assistance benefits, family and housing benefits) received 1997 by a single unemployed person in the 1st month, the second year and the fifth year of unemployment, resp., in percent of the previous wage. Source: OECD (1999b), Annex Table A.1.
Relative spending on passive labor market policies	Expenditure on passive labour market measures (unemployment compensation plus expenditure for early retirement for labor market reasons) (source: OECD, 1999a, Annex Table H), divided by standardized unemployment rates (source: OECD 1999c). Own calculations. The variable is the average of this ratio over the periods 1995 to 1997.
Unemployment benefits received/number of unemployed	Unemployment benefits recipients in percent of registered unemployed. Source: OECD (1997a), Table 6. The variable is the average of the data for 1990 and for 1995. Own calculations.
Relative spending on active labor market policies	Expenditure on active labor market policies per person unemployed as a percentage of GDP per member of the labour force. Source: Martin (1998), Table 2. The variable is the average of the data for 1990 and for 1996. Own calculations.
Minimum wage to average wage	Ratio of minimum to average wage 1991-1994. Source: Nickell and Layard (1998), Table 5.
Union coverage	Index of union coverage, early 1990s. Source: Nickell and Layard (1998), Table 3.
Union coordination	Index of union coordination, early 1990s. Source: Nickell and Layard (1998), Table 3.
Employer coordination	Index of employer coordination, early 1990s. Source: Nickell and Layard (1998), Table 3.
Index of the degree of centralization	Centralization ranking. Source: Nickell and Layard (1998), Table 3, cited from Calmfors and Drifill (1988).
Index coverage, centralization, coordination	Index of the country rankings for union bargaining coverage, centralization and coordination. Own calculation from the data in OECD (1997b), Table 3.3. The variable is constructed by first taking the average of the rankings in 1990 and 1994 for each of the three aspects (bargaining coverage, centralization and coordination) and then calculating the average over the three aspects. The resulting series is multiplied by -1, so that an increase in the index indicates an increase in centralization.
Capital market variables	
Shareholder rights (antidirector rights)	Index of the legal system's protection of minority shareholders against managers and dominant shareholders. It includes regulations on voting rights attached to shares, rights that support the voting mechanism against interference by insiders and rights to call extraordinary shareholder's meetings. Source: La Porta et al. (1998), Table 2.
Stock market capitalization held by minorities/GNP	Ratio of the stock market capitalization held by minorities to gross national product, 1994. Source: La Porta et al. (1997), Table II.
Domestic firms listed/population	Ratio of the number of domestic firms listed in a given country to its population, 1994. Source: La Porta et. al. (1997), Table II.
Funds raised/GNP	Total funds raised by venture capital firms 1994. Source: OECD (1996) Table 1. The variable is this data divided by GNP in 1994, own calculations.
Early stage investment funds/GNP	Early stage investment funds in each country outside the United States, total venture capital funds for the United States. Authors claim these to be most comparable. Source: Gompers and Lerner (1999), Table 1.5. The variable is this data divided by GNP in 1994, own calculations.
M&A/population	Ratio of the number of M&A deals in a country to its population. The variable is the average of this ratio over the period of 1990 to 1996. Source: Pagano and Volpin (2001), own calculations from The Merger Yearbook and IMF (1999).
Assets of pension funds/GDP	Assets of pension funds in percent of GDP. Source: OECD (1998), Table V.1. The variable is the average of the data for 1991 to 1996.
Ownershipstake of three	Mean ownershipstake of three largest shareholders on the 10 largest private non-

largest shareholders on the 10 largest private non-financial firms	financial firms. Source: La Porta et al. (1998), Table 7.
Creditor rights	Index of the legal system's protection of creditors in case of a firms liquidation or reorganization. Source: La Porta et al. (1998), Table 4.
Debt finance/GNP	Ratio of the sum of bank debt of the private sector and outstanding non-financial bonds to GNP in 1994, or last available. Source: La Porta et al. (1997), Table II.

Table 2: Ordinary Least Squares Regressions of Indicators of the Labor Market Setting on Indicators of the Capital Market Setting

Labor market setting	Capital market setting										Signif. coeff.
	Shareholder rights (Antidirector rights)	Size of stock market		Venture Capital		M&A/ Population	Assets of pension funds/GNP	Ownershipstake of three largest shareholders on the 10 largest private non-financial firms	Creditor rights	Debt finance/ GNP	
		Stock market capitalization held by minorities/GNP	Domestic firms listed/ population	Funds raised/ GNP	Early stage investment funds/GNP						
<i>Employment protection/Labor standards</i>											
Employment protection index	-0.515 (-6.445)**	-2.287 (-5.046)**	-0.035 (-9.152)**	-447.552 (-12.012)**	-2.300 (-2.728)**	-0.063 (-5.384)**	-0.020 (-2.985)**	3.934 (3.707)**	-0.117 (-0.558)	-0.697 (-0.991)	8
	N 22	22	22	20	20	26	23	22	22	21	
	R ² /BJ/F	0.64/0.54/52.0	0.40/1.83/36.5	0.57/1.77/93.1	0.48/2.28/121.2	0.13/0.63/6.7	0.50/1.99/81.3	0.34/1.17/13.5	0.36/0.93/22.7	0.13/2.42/6.0	0.13/2.26/7.8
Labor standards index	-1.176 (-4.695)**	-5.790 (-4.991)**	-0.071 (-4.313)**	-930.844 (-2.856)**	-5.884 (-2.367)**	-0.092 (-1.725)*	-0.043 (-2.137)**	9.734 (3.067)**	-0.272 (-0.500)	-1.642 (-0.803)	7
	N 20	20	20	19	20	20	19	20	20	19	
	R ² /BJ/F	0.55/0.15/24.1	0.40/0.56/24.9	0.39/2.19/19.5	0.30/0.64/22.6	0.17/0.53/8.0	0.19/0.38/9.2	0.29/0.97/9.4	0.31/1.18/9.8	0.05/0.82/2.1	0.06/1.25/1.6
<i>Unemployment benefits/Active labor market policy</i>											
Net replacement rate 1st month	-2.609 (-1.161)	-8.737 (-0.945)	-0.304 (-2.231)**	-3.232e+003 (-1.713)*	1.413 (0.094)	-0.284 (-1.068)	-0.035 (-0.305)	10.119 (0.490)	-2.459 (-1.116)	7.645 (0.830)	1
	N 21	21	21	20	20	25	23	21	21	20	
	R ² /BJ/F	0.22/0.16/10.1	0.18/0.13/8.0	0.30/1.21/25.5	0.20/0.40/10.9	0.12/0.34/2.3	0.20/0.69/13.4	0.09/1.18/4.7	0.17/0.14/5.0	0.19/0.17/8.8	0.13/0.47/3.7
Net replacement rate second year	-10.928 (-4.002)**	-0.333 (-0.019)	-0.473 (-6.159)**	3775.813 (1.399)	-64.641 (-2.082)**	0.366 (0.913)	0.078 (0.427)	-12.058 (-0.273)	1.308 (0.371)	22.513 (1.424)*	3
	N 21	21	21	20	20	25	23	21	21	20	
	R ² /BJ/F	0.81/0.01/8.4	0.02/2.63/5.4	0.81/0.63/21.8	0.06/1.91/6.0	0.52/0.97/10.1	0.06/2.31/5.3	0.03/3.15/5.8	0.03/2.51/5.3	0.03/2.38/5.3	0.07/2.09/10.4
Net replacement rate fifth year	-0.329 (-0.085)	10.725 (0.658)	0.033 (0.189)	3641.662 (2.099)**	-48.017 (-1.699)*	0.607 (1.997)	0.108 (0.721)	-15.126 (-0.403)	6.950 (2.476)**	16.901 (1.334)*	3
	N 21	21	21	20	20	25	23	21	21	20	
	R ² /BJ/F	0.24/1.33/11.7	0.25/1.31/11.2	0.24/1.19/11.6	0.30/0.59/14.2	0.25/0.62/12.1	0.25/1.56/17.0	0.19/1.48/10.2	0.24/1.41/15.1	0.34/0.62/21.3	0.27/1.84/30.7
Relative spending on passive labor market policies	-0.026 (-1.588)*	-0.162 (-2.530)**	-0.000 (-0.613)	0.986 (0.055)	-0.381 (-4.597)**	0.000 (0.153)	-0.001 (-1.052)	0.324 (1.998)**	0.010 (0.436)	-0.255 (-1.918)**	4
	N 22	22	22	20	20	26	23	22	22	21	
	R ² /BJ/F	0.78/1.09/67.4	0.78/1.46/29.0	0.73/1.02/47.4	0.74/0.59/32.7	0.82/1.53/107.0	0.74/0.72/44.9	0.78/0.28/32.0	0.79/1.29/47.3	0.74/1.06/26.8	0.53/1.24/13.9
Unemployment benefits received/ number of unemployed	-2.345 (-0.556)	-2.150 (-0.111)	0.329 (1.991)**	4899.612 (2.239)**	-22.286 (-0.356)	1.144 (2.498)**	0.280 (0.942)	28.994 (0.703)	4.594 (1.317)	-6.625 (-0.290)	3
	N 20	20	20	19	19	20	19	20	20	19	
	R ² /BJ/F	0.03/0.19/24.8	0.02/0.24/17.8	0.07/0.97/23.7	0.08/0.71/36.1	0.02/0.92/15.8	0.18/1.53/30.8	0.09/0.35/12.5	0.04/0.37/26.4	0.05/0.30/29.3	0.02/0.32/45.3

Relative		-0.153	-0.711	-0.009	53.256	-1.107	0.011	-0.003	0.615	0.043	-0.854
spending on		(-2.654)**	(-1.867)**	(-1.768)**	(0.571)	(-1.842)**	(0.944)	(-0.739)	(0.605)	(0.419)	(-2.275)**
active labor	N	21	21	21	20	20	25	23	21	21	20
market policies	R ² /BJ/F	0.15/0.33/8.9	0.09/0.74/7.3	0.09/0.65/13.3	0.02/1.05/5.1	0.12/0.84/10.8	0.10/1.23/3.5	0.06/0.97/6.3	0.02/0.86/3.6	0.01/1.10/3.7	0.18/0.90/11.4

Table 2 continued

Labor market setting	Capital market setting										signif. coeff.
	Shareholder rights (Antidirector rights)	Size of stock market		Venture Capital		M&A/ Population	Assets of pension funds/GNP	Ownershipstake of three largest shareholders on the 10 largest private non-financial firms	Creditor rights	Debt finance/ GNP	
		Stock market capitalization held by minorities/GNP	Domestic firms listed/ population	Funds raised/ GNP	Early stage investment funds/GNP						
<i>Wage setting</i>											
Minimum wage to average wage	-0.031 (-1.529)*	-0.339 (-2.528)**	-0.002 (-1.083)	-15.306 (-0.899)	-0.023 (-0.141)	0.001 (0.306)	-0.003 (-1.980)**	0.401 (1.534)*	0.034 (1.065)	-0.263 (-2.429)**	3
	N 21	21	21	20	20	21	20	21	21	20	
	R ² /BJ/F 0.24/1.74/6.3	0.36/2.21/8.0	0.21/1.18/7.5	0.21/1.35/5.6	0.18/1.11/5.2	0.19/0.84/6.3	0.35/1.76/8.1	0.26/2.20/6.1	0.22/1.33/4.4	0.25/3.13/10.0	
Union coverage	-0.277 (-3.178)**	-1.157 (-6.247)**	-0.011 (-2.019)**	-149.270 (-2.000)**	-2.205 (-2.288)**	-0.023 (-1.905)**	-0.008 (-2.033)**	2.270 (2.463)**	-0.081 (-0.716)	-0.780 (-2.464)**	9
	N 20	20	20	19	20	20	19	20	20	19	
	R ² /BJ/F 0.47/0.57/28.8	0.67/2.96/40.1	0.59/0.42/13.4	0.67/1.93/40.4	0.33/1.69/7.8	0.21/3.34/16.4	0.70/0.81/23.0	0.28/2.52/10.1	0.49/3.25/4.9	0.61/2.02/8.6	
Union coordination	-0.160 (-1.815)**	-1.664 (-3.783)**	-0.010 (-1.326)	-280.412 (-6.132)**	-1.650 (-2.177)**	-0.023 (-1.873)**	-0.017 (-2.902)**	1.888 (1.728)*	0.143 (0.775)	-0.964 (-2.636)**	7
	N 20	20	20	19	20	20	19	20	20	19	
	R ² /BJ/F 0.14/0.18/6.0	0.33/0.34/19.1	0.11/0.65/5.5	0.24/0.22/27.8	0.15/0.62/5.4	0.15/0.75/18.0	0.40/1.37/24.8	0.15/0.21/3.6	0.09/1.15/3.2	0.34/1.11/22.5	
Employer coordination	-0.294 (-3.075)**	-1.862 (-3.772)**	-0.014 (-2.280)**	-196.617 (-2.420)**	-2.493 (-3.760)**	-0.015 (-0.879)	-0.012 (-2.551)**	3.099 (3.572)**	0.100 (0.589)	-0.746 (-1.642)	7
	N 20	20	20	19	20	20	19	20	20	19	
	R ² /BJ/F 0.54/2.24/32.9	0.58/0.93/56.0	0.42/1.12/117.7	0.36/1.23/61.9	0.49/1.46/40.4	0.36/0.93/53.7	0.42/0.97/96.2	0.51/1.41/45.3	0.34/0.92/32.1	0.33/0.71/34.8	
Index of the degree of centralization	-0.820 (-1.150)	-8.691 (-2.194)**	-0.026 (-0.588)	-957.915 (-2.284)**	-13.280 (-2.373)**	0.024 (0.249)	-0.075 (-1.757)**	12.045 (1.508)*	1.935 (1.848)**	-4.414 (-1.527)*	6
	N 20	20	20	19	20	20	19	20	20	19	
	R ² /BJ/F 0.06/1.02/16.3	0.18/1.15/15.8	0.01/1.05/12.6	0.06/0.97/16.3	0.15/1.12/12.8	0.00/0.76/9.9	0.16/1.48/23.0	0.09/0.60/14.9	0.17/1.04/18.2	0.12/0.74/57.7	
Index coverage centralization coordination	-2.303 (-3.870)**	-12.697 (-4.313)**	-0.132 (-3.165)**	-2392.886 (-4.392)**	-17.666 (-3.473)**	-0.190 (-1.788)**	-0.098 (-2.735)**	19.713 (3.140)**	-0.127 (-0.106)	-5.232 (-1.664)*	8
	N 19	19	19	18	19	19	18	19	19	18	
	R ² /BJ/F 0.47/1.00/42.5	0.42/1.39/21.3	0.30/0.88/232.1	0.25/2.43/26.2	0.29/1.39/17.7	0.17/0.48/34.7	0.31/0.19/34.4	0.27/0.74/14.0	0.02/0.99/4.8	0.10/0.65/7.6	
signif. coeff.	8	10	9	9	10	6	8	6	2	5	

Notes: Each coefficient indicates the regression coefficient of one of the labor market variables on one of the capital market variables, a constant and the log of 1994-per capita- GNP.
 t -statistics in paranthesis based on heteroscedasticity robust standard errors, ** indicates significance at 5%, * at 10%.
N indicates the number of observations the regression is based on.
 R^2 is the coefficient of determination.
BJ is the Bera-Jarque test statistic for residual non-normality.
F is the F-statistic of the hypothesis that capital market indicator and the GNPperCapita variable are jointly zero.