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On the determinants of labour market institutions: Rent-sharing vs. social insurance*

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Abstract

What determines the structure of labour market institutions? This paper argues that common explanations based on rent sharing are incomplete; unions, job protection, and egalitarian pay structures may have as much to do with social insurance of otherwise uninsurable risks as with rent sharing and vested interests. In support of this more benign complementary hypothesis the paper presents a range of historical, theoretical, and cross-country regression evidence. The social insurance perspective changes substantially the assessment of often-proposed reforms of European labour market institutions. The benefits from eliminating labour market rigidities have to be set against the costs of reduced coverage of human capital related risk. The paper also argues that it is unclear whether the forces of globalisation, and the new economy, will really force countries to make their labour markets more flexible. While these phenomena may increase the efficiency costs of existing institutions, they may also make people more willing to pay a high premium to preserve institutions that provide insurance.

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1. Introduction

What determines the structure of labour market institutions? Today, it seems to be widespread agreement among economists that European labour market institutions mainly reflect the rent-seeking activities of labour unions and employed insiders, and that these institutions create a lot of wastage, in the form of high unemployment, and compressed wage structures that distort people's incentives to acquire human capital. As a corollary it is often argued that far-reaching labour market deregulation is the only way to improve the workings of the labour markets of continental Europe.

In this paper I provide a more benevolent perspective on European labour market institutions. While rent seeking is a powerful motivator, so is the desire for social insurance. Since private insurance markets are less likely to accommodate the demand for insurance against labour income risk, and since human capital is the by far most important asset for most individuals, a *laissez faire* economy need not be a very attractive place to live in. It is well known that this market incompleteness can serve as a theoretical rationale for redistributive tax policy, and maybe even for the welfare state.¹ But it also suggests that many features of European labour markets (like job security legislation, egalitarian wage policies of unions, and collective bargaining) can be thought of as second best instruments of risk sharing, which – in an admittedly crude and imperfect way – make up for the absence of a complete set of contingent markets.²

To support this social insurance interpretation of labour market institutions I bring in a range of evidence. First, I review some historical evidence on the origins of labour market institutions in two countries that are at the polar ends of the rigid-flexible spectrum, Sweden and the United States. This comparative evidence strongly suggests that

¹ See e.g. Atkinson (1999), Barr (1987), Drèze (2000), Sandmo (1998), and Sinn (1996).

² The idea that labour market institutions can be thought of as devices that correct for market failures is not novel; see Blank and Freeman (1993), Gregg and Manning (1997) and Agell (1999) for further discussions.

many of the labour market rigidities that today are blamed as main causes of unemployment originally emerged as a defensive response to the threat of unemployment and income insecurity. Second, I present a simple model formalising the idea that institutionalised wage compression (which is often viewed upon as the hallmark of the European labour market compact) can be thought of as a welfare enhancing device, which provides social insurance, albeit at a cost in the form of unemployment. Third, I report new cross-country evidence on the determinants of labour market institutions; these regressions are not easy to reconcile with a story that treats rent seeking as the sole engine in the development of labour market institutions.

If trade unions, job protection and egalitarian pay structures really have as much to do with social insurance as with rent sharing, some unorthodox implications seem to follow. First, according to the received wisdom, increased wage differentials are key ingredients in a policy to combat unemployment. But as I show below, it is quite conceivable that such labour market reform can be successful in lowering unemployment, at the same time that aggregate welfare *decreases*, because of a concomitant loss of social insurance. Second, it is commonplace to argue that globalisation, and the move towards a more flexible organisation of the work place (think of the “new economy”), will bring about a gradual dismantling of European style labour market institutions. But if these developments increase the risks of investing in human capital, the demand for risk sharing via labour market institutions may well increase in the future. Third, to the extent that current institutions reflect a genuine demand for economic security, comprehensive labour market deregulation might provoke a popular demand for alternative (potentially more disruptive) policies, like outright protectionism.

Much of the discussion has a counterpart in the large literature on the nature and origin of the welfare state. This should come as no surprise, since in much of Europe

the institutions of the labour market and those of the welfare state are integral parts of the same system. The observation that the changing structure of the labour market is a key factor in understanding the origin and development of social insurance is developed at length in e.g. Piore (1987) and Atkinson (1991). The discussion of institutional wage compression as a second best, risk sharing device draws on Agell and Lommerud (1992), and relates to the works of e.g. Varian (1980) and Eaton and Rosen (1980) on redistributive taxation. The cross-country evidence on the determinants of labour market institutions, emphasising variables like openness and linguistic fractionalisation, is closely related to recent work on the determinants of growth and the size of government; see e.g. Easterly and Levine (1997), Rodrik (1998), and Alesina, Baqir and Easterly (1999).

2. On the origin of labour market institutions

What comes first, the chicken or the egg? According to the conventional view institutions like job security legislation, unions, and benefits are main causes of unemployment.

According to many social historians the main line of causation goes in the opposite direction – the very same institutions once developed as a defensive *response* to the threat of unemployment and income insecurity. Let me briefly review some of this evidence, gathered from the distant past when the new economy was a matter of railways and the steam engine, rather than dot.com. To focus my discussion, I concentrate on developments in two countries, which today often are considered to be poles apart when it comes to labour market structures, the United States and Sweden.

In his study of the origin and evolution of unemployment in Massachusetts in the 19th century, Alexander Keyssar (1986) draws on a range of contemporary sources (newspaper articles, reports from charities, union protocols, government documents, etc.) to illuminate how structural change and modernization altered the workings of the labour

market. In the early (pre-industrial) days labour demand in Massachusetts was far from steady. Because of the extremities of the weather, and the frequent breakdown of the fragile transportation system, labour demand often slackened in an unpredictable manner. In spite of this, there is no evidence that unemployment was viewed as a problem. Why? Keyssar's answer is that people could self-insure in a variety of ways. People had many jobs, and could easily shift between them. In times of bad harvests farmers became gunsmiths or carpenters; when the demand for craftsmen was slack, farming got more intense. Moreover, most people owned a piece of land, which helped them to survive in case their cash incomes dried up. Finally, pre-industrial society had a tightly knit social fabric, which in hard times provided some shelter even to those who did not own property.

The process of industrialisation signalled the beginning of “the era of uncertainty.” Between 1820 and 1870 the proportion of the labour force engaged in agriculture declined from nearly 60 percent to a little more than 10 percent. Production got more specialized, household manufacturing disappeared, and the factory system gained prominence. This transformation set the stage for increased standards of living, but it also introduced new disturbances to labour demand. The rapid pace of structural change implied that business failures – which at a moment's notice terminated the flow of cash income of dislocated workers – were common also in good times. There was also the new phenomenon of the business cycle. Beginning in the 1870s the economy was affected by recurring “panics”, which curtailed activity throughout the state. These contractions seem to have got more severe in the 1890s, when technological advances made it possible to produce closer to the market, which obviated the need to produce for inventory.

At the same time that industrialisation added disturbances to the labour demand schedule, it also destroyed the traditional mechanisms of self-insurance. It was no longer easy to shift to farming or household manufacturing when the industrial sector

stagnated. Rapid immigration and population growth meant that a growing share of the labour force lost its ties to the agricultural subsistence sector, and urbanization eroded the social fabric of pre-industrial society. All in all, Keyssar's analysis suggests that unemployment materialized as a problem because industrialization simultaneously created new risks and destroyed the old institutions of risk sharing.

To a modern day economist, accustomed to the idea that rigid institutions are main causes of unemployment, an intriguing aspect of the historical evidence is that it suggests that flexibility is no panacea for unemployment and income risk. By any reasonable standard the labour markets of historical Massachusetts must be characterized as extraordinarily flexible. There were hardly any formal regulations, nominal wage cuts appear to have been common, geographical mobility was high, etc. But in spite of this Keyssar's documentary material indicates that chronically unsteady employment and "involuntary idleness" was perceived as a major problem among large segments of the work force. The available statistical evidence – in the form of federal and state censuses, union surveys, etc. – corroborates this picture. It appears that the average unemployment rate exceeded 15 percent during the depressions of the 1870s and 1890s. For unskilled and semiskilled workers, unemployment rates were in all likelihood much higher. Unemployment also appears to have been a widely shared experience. In the bad years the frequency of unemployment (defined as the percentage of the work force with at least one spell of unemployment during a given year) might have been as high as 40 percent.³

Keyssar's documentation also suggests that many of today's labour market institutions originally developed as a first line of defence against a highly unpredictable labour demand schedule. Towards the close of the 19th century trade unions grew in strength, and one of their most important original functions appears to have been to offer

³ In 1885 an average unemployment spell appears to have been between 4-5 months (Keyssar (1986, p. 91)).

various forms of protection against unemployment and irregular cash income. These protective measures included a host of strategies. A first was to make it easier for the unemployed to find new jobs; for this purpose unions created job information offices, and provided travelling loans to members who were out of work. A second was to ease the financial consequences of unemployment; many unions paid out benefits – or, less ambitiously, gave loans – to their unemployed members. A third way of coping was to promote policies that spread work among as many people as possible during depressions; bans on overtime work, and demands that employers put every union member on ‘short time’ instead of laying off people, belong in this category. Finally, quite early on the principle of layoffs on a “last hired, first fired“ – a principle that most economists of today view as a major cause of inefficiency – basis became an important union strategy to shelter the incomes of more senior workers (who often had a family to support).

In Sweden it is only towards the end of the 19th century that the process of industrialisation took off. Recent work by Jonas Olofsson (1996) indicates however that the unemployment issue in Sweden emerged well before industrialised society, and that the first attempts at designing an unemployment policy in the modern sense of the word took shape already during the 1830s and 1840s. At that time rapid population growth and the commercialisation of agricultural production had turned a growing number of people into day labourers. In 1840 the government’s bill about poor relief acknowledged that these workers were unable – due to no fault of their own – to support themselves in times of bad harvests, when the demand for day labour was slack. As pointed out by Olofsson this was a quite dramatic shift of emphasis. Previously, unemployment had been dealt with as a criminal offence; now, for the first time, involuntary unemployment was identified as a separate cause of poverty, worthy of special public attention. To mitigate

the vulnerability of agricultural workers, the 1840-41 *Riksdag* decided that the unemployed should be provided with public relief works in years of bad harvests.

The second stage in the development of the unemployment issue in Sweden is the late 19th century, when industrialisation and urbanisation brought fundamental changes in the economic and social landscape. Like in Massachusetts this transformation was accompanied by a rapid increase in the strength of unions, and – as far as one can tell – by considerable experimentation with various union strategies to cope with fluctuations in labour demand.⁴ There was also an emerging, and intensifying, political debate about the advantages and disadvantages of social insurance against the risks (disability, sickness, unemployment, etc.) that confronted the industrial workforce. While many of the proponents of compulsory social insurance appear to have got their inspiration from quite concrete observations of the social conditions that accompanied industrialisation, there were also strong impulses from Germany.⁵ The social insurance system created under Otto von Bismarck set a practical example, and the lecturing and writings of people associated with *Verein für Socialpolitik* gave intellectual inspiration.

Certainly, the historical evidence is of an impressionistic nature. All the same, I interpret it as a strong indication that the common rent sharing explanation for the emergence of labour market institutions misses a major part of the story. If anything, the experiences of Massachusetts and Sweden seem to suggest that it is unemployment and income insecurity that – together with workers' risk aversion – created the institutions of the labour market, rather than the other way round. It is also noteworthy that in both

⁴ Like e.g. financial support to unemployed members, demands to sign collective bargaining contracts regulating the termination of employment, and calls on employers to counter recessions by shortening the workweek rather than by laying-off workers. For information about these early activities of Swedish unions, see Casparsson (1966) and Edebalk (1975).

⁵ Olofsson (1996) gives a detailed account of this debate, and traces the relevant sources of inspiration.

countries important pieces of still existing social insurance legislation were introduced during the turbulent years of the 1930s.⁶

But in spite of these similarities, one can hardly argue that current Swedish and U.S. labour market institutions have much in common. There are of course several reasons that may explain why institutions evolve differently in different countries, and why the incentives to create all encompassing labour market institutions appear to have been much stronger in Europe than in the United States. An interesting possibility, clearly suggested by Keyssar's analysis, is that large-scale foreign immigration may explain why the U.S. labour market eventually got such a flexible outlook. The workforce in Massachusetts was – and still is – a heterogeneous one, with sharp boundaries according to country of origin, language, ethnic background, etc. In this environment, characterized by competition and sometimes even open antagonism between ethnic groups, it was much more difficult to build up durable labour market institutions than in a much more homogenous country like Sweden. In section 4, I will explore to what extent indicators of ethnic fractionalisation may help to explain cross-country differences in the structure of labour market institutions.

It is time to sum up. The observation that the origin of modern labour market institutions can be traced to periods of rapid change and modernisation, and to the aftermath of economic crisis, is quite consistent with a social insurance interpretation of the birth of institutions. More generally, the lesson seems to be that people's demand for intervention to mitigate risk can be expected to increase in times of greater uncertainty. As I will return to below, this lesson from the past has potentially important implications for the analysis of the future of European style labour market institutions. But although I have emphasised the

⁶ As noted by Krueger (2000), main features of U.S. protective labour legislation and social insurance – like Social Security, the minimum wage, and unemployment compensation – were established during the Great Depression. In Sweden, unemployment insurance sponsored by the government was introduced in 1934.

demand for social insurance as the prime reason for the emergence of modern labour market institutions, it goes without saying that also rent-seeking played a role. In both Massachusetts and Sweden unions battled to increase wages at the expense of profits. There also appears to have been a fair amount of infighting between different unions, and between employed insiders and unemployed outsiders. Keyssar (1986, pp. 202-11) documents various methods – many of which have a strikingly modern ring – which unions used to protect their turf, and to keep outsiders at bay.

Moreover, it appears that already quite early on vested interests tried to hijack the concept of social insurance. In summing up the state of social insurance in Germany at the close of the nineteenth century, Gustaf Cassel (1900) wrote quite approvingly of a social policy that aimed at protecting the working class. He even went so far so as to argue that social policy, properly executed, was a powerful instrument to *promote* economic progress, and to induce people to accept change.⁷ But he also cautioned his Nordic readership that social policy in Germany had gone astray. In Germany the demand for public assistance had grown “...like mushrooms after a rainy day” (Cassel (1900, p. 386)). According to Cassel every German producer and worker believed that the government had an obligation to protect them from any adverse change in the business climate. As a consequence, German tax and trade policies had become so protectionist that their main function appeared to be to maintain the *status quo*, which of course implied that economic progress was stifled.

⁷ In defending social insurance against the proponents of *laissez faire*, Cassel (1900, pp. 387-388) wrote “...the main point in the defence of this policy must rest in the acknowledgement that the productivity of labour increases in parallel with the social position of the working class. The insight about this relationship is the most optimistic, but at the same time one of the most well-established, results of modern economic research” (my translation). Unfortunately, Cassel did not mention what research he had in mind.

3. An insurance model of redistributive unions

A hallmark of the European labour compact is the strong emphasis on redistribution.

Unions compress the wage structure, and governments redistribute income from high- to low-income earners. Judged against the yardstick of a perfectly competitive equilibrium model these policies are bound to create inefficiencies.⁸ But judged against the yardstick of an economy where private markets offer incomplete insurance against labour income risk matters need not be so bleak.⁹ Thus, the absence of private insurance markets suggests a well-known role for government redistribution policy. By reducing the variance of disposable income a system of redistributive taxes and transfers may improve *ex ante* welfare by providing an insurance effect in addition to the conventional equity and incentive effects; see e.g. Varian (1980) and Eaton and Rosen (1980).

But income redistribution via taxation is not the only way of providing insurance against random labour income. A more direct form of insurance can be provided through labour market institutions – unions, minimum wage laws, unemployment insurance – that narrow the wage distribution. As shown by Agell and Lommerud (1992), under general assumptions the insurance benefits from a small compression of the wage structure will outweigh any costs in terms of unemployment and reduced output. The representative worker is willing to exchange a lower expected wage for a wage structure that offers insurance against uncertainty concerning who-one-will-be in the wage distribution.

To see how institutional wage compression compensates for missing private insurance markets in a setting of idiosyncratic wage risk, and to see how far a social

⁸ See e.g. Siebert (1997) for the view that the appropriate benchmark when discussing European labour markets is a classically clearing labour market. Needless to say, a voluminous empirical and theoretical literature rests on the same assumption. Agell (1999) gives some of the references.

⁹ Here, and in the following, I simply take for granted that the private market is unable to fully accommodate people's demand for human capital related risk sharing. Presumably, the absence of private insurance must have something to do with asymmetric information *ex ante* about workers' characteristics, as well as with the difficulty of implementing and enforcing very long run, even life long, insurance contracts. For a discussion stressing the inability of private insurance to protect against lifetime income risk, see Sinn (1996).

insurance approach can go in explaining why selfish individuals support redistributive wage policy, it is useful to work through a simple example. While the model clearly relies on exaggerated assumptions – luck, rather than effort, is the only thing that matters for people’s occupational careers – it allows us to focus ideas in a simple manner. Consider a labour market that has L workers, and two types of jobs, for simplicity referred to as good (high-paying) and bad (low-paying) ones. Before the labour market opens, everyone knows that one half of the L workers will turn out to have the characteristics required for a good job, while the other half will turn out to have the characteristics required for a bad job. Since each individual supplies one unit of labour, aggregate labour supplies become

$$L_G = L/2 \tag{1}$$

$$L_B = L/2 , \tag{2}$$

where the subscripts are self-explanatory.

The demand side is represented by a competitive production sector, which uses ‘good’ and ‘bad’ workers to produce a single good. To suppress all feedback effects from output markets, I assume that the good is sold at an exogenous price, determined in the international market. Workers of either type can only be gainfully employed on the corresponding type of job. In a competitive market wages for good and bad jobs, w_G and w_B , will then depend on labour supplies shown in (1) and (2), and on firms’ production technology. I summarise this process of competitive wage determination by assuming that

$$w_G = 1 + k \tag{3}$$

$$w_B = 1 - k , \tag{4}$$

where k is a positive constant. From (1) through (4) it follows that the wage bill in the *laissez-faire* economy is simply L , and that we by increasing k may analyse the effects of a mean-preserving increase in wage inequality.

As there is no macroeconomic uncertainty w_G and w_B are known to workers before the labour market opens. However, I do assume that there is idiosyncratic risk: before the labour market opens individuals only know up to a probability distribution whether they will turn out to have the characteristics of a good worker (receiving w_G), or the characteristics of a bad worker (receiving w_B). I allow for individual heterogeneity by assuming that the probability of ending up as a good worker, p_i , may differ between individuals. To conform to the aggregate labour supplies shown in (1) and (2), the average of these probabilities across all individuals must (by the law of large numbers) satisfy the restriction $E(p_i) = 1/2$. Based on this aggregate implication I distinguish between three types of workers; talented ones, for which $p_i > 1/2$; average ones, for which $p_i = 1/2$; and untalented ones, for which $p_i < 1/2$. Finally, I assume that workers have identical utility functions $u(x)$, with $u' > 0$ and $u'' < 0$ (which implies strict risk aversion).

In this environment there will be a strong demand to create institutions that provide insurance against wage risk. Let me start with the well-known case of social insurance via redistributive taxation. Assume that the government relies on a tax system that transforms gross wages into net-of-tax wages according to

$$w_G^n = 1 + kT \tag{3'}$$

$$w_B^n = 1 - kT, \tag{4'}$$

where the tax system is redistributive when $T < 1$. Because there are as many good as bad jobs, the government's budget constraint is satisfied for any value of T .

What will optimal policy look like *ex ante*? Under the assumption that the decisive voter is characterised by probability p_i it is easy to show that T should be set so that the following, classic, insurance condition holds true:

$$\frac{\mathbf{p}_i}{1-\mathbf{p}_i} \frac{u'(1+kT)}{u'(1-kT)} = 1. \quad (5)$$

When the decisive voter coincides with our average worker ($\mathbf{p}_i = 1/2$), redistribution according to (3')-(4') is actuarially fair. She therefore desires full insurance, which implies that T should be set to zero, so that $w_G^n = w_B^n$. When the decisive voter is an untalented worker ($\mathbf{p}_i < 1/2$) this insurance gain is reinforced by an equity effect in the form of an *ex ante* transfer from talented to untalented workers. For this reason untalented workers prefer a policy where T is *less* than zero, so that $w_G^n < w_B^n$.

When the decisive voter is a talented worker ($1 > \mathbf{p}_i > 1/2$) the insurance and equity effects pull in opposite directions. It is easy to show that the likelihood that the former dominates the latter increases with the concavity of the utility function; a sufficiently risk averse worker will support at least some redistributive taxation, even if the implied insurance premium is actuarially unfair. Also, the insurance effect is more likely to dominate the higher is wage inequality in the *laissez-faire* economy. As pre-tax inequality increases, even a talented person will eventually support redistributive taxation to cushion a small downside risk of a very bad outcome. To see this, differentiate (5):

$$\frac{dT^*}{dk} = - \left[\frac{\mathbf{p}_i u''(w_G^n) + (1-\mathbf{p}_i) u''(w_B^n)}{\mathbf{p}_i u''(w_G^n) + (1-\mathbf{p}_i) u''(w_B^n)} \right] \frac{T^*}{k} \equiv - \frac{T^*}{k} \quad (6)$$

Since the optimal tax rate, T^* , is always greater than zero for talented individuals, $dT^*/dk < 0$. Hence, as k increases we eventually reach the region where $T^* < 1$.

In a democratic society T will be determined in a voting process, which reflects the distribution of talent in the population.¹⁰ If the decisive voter is the median one, and if the talent distribution is symmetric around the mean, tax policy will be highly

¹⁰ For a seminal analysis of the determination of social insurance in voting equilibrium, see Wright (1986).

egalitarian. As the median voter then faces a 50 percent chance of landing a bad job, there will be full wage insurance. The reason that the voting process delivers such an extreme outcome is of course that we have so far assumed that redistribution has no disincentive effects. If e.g. labour supply responds adversely to taxation, the median voter would opt for a less comprehensive social insurance policy.

Let us now turn to the insurance that can be provided by an all-encompassing union, which uses its monopoly position in the labour market to flatten the wage structure. An implicit assumption in much of the union literature is that workers form unions because they want to bargain over wages in order to transfer rents from capital owners. Here, we rather assume that there are no rents to divide: the union maximises expected utility, subject to the constraint that every dollar's wage hike for the bad jobs must be matched by a corresponding wage cut for the good jobs. We may think of this assumption as reflecting a situation when firms face some binding (zero) profit constraint, which the union cannot infringe upon. Formally, our all-encompassing union is confined to set wages according to

$$w_G^u = 1 + kW \tag{3''}$$

$$w_B^u = 1 - kW , \tag{4''}$$

where superscript u stands for union, and W is the distribution parameter. When $W < 1$ the union pursues an egalitarian wage policy; when $W = 0$ it sets the same wage for both jobs.

In line with our treatment of the government's decision problem, we assume that the union's objective is to maximise the expected utility of its decisive member, characterised by the talent-probability p_i . In line with the basic monopoly union model, we assume that the union unilaterally determines W , and that firms then determine employment according to their labour demand curves. But when firms are on their labour demand curves, a compression of the wage structure will lead to unemployment for those that hold the bad jobs. We formalise this by defining the employment rate of those that have the

characteristics required for a bad job as $g(W)$. We assume that $g(0) < 1$, $g(1) = 1$, and that $g(W)$ is twice continuously differentiable, with $g' > 0$.

The union's optimisation problem is

$$\max_W \quad p_i u(w_G^u) + (1 - p_i)(g(W)u(w_B^u) + (1 - g(W))u(R)), \quad (7)$$

subject to (3'') and (4''), and where R is an exogenous reservation wage, determined by e.g. the value of leisure. The first-order condition becomes

$$\frac{p_i}{(1 - p_i)g(W)} \frac{u'(1 + kW)}{u'(1 - kW)} = 1 - \frac{e(u(1 - kW) - u(R))}{kW u'(1 - kW)}, \quad (8)$$

where $e \equiv g'(W)W / g(W) > 0$ has the interpretation of an employment elasticity.

It is again helpful to start with the case when the average worker is the decisive union member. Unlike the case of redistributive taxation, the insurance provided by the union stops short of complete equalisation of incomes across states. The last term on the RHS is a correction term relative to first-best insurance. It implies a larger deviation from full wage compression the harsher the consequences of unemployment (represented by the utility loss $u(1 - kW) - u(R)$), and the larger the increase in unemployment (represented by the employment elasticity) following a marginal compression of wages.

A crucial question is under what conditions the average worker wants to implement a policy of wage levelling (i.e. set $W < 1$). The intuitive answer is that he wants the union to pursue egalitarian wage policy as long as the reservation wage R is close to the *laissez-faire* wage for the bad jobs, $w_B = 1 - k$. Starting in a situation when $R = w_B$ the insurance gain from a marginal compression of the wage structure will be of first-order importance, while the unemployment cost will be of second-order importance.¹¹ By continuity, the average worker continues to support pay compression even as we reduce R

marginally below w_B . Furthermore, denoting optimal wage policy by W^* , it is not difficult to show that $dW^*/dR < 0$; i.e. an increase in the reservation wage induces the union to purchase additional insurance through pay compression. Treating e as a constant, it is also easy to show that $dW^*/de > 0$; i.e. by increasing the marginal unemployment cost of redistributive wage policy a higher value of the employment elasticity implies that wage policy becomes less redistributive.

The analysis for the other types of workers parallels the case of redistributive taxation. Wage compression creates an *ex ante* equity effect, which benefits untalented workers at the expense of talented workers. For this reason, untalented workers support a more egalitarian wage policy than the average worker, while talented workers may oppose pay compression altogether. Again, it follows that the incentive of a talented worker to support egalitarian policy is an increasing function of wage inequality in the laissez-faire equilibrium. If we differentiate (8), assuming for simplicity that e is a constant, we obtain:

$$\frac{dW^*}{dk} = - \left[1 - \frac{e p_i u'(w_G^u)}{e p_i u'(w_G^u) + \Delta} \right] \frac{W^*}{k} < 0, \quad (9)$$

where the sign follows from the fact that $W^* > 0$ for a talented worker, and that

$$\Delta = e(1 - p_i)g(u(w_B^u) - u(R) + kWu'(w_B^u)) - k^2W^2(p_i u''(w_G^u) + (1 - p_i)g u''(w_B^u)) > 0. \text{ Thus,}$$

comparing two risk averse, talented individuals characterised by the same probability of acquiring a good job, the one who lives in the economy with the largest competitive wage differential will be the one most likely to support redistributive wage policy.

Ultimately, the union's wage policy will depend on the process used to weigh the utilities of different categories of members. Presumably, this process is a great deal more complicated than what is predicted by a median voter approach, according to which

¹¹ Assume that $R = w_B$. Evaluating (8) when $W = 1$, it follows that the RHS is greater than the LHS; when

the union member with the median talent-probability will be the decisive one. A theory of redistributive unions must account for the fact that dissatisfied union members have an exit-option. Talented workers finding that wage policy has become too redistributive may simply leave the union, and create a new (more homogeneous) union of their own. To properly study this issue one would need to address difficult problems concerning coalition formation in a union setting – issues that are well beyond my present purpose.¹²

In this simple model a redistributive union is indeed responsible for creating unemployment, but in spite of this expected utility of the average worker – who reaps an actuarially fair insurance benefit – will be higher than in a *laissez-faire* equilibrium with no unemployment. A redistributive government, however, does a still better job, since it provides insurance, without the unemployment that follows from the union's interference with relative factor prices. For the average worker, the three equilibria can thus be ranked as follows: a redistributive government reaches the first best, a redistributive union the second best, and the unregulated market the third best.

The model also has implications for the positive analysis of labour market institutions. First, it suggests that the demand for risk sharing institutions ought to increase with the fraction of the workforce that faces uncertainty about their future position in the wage distribution. It also indicates that redistributive tax or wage policy will have the widest support in economies where workers are relatively homogeneous, in the sense that they face similar uncertainties concerning their future labour income. In practice, and in line with our historical evidence, one would perhaps expect that the insurance demand for a narrow wage distribution is the strongest in times of rapid structural change, or in periods of macroeconomic turmoil, when established economic relations are disrupted. Under those

$W = 0$, it follows that the RHS is less than the LHS. Thus, optimal W is in the open interval $(0, 1)$.

circumstances, one would expect that a larger share of the work force needs insurance against a rainy day. As a consequence, union members may then vote for a more egalitarian wage policy, while the electorate at large may vote for more redistributive taxation.

Second, our analysis suggests that the incentive to create union-sponsored institutions of risk sharing decreases with the extent of the social safety net provided by the government. In the presence of a redistributive tax system that internalises the demand for social insurance workers have no reason to join a redistributive union. But if the government scales down social insurance, workers get an incentive to form a redistributive union. To the extent that redistributive wage policy is more socially costly than redistributive taxation (and in our model this is certainly the case), a weakening of the public safety net may simply imply that a less efficient instrument of social insurance replaces a more efficient one. In an interesting recent paper, Avi-Yonah (2000) makes the related point that by weakening social insurance, tax competition may unleash widespread popular demand for protectionist, and potentially quite harmful, trade policies.¹³

Finally, there is the question of Cassel (1900) of whether social insurance can be designed in a way that encourages people to accept change, and to undertake risky activities. Sinn (1995) is one of the few who have studied this issue formally. He extends the model of redistributive taxation to the case when individuals can affect their income risk through their own actions, and he shows that the insurance provided by redistributive taxation may well enhance risk-taking. Sinn concludes that "...under the protection of the welfare state more can be dared." Our model has a similar interpretation. We may think of our bad and good jobs as being situated in a particular sector of the economy, or in a

¹² Another problem is due to the fact that any social insurance contract is susceptible to an intrinsic time consistency problem. *Ex post*, lucky workers have an incentive to renege on *ex ante* efficient wage contracts. For a discussion of these issues, see Burda (1995).

¹³ Political scientists have for long suggested that there might be an inverse relation between the extent of social protection provided by the welfare state and the tranquillity of a country's labour market relations; see Hibbs (1978) for an analysis along this line.

particular occupation. In a laissez-faire equilibrium, a risk averse individual's decision to enter this particular sector, or occupation, will be adversely affected by the uncertainty concerning her place in the intra-sectoral, or intra-occupational, wage distribution. In either case, redistributive taxation or wage policy may – by reducing uncertainty – encourage people to take on the risk of entering the sector, or occupation, in question.

4. The cross-country evidence

In what direction will European labour markets develop in the future? According to the conventional view, increased openness and the requirements imposed by the new economy are bound to increase the costs of preserving institutions that hinder the flexible adjustment of relative wages. As a consequence governments' sooner or later have to liberalise rigid labour market institutions, cut down on generous unemployment insurance, and implement measures that restrict the influence of rent-seeking unions. But considerations of political economy suggest that this process is not automatic.

Figure 1 shows the marginal costs and benefits of redistributive tax or wage policy, as perceived by the decisive voter, or by the decisive union member. Under the standard assumption that the excess burden increases with the square of the tax wedge the marginal cost curve slopes upwards. Under the seemingly plausible assumption that a dollar's worth of income redistribution matters most at a low overall level of income redistribution, the marginal benefit curve slopes downwards. In the initial political economy equilibrium, the decisive voter chooses the amount of redistribution so that the marginal cost and benefit curves intersect, i.e. point *A*.

The popular view assumes that globalisation increases the efficiency costs associated with a given level of income redistribution; i.e. the marginal cost curve shifts upwards. We then end up in the political economy equilibrium at point *B*, where the new

cost curve intersects the old benefit curve. Clearly, there is less income redistribution in the new equilibrium. But to the extent that globalisation for some reason also increases the decisive voter's demand for social insurance, there will in fact be a simultaneous upward shift in the marginal benefit curve. As a consequence we may end up at point like *C*, where the new cost curve intersects the new benefit curve. Whether this final political equilibrium is associated with less or more income redistribution is clearly an open question, on which it is hard to form a very definite *a priori* opinion.

The cross-country evidence on the determinants of labour market institutions suggests that the analysis of Figure 1 is more than a theoretical peculiarity. Researchers have long suggested that the vulnerability of the open economy provide strong incentives to increase the scope of government. In an early study, Cameron (1978) showed that the trade to GDP ratio in 1960 was a good predictor of the growth of public revenue in a sample of 18 OECD countries in the period 1960-75. He also found a positive correlation between openness and a measure of the scope of collective bargaining. Cameron suggested that this correlation was due to the fact that trade was accompanied by a high degree of industrial concentration, which facilitated the formation of employers' associations and strong unions. More recently, Rodrik (1998) has found evidence of a robust positive correlation between openness and indicators of the size of government in a much larger sample. The explanation offered by Rodrik is that government spending plays a risk-reducing role in economies exposed to a significant amount of external risk. In Agell (1999) I show plots suggesting that more open economies on average tend to have higher union density, more centralised wage setting, more compressed wage structures, higher minimum wages, etc.

4.1. Benchmark regressions

Here, I report new results on the determinants of labour market institutions for those countries for which there exists comparative data on aggregate labour market characteristics, i.e. the members of the OECD. The benchmark least squares regressions are presented in Table 1. The dependent variables reflect a variety of often-discussed dimensions of labour markets and social security systems.¹⁴ Columns 1 and 2 regress the net replacement rates for long- and short-term recipients against the independent variables. These replacement rates are taken from OECD (1999a), and they show the combined impact of benefits, income taxes and various social welfare benefits for prototype families in 26 OECD countries during the second half of the 1990s. The aggregate numbers I use in the regressions are simple arithmetic averages across prototype families (who have in common that the principal earner is an “average production worker”). According to these aggregates, long-term recipients are most generously treated in Denmark, Iceland, the Netherlands, and Sweden (in these countries the net replacement rates exceed 70 percent), and the least generously treated in Greece (a replacement rate of 2 percent), the USA (27 percent), and Korea (29 percent).

Columns 3 to 10 show regressions where the dependent variable is taken from Nickell and Layard (1999), who provide comparable information on labour market institutions in 20 OECD countries. These variables – which quantify the strictness of job security legislation, union density, the degree of coordination of wage bargaining, spending on active labour market policy, etc. – refer to the situation in the 1989-94 period. Finally, column 11 shows a regression for a measure of income inequality, the 90/10 percentile ratio of disposable income inequality. According to this measure – taken from Gottschalk and Smeeding (1997), and available for 17 countries – Finland, Sweden, Belgium, and

¹⁴ See the Appendix for a complete discussion of data and data sources.

Norway are the least unequal countries (with 90/10 ratios below 3), while the USA and the UK are the most unequal ones (the US 90/10 ratio is 5.8, and the British one 4.7).

The small sample size means that there is no room for the joint inclusion of a great number of explanatory variables. My benchmark specification includes three independent variables, the log of openness, the log of GDP per capita, and a measure of linguistic fractionalisation. Both openness, defined as the sum of exports and imports over GDP, and per capita GDP are taken from the Penn World Tables, mark 5.6. To reduce problems of endogeneity openness and per capita GDP are measured in a period that precedes the measurement of labour market institutions.¹⁵ Linguistic fractionalisation is a variable that I have taken from the data set of Easterly and Levine (1997). It is an average value of five different indices, compiled by linguistic scholars, which all try to measure a country's linguistic diversity. The summary measure that I use has a minimum of 0, which indicates a country where everyone has the same language, and a maximum of 1, which indicates a country where everyone has her own language. Table 2 shows the extent of linguistic fractionalisation among the OECD countries according to this index.

The linguistic variable deserves some comment. Both the historical evidence and theoretical considerations suggest that countries with a more homogeneous work force are more prone to build up labour market structures that are organised along collective lines. In a country with a more polarised population – in terms of preferences, the distribution of abilities, etc. – it is more difficult to form and maintain all-encompassing institutions. One might also expect that more polarised societies devote less resources to the consumption of public¹⁶ goods, of which social insurance might be a good example. To quantify the extent of homogeneity of a society, political scientists have for long relied on

¹⁵ In columns 1 and 2 openness and per capita GDP are measured in 1990, and in the remaining columns they are measured in 1985.

¹⁶ For theory and evidence on this, see Alesina, Baqir and Easterly (1999).

measures of linguistic fractionalisation. More recently, these measures have been introduced in the political economy literature; see Mauro (1995), Easterly and Levine (1997), and Alesina and Wacziarg (1998).

The benchmark regressions of Table 1 are not easy to reconcile with the view that increased international economic integration will undermine the European labour market compact. Not a single one of the eleven estimated coefficients on log Openness has the sign one would expect if international trade really was to weaken the labour compact. If anything, the relation appears to be of the opposite sign. After controlling for initial GDP and linguistic fractionalisation, Log Openness is positively correlated with (i) the generosity of social insurance (columns 1 and 2), (ii) strictness of labour standards and job protection (columns 3 and 4), (iii) the strength and centralisation of labour market organisations, and the coordination of wage bargaining (columns 5-8), (iv) level of minimum wages (column 9), and the amount of resources invested in active labour market policies (column 10). Finally, the coefficient reported in column 11 indicates that open economies have a more compressed distribution of disposable income. Seven of these eleven coefficients are significant on the five or one percent levels.

The linguistic fractionalisation index is also statistically significant at conventional levels in seven of the estimated equations. Interestingly, and in line with the predictions from theory and comparative social history, Linguistic fractionalisation is negatively correlated with all the four variables that measure the strength, centralisation, and coordination among the parties of the labour market (see columns 5-8). The economic significance of Linguistic fractionalisation is illustrated by the case of Belgium, a quite open economy, which also happens to have a high rank on the fractionalisation index. The point estimates of column 5 indicates that if Belgium had the Swedish index-value of .065

instead of its actual value of .364, its union density rate would have been 63.5 percent, which can be compared with Belgium's actual union density rate of 51 percent.

Finally, columns 1, 2, and 9 suggest that log GDP/capita is significantly and positively correlated with both the long- and short-run replacement rates, and with the level of the minimum wage. One way to think of these correlations is in terms of Wagner's law: if the demand for social security is income elastic high-income nations ought to have more generous systems of maintaining people's income.¹⁷

4.2 Sensitivity analysis: "natural" openness, country size, and outliers

There are clearly several reasons to be cautious about the results reported in Table 1. My sample is small. I have left out potential explanatory variables. There is reason to worry about outliers. There are problems of measurement error, and with the endogeneity of my explanatory variables. In this section I will address these issues. As we shall see, it is certainly possible to come up with alternative specifications that "kill" some of the significant results of Table 1. However, it is noteworthy that in *none* of these new specifications do we obtain results suggesting that there is a negative association between openness and our indicators of institutional involvement in the labour market.

A potentially important issue is reverse causation. Our measure of openness is based on the actual volume of trade, which is an endogenous variable that can be affected by country-specific labour market institutions. To examine whether the correlations of Table 1 suffer from endogeneity bias, Table 3 shows the results when we replace the log of the actual trade share with the log of the constructed trade share of Frankel and Romer (1999). As their constructed trade share ("natural openness") is based on geographic factors (like a country's area in square meters, distance to other countries, whether it is

¹⁷ The correlations with log GDP/capita reported in some of the other columns are harder to interpret.

landlocked), it can be interpreted as a measure of a country's exogenous trade. Clearly, there is no indication that the results of Table 1 are driven by reverse causation. The coefficient on openness has the same signs in both Table 1 and Table 3, and the significance levels are generally more reassuring in the latter one ("natural openness" is significant at the conventional level in ten of the estimated equations in Table 3).

Some authors have suggested that country size may have an independent effect on the incentive to form institutions. To the extent that there are important fixed costs linked to the creation of institutions, countries with a large population may devote a smaller share of their resources to common institutions. For this reason, it has been argued that populous countries have a smaller public sector relative to GDP; see Alesina and Wacziarg (1997). It has also been argued that union density will be lower in countries with a large labour market; see Wallerstein (1989). But since a country's trade share is correlated with its size, our finding of a non-negative association between openness and institutional involvement could simply be a spurious one, due to the fact that our benchmark specification omits a measure of country size.

To address this issue, I have run regressions where I have added (the log of) population size to the explanatory variables shown in Table 1. This modification does *not* change the sign of any of the eleven estimated coefficients on log Openness. But it does weaken the statistical significance of openness, which remains statistically significant in only two of the estimated equations. The size variable, in turn, is only statistically significant in one of the estimated equations. Since log Openness and log Population are highly correlated, it is difficult to estimate their coefficients with any precision. Because the degree of collinearity between population size and the Frankel-Romer instrument of

exogenous trade is less high,¹⁸ I obtain more precise estimates when I add log Population to the explanatory variables of Table 3. As shown in Table 4, the sign of the openness coefficient remains unchanged, and it is significant at conventional levels in six regressions. The sign of the coefficient on the size variable has no clear pattern, and it is significant at the conventional level in four regressions. Hence, I conclude that my finding of a non-negative relation between openness and institutional involvement in the labour market is not due to inappropriate omission of a measure of country size.

As a final sensitivity test, I have explored to what extent the results are driven by observations for the USA, a potential outlier in cross-country comparisons of institutional design. To address this issue, I simply added a US-specific dummy variable to each of the regressions reported in Tables 1, 3 and 4. It turned out that this modification, did not change the sign of any of the 33 coefficients on log Openness. Moreover, 20 of these coefficients remained significant at the ten percent level, or more.

Finally, it should be noted that as I bring in additional explanatory variables, linguistic fractionalisation loses some of its explanatory power. However, in both Tables 3 and 4, linguistic fractionalisation remains – very much in line with the theoretical prediction – a potentially important determinant of the variables that measure the strength, centralisation, and coordination among the parties of the labour market.

5. What about the new economy?

To the extent that cross-country regressions are at all informative about the future the surprising message seems to be that there is little reason to suppose that increased international economic integration will weaken the institutions of the labour market. What

¹⁸ When I regress log Openness measured by the actual trade share against log Population and a constant (for the twenty countries that constitute the sample of Nickell and Layard (1999)), I obtain an adjusted R^2 of .52. When I repeat the same exercise for the measure of natural openness, I obtain an adjusted R^2 of .32.

about the labour market implications of the new economy? In the popular debate it is common to argue that the computerised economy will join forces with globalisation in an assault on redistributive labour market institutions. However, the simple framework of Figure 1 again serves to remind us that there are both costs and benefits associated with these institutions.

As was the case with globalisation, it is probably true to that new technology tends to increase the costs of certain labour market institutions; i.e. the marginal cost curve shifts upwards, which tends to reduce the amount of redistribution demanded by the decisive voter/union member. But at the same time one cannot rule out that computerisation also leads to an upward shift in the marginal benefit curve, which tends to increase the amount of redistribution. Times of rapid technological innovation are also times when old skills erode rapidly, and when investments in human capital depreciate at a higher – and probably more erratic – rate. Therefore, one might conjecture that the demand for institutions that protect people's returns from human capital increases in periods of technological breakthroughs – of which the new economy is a good example.

It is true that this unconventional prediction does not appear to fit the facts. Those sectors of the economy that so far have been the most affected by computerisation and the web are also to the ones where labour market relations appear to be the most flexible, in terms of compensation methods, incidence of individual bargaining, work hours, etc. But in my view, it is premature to say anything definite about the labour market implications of the new economy until this sector has lived through its first major crisis. After all, in Massachusetts and Sweden it was the industrial “panic” of the late 19th century, rather than industrialisation *per se*, that provided important impulses to create labour market institutions.

6. Conclusions

The conventional wisdom about rigid European labour markets is probably right in concluding that redistributive unions and governments can be held responsible for creating quite tangible efficiency losses. But a complete analysis should also recognise that the very same policies create substantial (but harder to quantify) insurance benefits. In this paper, I have argued that this is indeed the message conveyed from comparative social history, conventional neo-classical theory, and simple cross-country regressions.

But why insurance via unions or governments? If labour market risk really is an important factor in life, firms and employees have strong incentives to take care of this on their own, writing individualised insurance contracts. Indeed, a key idea in the large literature on “implicit contract” models of wage and employment determination is that risk averse workers strike efficient wage bargains with their firms. However, the very same problems of implementation and enforcement that may help to explain why private insurance against long term career risks is virtually absent also explain why such implicit insurance contracts are not likely to be available.¹⁹ By contrast, most of these problems are mitigated in economies with European style – collectively organised – labour market institutions. By providing a standardised insurance package the costs of devising and monitoring a potentially very large number of individualised worker-firm contracts are avoided. Also, with universal coverage problems of adverse selection get less significant.

Even so, it seems clear that Gustaf Cassel’s verdict about social protection towards the end of the 19th century is as applicable today: while the theory might be fine, the concrete policies appear to leave something to be desired. Even supporters of social insurance must admit that many of today’s policies, in the labour market and elsewhere, are

designed in ways that prevent change, and preserve the *status quo*. Cassel held the optimistic view that as long as one first carefully assessed the “direction of technological and economic advances,” social protection could actually be designed so as to encourage the same advances. A hundred years later, the complete solution to this problem of optimal institutional design remains to be worked out. But recognising that the job is a difficult one is not the same thing as saying that it cannot be done.

¹⁹ While the literature on implicit contracts focuses on uncertainty in the form of an aggregate shock to a whole industry, my concern is intrinsic uncertainty concerning people’s ability in the distant future. For an interesting analysis of how labour market integration affects labour market institutions in a setting of implicit contracts, see Schöb and Wildasin (1998).

Appendix

The data sources for the dependent variables used in section 4 are as follows. The short- and long-run net replacement rates used in columns 1 and 2 of Tables 1, 3, and 4 are from the OECD (1999a), Tables 3.2 and 3.5. To arrive at two aggregate replacement rates for each country, I have computed the arithmetic average for the different family types reported in columns 1-4 in each of these tables. Although net replacement rates are available for 26 countries, I exclude the Czech Republic from my regressions, the reason being that there is no information about linguistic fractionalisation in this country.

The dependent variables used in columns 3-10 come from Nickell and Layard (1999), NL, and they are available for 20 countries: Austria, Belgium, Denmark, Finland, France, Germany, Ireland, Italy, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, the United Kingdom, Canada, the United States, Japan, Australia, and New Zealand. The variables Labour standards and Job protection rank are from NL, Table 6. Union density, Union coordination, Employer coordination, and Centralisation rank are from NL, Table 7. The variable Centralisation rank is taken from Calmfors and Driffill (1988). In its original form this ranking (which goes from 1 to 17) is constructed so that a lower rank signifies that the wage bargain is more centralised. Before I ran my regressions, however, I multiplied the Calmfors-Driffill ranking with -1 , so that a more centralised wage bargain becomes associated with a higher rank. The variable Minimum to average wage is from NL, Table 9, supplemented with information for Switzerland from Dolado *et al.* (1996), Table 1. There are missing values for Japan and Australia. The variable Active labour market policy is from NL, Table 10.

The 90/10 percentile ratio of disposable income inequality in column 11 is taken from Gottschalk and Smeeding (1997), Figure 2. For most countries income

inequality is measured in 1991-92. Compared with the 20 countries included in the data set of NL, there are missing values for Japan, New Zealand, and Portugal.

The independent variables are from the following sources. Population, Openness (defined as the sum of actual imports and exports over GDP), and GDP per capita (in purchasing power parities) are from the Penn World Tables, Mark 5.6. These variables are measured in 1985 (columns 3-11 of my tables) or 1990 (columns 1 and 2). The constructed openness measure (defined as the sum of constructed imports and exports over GDP) used in Tables 3 and 4 is from Frankel and Romer (1999), Table A1. The index of linguistic fractionalisation is computed as an arithmetic average of five different indices of linguistic diversity, included in the data set of Easterly and Levine (1997).

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Figure 1. Effect of globalisation on redistribution in political economy equilibrium

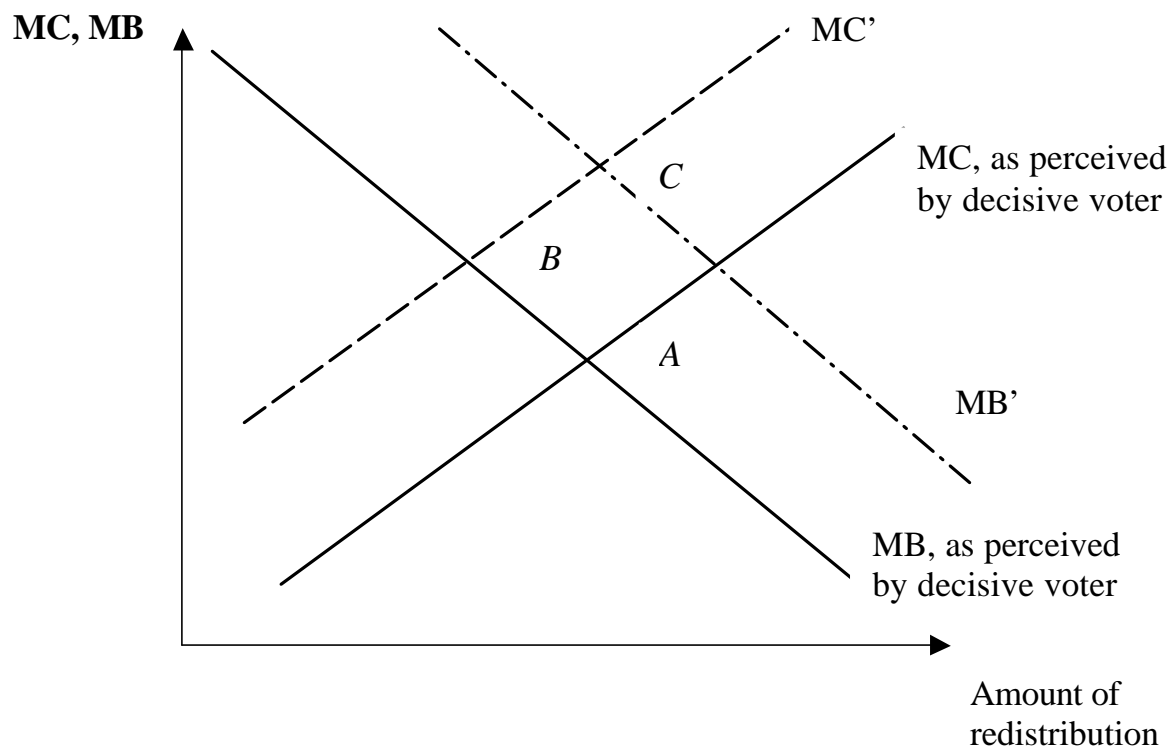


Table 1. Cross-country evidence on the determinants of labour market institutions

EXPLANATORY VARIABLES	DEPENDENT VARIABLES										
	Net replacement rate, short-run (1)	Net replacement rate, long-run (2)	Labour standards (3)	Job protection rank (4)	Union density (5)	Union coordination (6)	Employer coordination (7)	Centralisation rank (8)	Minimum to average wage (9)	Active labour market policy (10)	Disposable income inequality (11)
Constant	-100.210 (55.303)	-249.452 (97.302)	10.024 (22.919)	107.357* (38.887)	-299.491* (107.350)	-5.197 (6.850)	-14.752* (5.606)	-84.528 (39.950)	-1.206* (.419)	-90.764 (107.238)	17.300 (9.760)
Log GDP/capita	14.172* (5.579)	26.452* (9.817)	-1.180 (2.213)	-11.241** (3.822)	27.932* (9.611)	0.627 (0.674)	1.482* (.571)	5.943 (3.840)	0.138** (.034)	8.069 (10.541)	-.957 (1.018)
Log Openness	7.857* (3.857)	14.723** (4.920)	1.281 (0.956)	2.098 (1.964)	21.259** (7.169)	0.412 (0.290)	.822** (.256)	5.524** (1.620)	.118* (.040)	7.730 (4.146)	-1.225** (.368)
Linguistic fraction.	2.268 (22.688)	-45.000* (18.184)	-2.397 (4.417)	-3.069 (9.864)	-66.828* (27.264)	-3.537* (1.409)	-3.707** (1.130)	-23.739* (8.610)	-0.447* (.179)	-32.061 (21.298)	2.006* (.837)
Adjusted R ²	.242	.438	.004	.277	.261	.216	.323	.472	.418	-.008	.433
Number of countries	25	25	20	20	20	20	20	20	18	20	17

* denotes significance at five percent level

** denotes significance at one percent level.

Notes: White-robust standard errors are shown in parentheses. For a description of the variables, see main text and the Appendix.

Table 2. Linguistic fractionalisation rank of 25 OECD countries

	Linguistic fractionalisation index (Easterly-Levine (1997) summary measure)
Canada	.376
Belgium	.364
Switzerland	.308
Spain	.275
Luxembourg	.217
United States	.209
New Zealand	.148
France	.145
Australia	.113
United Kingdom	.106
Finland	.105
Ireland	.090
Greece	.078
Norway	.070
Hungary	.065
Sweden	.065
Netherlands	.063
Germany	.044
Poland	.039
Italy	.039
Austria	.033
Denmark	.028
Japan	.010
Portugal	.003
Korea	.000

Table 3. Exogenous measure of ‘natural’ openness (Frankel and Romer (1999))

EXPLANATORY VARIABLES	DEPENDENT VARIABLES										
	Net replacement rate, short-run (1)	Net replacement rate, long-run (2)	Labour standards (3)	Job protection rank (4)	Union density (5)	Union coordination (6)	Employer coordination (7)	Centralisation rank (8)	Minimum to average wage (9)	Active labour market policy (10)	Disposable income inequality (11)
Constant	-83.084 (50.680)	-209.791* (91.547)	11.195 (18.096)	99.158* (34.530)	-204.608 (104.414)	-4.928 (5.878)	-14.455* (6.034)	-67.505* (28.086)	-.899* (.368)	-61.817 (95.098)	17.129* (7.758)
Log GDP/capita	14.186* (5.421)	26.174* (9.720)	-1.067 (1.900)	-10.257* (3.599)	23.841* (10.917)	.672 (.617)	1.591* (.627)	5.483 (2.882)	.130** (.038)	7.021 (10.152)	-1.211 (.811)
Log Openness	4.845** (1.112)	7.410* (3.346)	1.060* (.045)	2.688* (1.000)	10.502* (4.387)	.351* (.150)	.723** (.125)	3.446** (.953)	.085** (.019)	4.341 (2.147)	-.843** (.208)
Linguistic fraction.	6.970 (20.403)	-35.587* (17.087)	-1.366 (4.060)	-1.110 (8.714)	-51.706 (31.238)	-3.202* (1.240)	-3.033** (.711)	-19.607* (7.386)	-.347 (.168)	-26.415 (19.961)	1.054 (1.002)
Adjusted R ²	.280	.332	.082	.393	.150	.300	.590	.486	.517	-.026	.549
Number of countries	25	25	20	20	20	20	20	20	18	20	17

* denotes significance at five percent level

** denotes significance at one percent level.

Notes: White-robust standard errors are shown in parentheses. For a description of the variables, see main text and the Appendix. Log Openness is here defined as the log of the constructed trade share, taken from Frankel and Romer (1999), Table A1.

Table 4. Natural openness versus country size

EXPLANATORY VARIABLES	DEPENDENT VARIABLES										
	Net replacement rate, short-run (1)	Net replacement rate, long-run (2)	Labour standards (3)	Job protection rank (4)	Union density (5)	Union coordination (6)	Employer coordination (7)	Centralisation rank (8)	Minimum to average wage (9)	Active labour market policy (10)	Disposable income inequality (11)
Constant	-84.137 (65.435)	-146.148 (97.970)	9.773 (17.474)	71.227* (26.921)	-75.532 (80.444)	-4.669 (6.211)	-14.620* (6.794)	-52.576 (31.589)	-.952* (.373)	-49.309 (89.198)	15.111 (10.210)
Log GDP/capita	14.216* (5.727)	24.460* (9.940)	-1.069 (1.920)	-10.303** (2.887)	24.057** (8.129)	.672 (.642)	1.590* (.648)	5.508 (3.350)	.130** (.041)	7.042 (10.418)	-1.140 (.961)
Log Openness	4.922 (2.630)	2.791 (3.478)	1.169* (0.455)	4.822** (1.046)	.641 (5.053)	.331 (.193)	.736** (.176)	2.306* (.874)	.089** (.021)	3.386 (2.587)	-.733** (.199)
Linguistic fraction.	6.964 (20.912)	-35.209 (18.540)	-1.334 (4.165)	-.493 (6.845)	-54.560 (30.957)	-3.208* (1.300)	-3.030** (.727)	-19.937* (8.201)	-.347 (.171)	-26.691 (20.913)	1.036 (1.052)
Log Population	.059 (1.976)	-3.571* (1.351)	.117 (.459)	2.306* (.817)	-10.655** (2.830)	-.021 (.139)	.014 (.122)	-1.232* (.521)	.005 (.019)	-1.033 (2.068)	.107 (.172)
Adjusted R ²	.244	.352	.024	.550	.470	.255	.563	.540	.483	-.085	.529
Number of countries	25	25	20	20	20	20	20	20	18	20	17

* denotes significance at five percent level

** denotes significance at one percent level.

Notes: White-robust standard errors are shown in parentheses. For a description of the variables, see main text and the Appendix. Log Openness is here defined as the log of the constructed trade share, taken from Frankel and Romer (1999), Table A1.