Distribution, efficiency, and labor market regulation: Theory, OECD, Latin America

Giuseppe Bertola*
(Università di Torino, CEPR, EUI)

First draft October 14, 2003, preliminary.

Abstract

This paper reviews theories and evidence on the motivation and effects of labor market institutions such as collective wage bargaining, unemployment insurance, and employment protection legislation. Financial market access for consumer-workers plays a crucial role in theory, and on the basis of OECD evidence, in determining the economic desirability and political sustainability of interference with laissez-faire labor market outcomes. This perspective is arguably very relevant to the evaluation of labor market institutions in Latin America, and in other countries engaged in an uneven process of international opening and internal market-oriented reforms.

*Prepared for the 7th Annual Conference, Central Bank of Chile, Santiago 6-7 November 2003.

1 Introduction

In a perfect world, labor markets would not be regulated. Competition, rather than union contracts or legislation, would determine wages at a level consistent with full employment. Only technological obstacles would prevent labor reallocation towards the most productive jobs and occupations. No subsidies would be paid to unemployed workers, and no taxes would be imposed on employment relationships.

The world we live in is not perfect, and the market for labor services is more heavily regulated than most others. The extent to which labor market institutions interfere with laissez faire determination of employment and wage outcomes is very different across countries, and also exhibits some variation over time. Relating labor market outcomes to institutional indicators (from payroll taxes financing unemployment and social security benefits, to minimum wage and collective bargaining provision, to job security legislation) in cross-country and panel data sets has made it possible for empirical analysis of data from different institutional environments to assess the implications of various policy interventions for aggregate and disaggregated employment and unemployment rates, for wage inequality, and for macroeconomic trends and cycles.

To understand why policy aims at distorting labor market outcomes, it is important to consider institutions' effects on distribution and allocation in a second-best environment. Policies that would be clearly inefficient in a hypothetical representative-agent/perfect-markets situation can appeal to workers' representatives because they make it possible for their constituents to earn a larger share of aggregate welfare. From this perspective, the pros and cons of labor market institutional arrangements depend on deeper structural and political features of different economies:

- The strength of incentives to introduce thusly motivated legislation and other collective action depends not only on the relative efficiency of market and policy mechanisms, but also on the extent to which labor interests are distinct from employer interests, which in turn depends on the character of financial and other market imperfections preventing workers from internalizing profitability losses.
- The effectiveness of labor market regulation in shifting welfare towards workers depends on the extent to which employers may flexibly adjust on other margins, which in turn reflects, among other things, an economy's degree of openness to international trade and factor flows.
- When the interests of different individuals differ, the extent to which each may influence institutional arrangements depends on their numbers and political power, which in turn depends on a country's social and political structure.

In explaining and interpreting the motivation of institutional arrangements in the labor market, the literature has not made as much progress as in understanding their implications as exogenous determinants of labor market outcomes.[1] Efforts in the former

[1] See Bertola (2002) for a framework focused on the first of these channels, Bertola and Boeri (2002) for a discussion of the second channel in the presence of international integration processes, and especially Saint Paul (2000) for wide-ranging analysis of the politico-economic channel with special emphasis on redistributive tensions across categories of workers.

direction are difficult, but increasingly necessary when research begins to study labor market institutions in increasingly different countries, as done by Heckman and Pages (2004). If the structural characteristics of the static and dynamic problems faced by countries (or markets, or indeed individuals) in the sample are highly heterogeneous, it is obviously harder to disentagle the implications of such characteristics from those of institutional constraints—which may in turn be endogenously motivated by the structure itself.

This paper offers a simple formalization of the relevant interaction channels, which are intuitively clear but difficult to make precise and empirically insightful, and discusses their applicability in to OECD and Latin American realities. Section 2 outlines a very simple framework for labor market analysis, illustrating sources of production and welfare inefficiencies, and Section 3 discusses how institutional interferences with *laissez faire* in labor markets bear on labor allocation. The formal framework used to illustrate the relevant insights is a simple explicit version of models analyzed by Bertola (2002) and other theoretical contributions; an Appendix collects mathematical derivations.

Section 4 discusses how disaggregated evidence from OECD countries can be interpreted from the resulting theoretical perspective. Section 5 offers an illustrative empirical exercise on simple available indicators, finding that basic insights from OECD countries more than a decade ago are also applicable to Latin American countries, and concludes outlining new challenges and opportunities in empirical analysis of countries that regulate their labor markets heavily but differ in important respects from OECD members, and lack comparable statistics regarding disaggregated labor market outcomes.

2 A simple perspective on labor markets

The following discussion is centered on a basic tool of labor economics: the negative relationship between employment and wage levels represented by a standard labor demand function. The Appendix specifies a constant-elasticity specification for that relationship, and considers the possibility of multiplicative shifts in the level of wages consistent with any given level of employment. Specifically, the market features both "good" jobs, where productivity is higher, and "bad" ones, with relatively low productivity. Workers may also not be employed, in which case they enjoy an exogenous constant income-equivalent flow of utility.

2.1 Perfect markets

Consider first a statically efficient configuration of this labor market, which features only two endogenous variables: the overall level of employment, and the fraction of that employment allocated to high-productivity jobs. As shown in Figure 1, and derived formally in the Appendix, the wage accruing to employed workers depends on the fraction of high-productivity employment, which in equilibrium is such as to equalize wages across all employment opportunities if mobility among them is costless. And the overall level of employment must be such as to equalize that single wage to the income-equivalent flow of non-employment. This employment allocation maximizes production, inclusive of

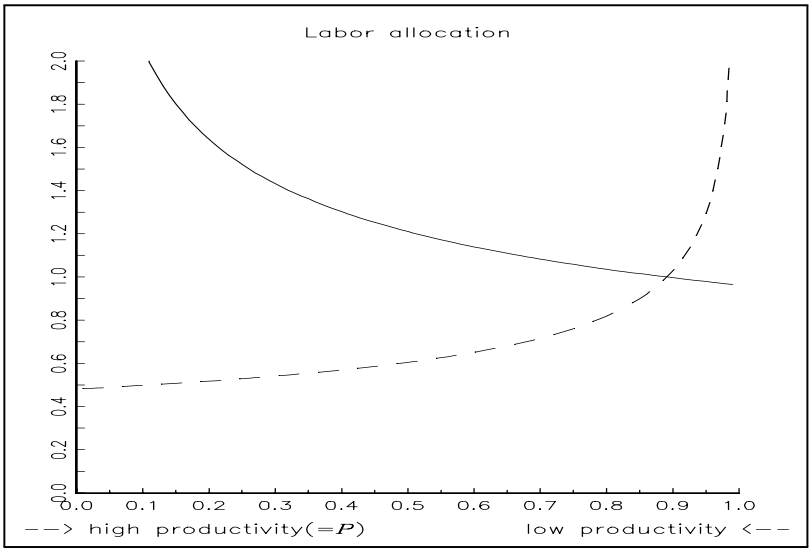

Figure 1: Allocation of labor across high- and low-productivity jobs. The crossing point satisfies condition (2) in the Appendix. Parameters: A_g=2; A_b=1; β=0.33; W_u=1.

equivalent non-employment income. It also maximizes the income accruing to owners of labor and other factors of production in the same proportions as the aggregate economy. Quite clearly, however, if not all labor is employed, then workers are all indifferent to employment.

2.2 Underemployment

Since the average product of labor is larger than its marginal product, suppliers of labor find it optimal to restrict supply, like any monopolist. From the point of view of workers who disregard the output in excess of the wage bill, it can be a good idea to allocate employed workers efficiently across jobs. But is is certainly attractive to set employment at a lower level than that which equalizes wages and non-employment opportunities. As shown in Figure 2, worker welfare increases with non-employment as the latter becomes larger than in laissez faire, and keeps on increasing until further decreases in employment outweigh the positive impact on wage rates.

2.3 Worker reallocation costs

In a dynamic environment where labor demand conditions at each employment site may with some probabilty switch from "good" to "bad," or viceversa, costless labor mobility should of course ensure that employment levels are so much higher at the "good" sites as to maintain equality of wages across all jobs. But when mobility is costly, the marginal productivity at "good" jobs must be higher than that at "bad" ones, so as to cover mobility costs. If mobility costs are pad by workers, then dynamic arbitrage on theit

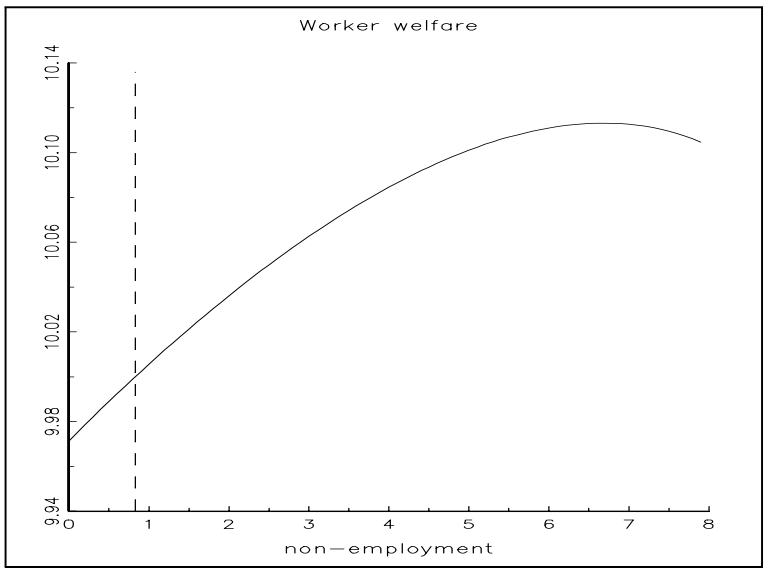

Figure 2: Worker welfare, expression (5) in the Appendix, as a function of non-employed labor. The vertical line identifies the competitive allocation ($W_g = W_b = W_u$). Parameters as in the previous figure, and α =0.1.

part is affected importantly by concavity of their utility.

The Appendix analyzes formally a situation where the labor income of a worker who is relocating from a "bad" to a "good" job fall short of the "good" wage by a fixed proportion, which may for example represent time spent seeking and reaching the new employment opportunity. Crucially, the simple model also supposes that workers' utility is a strictly concave function of their labor income, net of mobility costs. As in Bertola (2002), this represents limited opportunities for workers to access financial markets in order to smooth their consumption in the face of labor income shocks. And since mobility towards good jobs is financed out of relatively low consumption flows, its costs in utility terms are higher than they would be if labor income risk could be pooled at the level of the aggregate economy. In equilibrium, future expected wage gains need to be larger when their marginal utility is smaller relative to that of the moving workers' low consumption. When workers are risk averse, the labor market delivers larger wage differentials by allocating less labor to currently more productive jobs—or, equivalently, by reducing the intensity of labor mobility from low- to high-productivity jobs.

As fewer units of labor are employed in high-productivity jobs, production is lower when workers cannot access financial markets. Taking non-employment (studied above) as given, the net production flow of the economy is plotted in Figure 3 as a function of the share of employment in high-productivity jobs. The labor allocation delivered by this simple labor market's decentralized equilibrium (identified by the vertical dashed line) falls short of that which would maximize production, for two reasons (see the Appendix). On the hand, the intensity of labor reallocation in the example economy is lower than

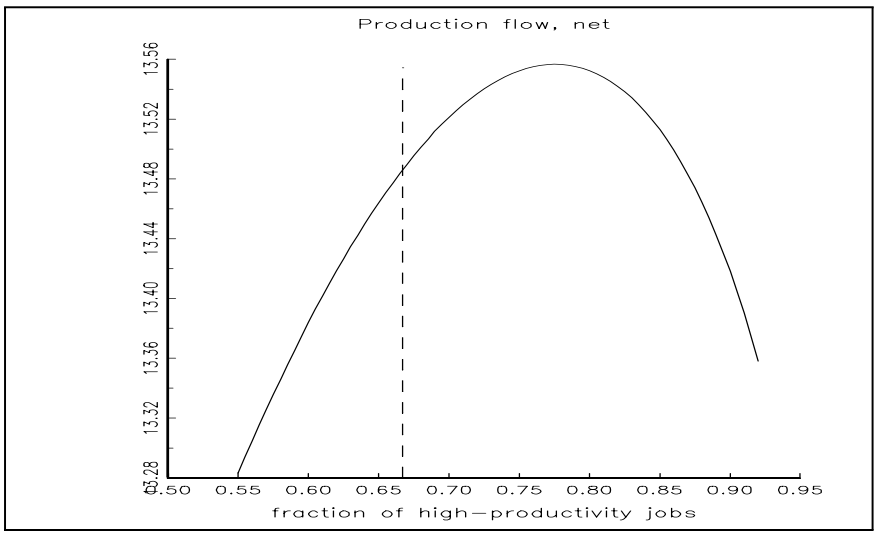

Figure 3: Aggregate production, net of mobility costs as a function of the proportion of employment in high-productivity jobs: see expression (11) in the Appendix, parameters as in the previous figures and p=0.2; X=0.3. The vertical line identifies the allocation implied by condition (10) in the Appendix.

would be necessary to maximize production flows, because the specification of mobility costs makes them a decreasing function of mobility through external effects. This may be viewed as representing mechanisms of the type studied by. Hosios (1990) in markets that clear through search rather than price-taking behavior; external effects could of course be specified so as to imply that mobility is excessive in decentralized equilibrium. On the other hand, and less ambiguously, workers' utility curvature implies that the fraction of "good" employment is reduced by the need to offer larger wage differentials to moving workers. When mobility costs bear on individual workers' consumption, rather than on aggregate resources, decentralized decisions intuitively fail to maximize the latter.

As was the case regarding the level of total employment, if workers' consumption coincides with their labor income then the impact on their welfare of labor allocation differs from the impact of that same variable on total production (and on the welfare of individuals who earn non-labor income). The average utility yielded to workers by each unit of employment allocated on the basis of uninsured mobility decisions is is plotted in Figure 4. It is a monotonically increasing function of the fraction of high-productivity employment, for the simple reason that average wage both increase and become more equal as more workers are employed at firms where labor demand is strong.

The next section discusses whether and how structural and policy features affect may affect the labor market interactions outlined above.

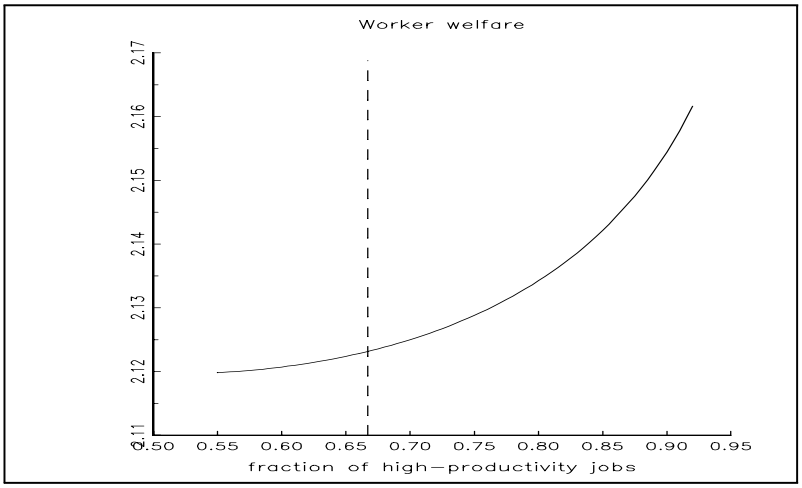

Figure 4: Average employed worker welfare as a function of the proportion of employment in high-productivity jobs: see expression (13) in the Appendix, parameters as in the previous figures. The vertical line identifies the allocation implied by condition (10) in the Appendix.

3 Labor market institutions and income distribution

Labor markets, and not only labor markets, are imperfect in many complicated ways. But the stylized model above highlights qualitative mechanisms that arguagbly motivate most collective interventions aimed at altering *laissez faire* wage and employment outcomes.

3.1 Overall employment

Consider first how the view of workers and other agents differ as regards the level of employment. Individuals who only earn labor income do not internalize the loss of output that accrues to other factors of production. Hence, they prefer wages to be higher than those delivered by competitive interactions, and may gladly accept the reduction in employment that would deliver that outcome. In the simple framework discussed above, if the wage is increased above that which equates aggregate supply and demand, workers who have no stake in the profits (or rents) accruing to other agents are collectively better off, since at the margin they were indifferent towards employment. And even as wages become discretely higher than the non-employment equivalent income, the simple sum of workers' utilities continues to increase as long as the unhappiness inflicted on disemployed workers who fall back on the outside opportunity is more than compensated, from the collective point of view, by the higher wage earned by the workers who remain employed.

This perspective can rationalize legal, or otherwise collectively set, *minimum wages*. Any situation where some workers that are not employed would rather be working would unravel to the competitive outcome if individual workers were allowed to bid for employment. A legal prohibition to do so, as implied by mandated minimum wage or by admin-

istrative extension to all workers of collective wage agreements, supports an outcome that is the workers' collective interest, eliminating the externality (from the point of view of workers as a group) entailed by an individual worker's incentive to bid for another's job. Of course, the simple sum of utilities need not be a sensible welfare criterion. In general, and especially if (as in the situation illustrated above) individual utility functions are strictly concave, the unemployed would at least *ex post* prefer to be employed. Still, a low-employment outcome can be agreeable to all workers if non-employed workers can partake of the higher average productivity (and wages) of employed ones. Some such redistribution can be effected by intra-family transfers, as in the case when the unemployed are sons and daughters of the employed. But outcomes with larger wage bill and lower employment (and profits) may also be supported by a system of *payroll taxation* funding *non-employment subsidies*, such as pensions or unemployment benefits or other welfare transfers, or public-sector employment opportunities at favorable wage/effort ratios (Algan et al., 2002). All such policies essentially serve the same purpose as an explicit wage floor: rather than by prohibiting workers from bidding down other workers' wages, alternative income-support sources eliminate the need to bid for employment. Hence, a variety of labor market policies may all serve the essentially similar purpose of inserting a wedge between labor demand and labor supply, with contractual or legislative lower bounds on wages resulting in open unemployment, and tax-and-subsidy schemes in a smaller or less effectively employed labor force.

In different countries and different periods, such different policies are implemented differently and more or less incisively (see the discussion in the next section), and it is insightful to view them as motivated by a distributional conflict which takes place under structural constraints, represented by the downward slope of the labor demand function, and is mediated by institutions. Not only the ease of union organization and the ability to enforce collectively-agreed wages on all workers, but also the ability to use non-market instruments to redistribute the wage bill from high-wage employed workers to unemployed workers matter for the desirability and feasibility of the low-employment outcome that approximate the maximization problem illustrated in Figure 2.

3.2 Labor reallocation and income stability

As regards institutional interference with the dynamic reallocation model introduced and illustrated above, consider first the role of workers' inability to shelter their consumption from labor-demand fluctuations. When risk averse workers cannot access financial markets, smaller wage differentials and easier mobility not only improve workers' welfare through a standard consumption-smoothing channel. By better aligning individual mobility incentives to aggregate rates of transformation, they also tend to improve productive efficiency as indexed by the proportion of high-productivity employment in the model. Thus, addressing this imperfection would be in the interest of employers as well as in that of workers. In reality, workers' consumption and their mobility investments can indeed be financed not only by contingent financial securities can finance workers, but also by self-insurance through asset accumulation and decumulation, and by private labor contracts with employer-financed training and/or redundancy pay provisions. Still, all such instruments fall short of implementing the smooth consumption paths and

efficiency-based reallocation and retraining decisions that would characterize a labor market with perfect financial market access. In reality, empirical earnings and consumption data tend to track each other quite closely at the individual level, especially at the low end of their distributions.[2]

When private financial and labor market contracts cannot shelter workers' consumption from idiosyncratic labor demand shocks and ensure that labor reallocation takes place efficiently, collective interventions can try and improve the resulting unsatisfactory situation. In the stylized framework outlined above, improvement on the *laissez faire* outcome entails taxing the payroll of high-productivity jobs, subsidizing that of low-productivity jobs, and reducing the workers' cost of moving from the latter to the former. Intuitively, taxing high wage realizations with relatively low marginal utility and subsidizing the consumption of workers who earn low wages makes sense from an *ex ante* insurance point of view. And since equalization of take-home pay would remove workers' incentives to move towards high-productivity jobs, a policy package meant to mimic a first-best allocation also needs to finance mobility out of aggregate resources, subsidizing mobility as needed to ensure that additional production is valued on the risk-neutral basis appropriate for idiosyncratic shocks.

Many real-life policies may of course be interpreted from this perspective. Clearly, *progressive taxation* can smooth workers' income and consumption, offsetting the implications of missing insurance markets (Varian, 1980). Centralized contracts which specify a compressed wage structure across heterogeneous regions or sectors can be rationalized by risk aversion on the part of immobile workers (Agell and Lommerud, 1992). More directly relevant are *unemployment insurance* [UI] schemes, which can fund job losers' search for high-productivity jobs and ease their exit from low-productivity and low-consumption jobs while also making them more reluctant to take up new ones; and *"active" labor market policies* [ALMP] which offer training and job-search assistance to displaced workers and job subsidies to low-earners, and can in principle address the efficiency implications of uninsured workers' reluctance to undertake forward-looking investment decisions. A little less intuitively, *employment protection legislation* [EPL] also tends to have qualitatively similar effects in an equilibrium environment. By making it costly to fire redundant workers, such legislation induces labor hoarding at low-productivity firms, and the wedge between wages and labor's marginal productivity at such firms is similar to that introduced by an explicit low-wage subsidy. Symmetrically, as concern with future firing difficulties discourages hiring at the model's high-productivity firms, employment protection tends to depress wages below marginal productivity there, just like a payroll tax would. And employment protection measures can also ease reallocation, like mobility subsidies would, to the extent that they mandates payments to workers made redundant through no fault of their own, or induce such payments in equilibrium, or encourage employers to react to labor demand shocks by reorganizing their workforce internally rather than through market mechanisms.

It would be very desirable in principle to address by such policies the shortcomings of *laissez faire* allocations. In practice, collective administration of tax-subsidy and

[2] See Attanasio and Davis (1996), Cutler and Katz (1992), Blundell and Preston (1998), Blundell, Preston, and Pistaferri (2002).

redundancy schemes is also imperfect, and certainly not costless, in ways that may make them more or less advisable in different circumstances.

3.2.1 Unemployment, insurance...

Of course, the details of policy implementation are important in models that explicitly account for the informational asymmetries that prevent markets from supporting insurance contracts, and collective policies from achieving perfect efficiency. Much depends on what causes unemployment in the first place, and on equilibrium interactions. When unemployed workers are tempted to exert low search effort, a declining pattern of benefits can induce them to search intensely initially, and efficiently reduce the duration of unemployment even as the relatively high initial level of benefits affords the same overall insurance as a lower constant level would (Shavell and Weiss, 1979). But the different search behavior of unemployed workers influences the equilibrium distribution of wage offers: declining benefits can lead to inefficient rejection of low wage offers by unemployed workers receiving high initial benefits even as their stronger search effort increases their rate of matching (Albrecht and Vroman, 2003), and high initial benefits can reduce "job retention" effort by currently employed workers (Wang and Williamson, 1996). So, the benefits and costs of UI systems depend on the character of information problems and market interactions, and the balance between them depend on the efficiency of policy implementation.

3.2.2 ... and employment protection

Similarly, EPL requires that termination of individual employees be motivated and/or that workers be given reasonable notice or financial compensation in lieu of notice, and grants workers a right to appeal against termination, sometimes stipulating reinstatement with back pay when the appeal is successful. Since such rights may not be lawfully overridden by contractual provisions, employment protection legislation interferes with individual contractual freedom as regards dynamic aspects of employment protection, just like administrative extension of collective agreements similarly interferes with individual wage-contracting freedom. And legislation often mandates administrative procedures, involving formal negotiations with workers' organizations and with local or national authorities, when large employers wish to proceed to collective dismissals of plant closures. These and other aspects of labor law do aim at addressing informational problems and ascertain whether dismissals are "fair:" the letter of the law prevents employers from firing incompetent or lazy workers, but countries where EPL is stringent do require them to prove—through regrettably costly court procedures—that termination is justified, and administrative review of collective redundancies is generally aimed at ascertaining that employers have properly considered ways to perform internal adjustment, and encouraging them to compensate workers for the "social" costs of redundancies—costs that financial markets may fail to internalize properly to firms' dynamic profit maximization problems. While it would be quite naive to expect government interventions to provide costlessly the same insurance that markets find it impossible to provide, it would also be naive to presume that properly designed policies cannot go some way towards resolving

the relevant imperfections (Bertola, 2002).

3.3 Insurance and/or production efficiency

In summary, institutional intervention in the labor market *certainly* entails costly information collection and performance monitoring and/or deadweight inefficiencies, at the same time as it *may well* improve the efficiency of market allocations in an imperfect world. Not only markets but also collective policies find it difficult to implement appropriate state-contingent transfers both to improve workers' welfare and increase aggregate production (and profits). The relative merits of different policies *vis a vis* markets depend on structural features. A society that can process information more efficiently at the aggregate level than in market interactions would be predicted to feature more pervasive policy interventions of the active type, based on tax-and-subsidy packages and/or direct management of labor reallocation costs. Societies with limited administration capabilities might tend to privilege simpler regulatory policies instead and, as in the case of EPL, mandate employers (presumably better-informed and better-insured than their employees) with avoiding, or financing, labor reallocation.[3] In general, one would expect to see more limited policy interference in economies where they cause small beneficial effects and large deadweight losses, because the structure of economic interactions gives ample scope for individuals to escape regulation and taxation.

Importantly, however, the effects of policy are not the same on the welfare of workers who cannot shelter their consumption from income fluctuations, and on that of individuals who can access perfect financial markets instead. As shown in Figure 4, workers benefit from allocation of more labor to high-productivity jobs. However it is not mobility *per se* to improve workers' welfare, which is only a function of the overall level and stability of wages. An efficient allocation of labor increases profits, but does not benefit uninsured workers when it is achieved by making wages more flexible (and consumption more volatile) around a roughly unchanged average. Hence, workers and other agents differ in their appreciation of any given policy's impact on productive efficiency.

To illustrate this point, consider a policy that, in the context of the uninsured labor reallocation model of Section 2, imposes a proportional payroll tax on all employment relationships at good firms, pays a proportional subsidy to all workers employed by bad firms, and uses a portion of excess good-wage tax revenues (which exceed low-wage subsidies since bad jobs are less numerous and pay lower wages than good jobs) to pay a subsidy to all workers who are changing jobs. This policy configuration leaves employers free of turnover costs but, as mentioned, the implications for marginal productivities andof employment protection legislation can be similar.

By correcting the misallocation introduced in *laissez faire* by workers' inability to access financial markets, redistribution and mobility subsidies can improve both workers' welfare and the economy's overall production flow if it policy implementation is efficient

[3] Experience-rated contributions to reallocation or unemployment funds, of the type advocated by Blanchard and Tirole (2003), may combine elements of both. In reality, workers' marginal utilities and employers' marginal productivites are not directly observable, and of course much more hetergoeneous than in the simple two-state model used here for illustrtative purposes. Hence, labor courts and designers of bureaucratic schemes face difficult problems.

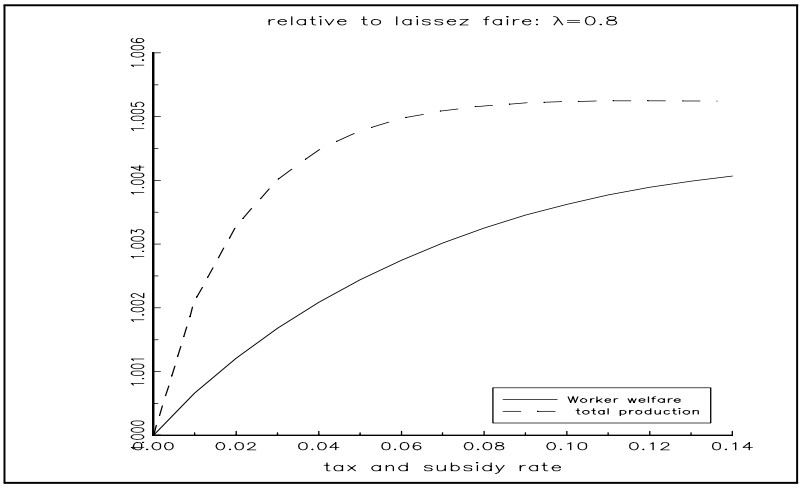

Figure 5: Worker welfare (continuous line) and total net production flow (dashed line) as a function of the rate at which high wages are taxed and low wages subsidized, with λ =80% of the remaining revenue financing mobility subsidies. Other parameters as in previous figures. Expressions (11) and (13) in the Appendix, with P solving condition (15) for each tax rate.

(i.e., more efficient than private financial-market interactions). Figure 5 plots, as a function of the tax-and-subsidy rate, worker welfare and overall production when 20% of net tax revenues is lost to administration and deadweight costs. Even though policy implementation is costly, efficiency gains can be obtained in the second-best situation we are considering. Not only the welfare of workers whose consumption is smoothed by the tax-and-subsidy component of the policy increases relative to its *laissez faire* level, normalized at unity in the figure. Since the policy subsidizes mobility and increases the fraction of high-productivity employment, it also has a positive effect on the economy's overall production flow.

In Figure 5, as the policy becomes more incisive the welfare of workers increases because they benefits both from higher and from more stable utility flows. It keeps on increasing, through the latter insurance-based channel, even as net production flattens out. And when a very inefficient policy is considered in Figure 6, which sets to zero the fraction of payroll tax revenue devoted to mobility subsidies, worker welfare is still an increasing function of the tax and subsidy rates (which smooth consumption), but the net production flow declines dramatically as equalization of take-home pay removes workers' incentives to move towards more productive jobs. Workers' insurance gains lead them to prefer even very wasteful arrangements of this type to a *laissez faire* that burdens them (and not society) with mobility costs and, as shown in Figure 7, leads to a sharp decline of "profits" (or income flows accruing to factors of production other than labor) as incentives to mobility are removed. Of course, this can decrease total production if the supply of non-labor factors of production is elastic (for example, if capital can flow

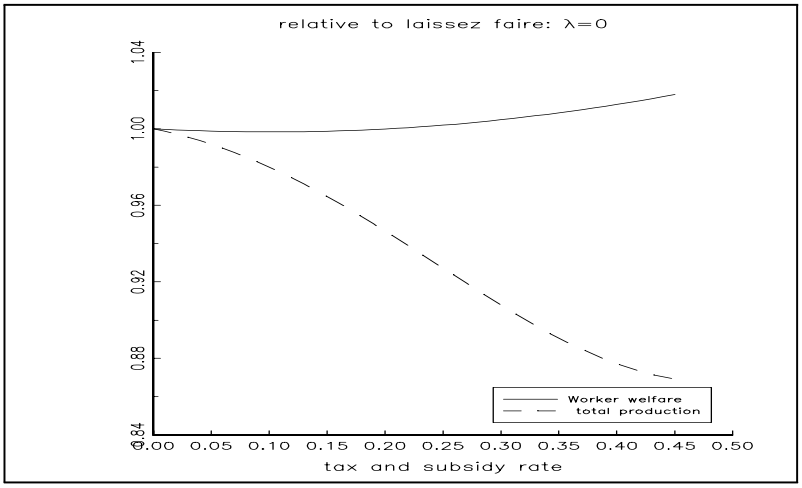

Figure 6: Same as Figure 5, but high-wage tax revenue not used to subsidize low wages is wasted.

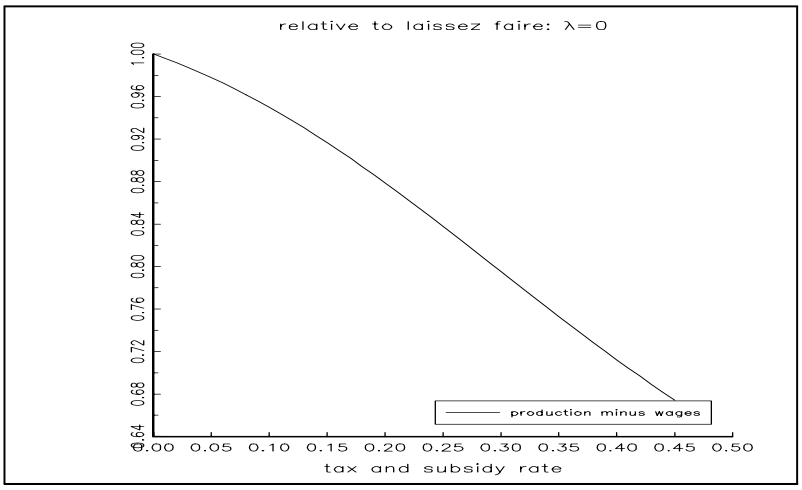

Figure 7: Gross production flow minus gross wage flow for the same parameters as in Figure 5.

into an out of the economy considered).

But just as workers who have no stake in aggregate production over and above their wages do not appreciate high employment that depresses wages towards their outside opportunity, so workers without access to financial instruments favor policies that stabilize their labor income even when those policies waste aggregate production by reducing labor mobility along with the wage and consumption differentials that drive it. Just as one should not be surprised to see policy reduce overall employment in countries and periods where workers have limited access to ownership of non-labor factors of production and consumption-smoothing opportunities, and have some weight in political decisions processes, it is similarly unsurprising to see in such countries *wage compression* reduce workers' incentives to reallocate or retrain their labor at the same time as *dismissal restrictions* with costly administrative authorization procedures prevent labor reallocation, rather than finance and encourage it.

3.4 Why are institutions so different across countries?

This is a difficult question to answer precisely, but an easy one to answer in broad generality. As indicated by the illustrative framework of the previous section, the benefits and costs of collective interventions in the labor market depend on structural features (such as the externality arising from the specification of mobility costs above), on the ease of individual financial market access (as indexed by the degree of utility curvature in the simple model above), and on the efficiency of collectively implemented policies. And they also differ across individuals, especially as regards differences in factor endowments when market interactions fail to smooth these out.

The need to address market failures, the ability of collective schemes to do so, and the political weight of workers interested in obtaining more protection against consumption shocks at the expense of productive efficiency all differ across economies and historical periods. This can in principle offer useful insight as to the rationale of institutional settings, and the desirability of reforms. Distributional concerns within an economy subject to uninsurable reallocation shocks can explain why labor market institutions often aim at providing job and wage security in the face of uninsurable labor demand shocks. The evidence analyzed by Agell (2002) casts doubts on the notion that regulated labor markets lead to inefficiency, or that more open economies tend to deregulate. Of course, it is empirically difficult to disentangle endogenous interactions between these and other structural and institutional featured from exogenous differences across countries: for example, cultural and ethnic homogeneity may ease implementation of collective policies, or an efficient legal system may improve market interactions. While such features are not easy to measure and need not be fully exogenous to economic interactions, progress has been made in bring such a perspective to bear on labor market institutions: Botero et al. (2003) and Bertola and Koeniger (2003) offer different, but complementary perspectives on the relationship between indicators of judicial efficiency, labor market institutions and outcomes, and financial market features. The following sections outline simple empirical facts that, while stopping very much short of answering the question above, offer suggestive indications of meaningful covariation across some aspects of labor market regulation and of labor market outcomes.

4 Some evidence from industrialized countries

A vast literature studies unemployment and other aspects of labor market experience in light of labor market institutions, emphasizing in particular the contrast between the United States (and other Anglo-Saxon countries) on the one hand, and European (especially Continental European) countries on the other hand. The experiences of these two groups of OECD member countries have largely mirrored each other over the last few decades. If in the 1960s, and until most of the 1970s, the unemployment rate of typical European countries was much smaller than its American counterpart, by the late 1980s a virtually uninterrupted trend increase brought European unemployment rates to exceed North-American ones by a large multiple. The literature seeking explanations for this "reversal of fortune" phenomenon has focused primarily on labor market institutions, such as high levels of union coverage and generous social insurance benefits. Since cross-country differences in such respects were largely the same in the 1960s and 1970s as in the more recent period, the literature has also focused on restrictive monetary policy in Europe and other macroeconomic shocks, found to explain a large portion of diverging unemployment experiences especially when interacted with institutional features. Public employment patterns and demographic factors (such as the more rapidly falling size of the youth population) have also been shown to play a potentially important role.[4]

Of particular interest from the perspective outlined above is the relationship between labor market institutions and the inequality and instability of labor incomes. Empirical work on such aspects can for example exploit the wide variation of EPL stringency across countries. Only some EPL aspects, such as the number of months' notice required for individual and collective redundancies, are readily measured quantitatively. Others aspects are more difficult to measure precisely, for example the willingness of labor courts to entertain appeals by fired workers and the interpretation placed by judges on the notion of "just cause" for termination. When available EPL indicators are positively correlated with each other, however, it is possible to form qualitatively unambiguous cross-country rankings of EPL, and to relate such rankings to (also qualitative) indicators of labor market performance, in light of theoretical implications. The evidence reviewed by Bertola (1999) and its references suggests that more stringent EPL is indeed associated with more stable aggregate employment paths. Before considering in the next section how this analysis may be extended to Latin American and other countries, this section offers a brief review of simple evidence regarding the relationship of labor market institutions and labor income distribution and stability in OECD countries.[5]

Figures 8 plot wage inequality against the OECD employment protection index. From the simple theoretical perspective outlined above, it is not surprising to see that wage are compressed in the same markets where EPL is most stringent. Quantitative firing

[4] For a review of the issues and empirical results see Bertola, Blau and Kahn (2002a) and their references, especially Nickell and Layard (1999), Blanchard and Wolfers (2000); and Nickell, Nunziata, Ochel, and Quintini (2003), Algan, Cahuc, and Zylberberg (2002). Bertola (2001) offers a simple discussion of economic insights and empirical indicators.

[5] Only simple bivariate graphs are reported here. More detailed evidence and discussion may be found in Bertola (2003), which focuses particularly on the changing impact and configuration of labor market institutions in OECD countries' experience.

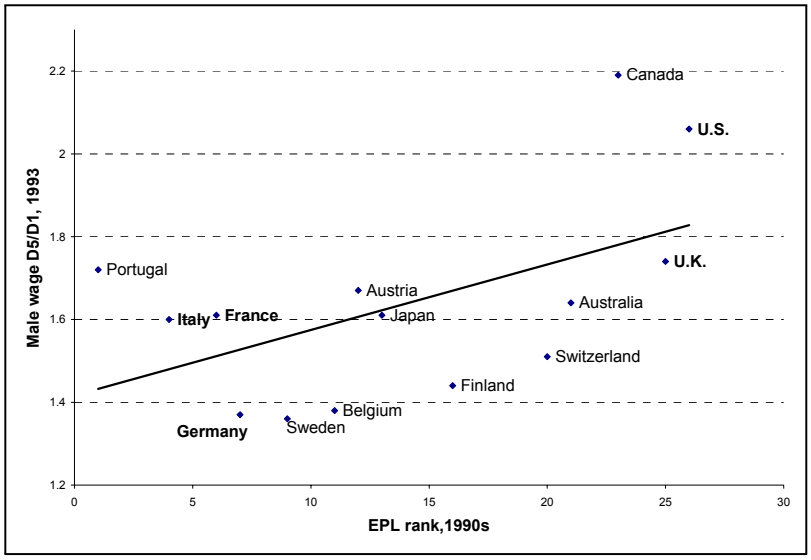

Figure 8: Horizontal axis: employment protection ranks (lowest=most stringent), on the basis of late 1990s indicators. Vertical axis: ratio of median wages to the tenth percentile of wage distribution, full time male workers. Source: OECD.

restrictions, in fact, could hardly be binding if wage fluctuations were completely unrestrained: in response to the labor demand shocks that EPL are meant to protect workers against, wages could fall so as to make stable employment profitable, or to induce voluntary quits. Hence, limiting the freedom offered to employers and workers in setting wages gives force to quantity constraints. Moreover, to the extent that redundancy payments reduce workers' mobility costs, and are larger when they are mandated by legislation than when they are left to imperfect private contracts, it is not surprising in light of workers' mobility incentives to find that more stringent EPL is associated with smaller equilibrium wage differentials. To the extent that job security provisions explicitly require, or implicitly encourage, payments from the firing firm to departing employees, more stringent EPL implies that mobility costs are at least partly borne by firms, rather than by workers, and should be associated with smaller wage differentials in situations where voluntary mobility across jobs is observed. Figure 9 shows that indicators of the intensity of labor reallocation across firms are only mildly related to EPL rigidity indicators. This does not readily support a simple view of EPL as a rigidity factor, and may perhaps be taken to indicate that, in terms of the simple framework above, payments to redundant workers do foster financing of mobility by financially constrained workers.

In practice, "rigid" labor market configurations appear quite effective in sheltering workers from idiosyncratic labor-income fluctuations. The OECD index of EPL stringency is not surprisingly strongly associated with average tenure lengths in Figure 10. It is also positively associated with wage stability indicators (Figure 11). The latter piece of evidence only refers to the few countries where time-series stability indicators

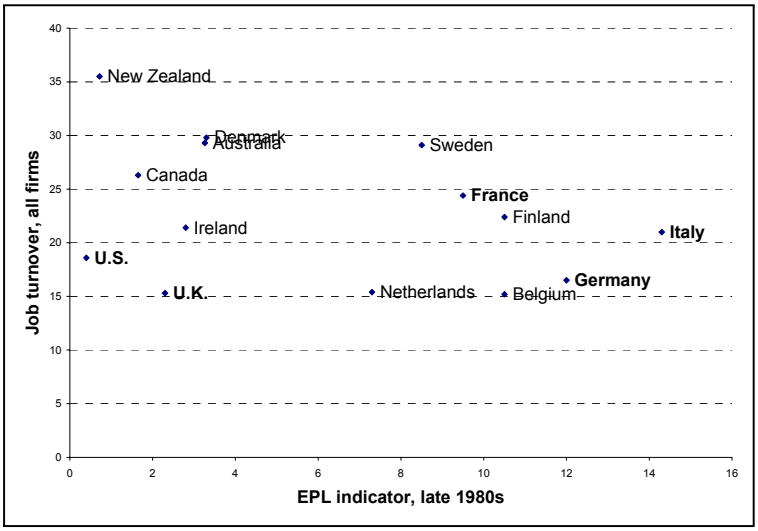

Figure 9: Horizontal axis: Fix-term and regular employment protection legislation rank, OECD 1989; Vertical axis: job turnover (absolute employment increases and declines across all firms, normalized by employment level), OECD.

are available, but is particularly relevant to the theoretical perspective outlined above. In heavily regulated labor markets, workers who are employed tend to remain employed, and their wages tend to remain stable over time. Stability of labor income for such workers is valuable in protecting their (and their families') consumption from fluctuations. In the absence of suitable smoothing instruments, heterogeneous welfare losses from labor demand instability may rationalize frequently expressed concerns with increasing wage inequality and labor market insecurity in the US, the UK, and other relatively unregulated labor markets. The simple evidence of Figure 11 can also be interpreted in terms of the welfare effects of labor income inequality and instability at the individual level. As in Benabou and Ok (2001), inequality can be associated with higher welfare for risk-averse individuals if mobility is intense, and the transition probabilities to higher and lower income (and consumption) levels are nonlinear so as to give good "prospects of upwards mobility." This condition is almost satisfied in US data, where individuals need not resent inequality very much. In other OECD countries, however, prospects of upward mobility for workers appear much more limited, and even when currently poor workers may look forward to higher future income financial markets tend to prevent consumption smoothing. Data and information are scarce regarding households' (as opposed to firms') financial market access, but Bertola and Koeniger (2003) show that less developed consumer credit (as determined by countries' historically determined judicial efficiency) makes stable labor incomes more attractive from a welfare-theoretic point of view, and is empirically associated with stringent EPL and with wage compression in available cross-country data. To the extent that wage inequality is endogenous to labor market institutions, it is not surprising to see it very limited in countries with low

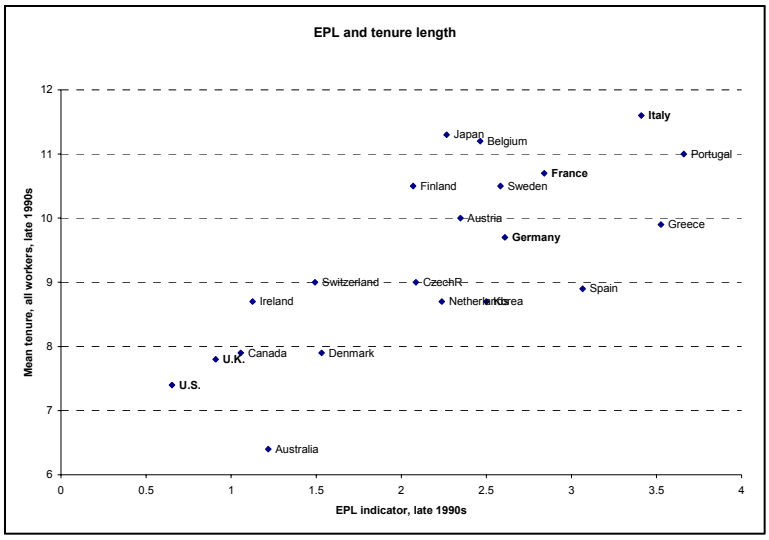

Figure 10: Horizontal axis: Overall employment protection indicator in the late 1990s, OECD; Vertical axis: Mean tenure across jobs existing in 1995, OECD.

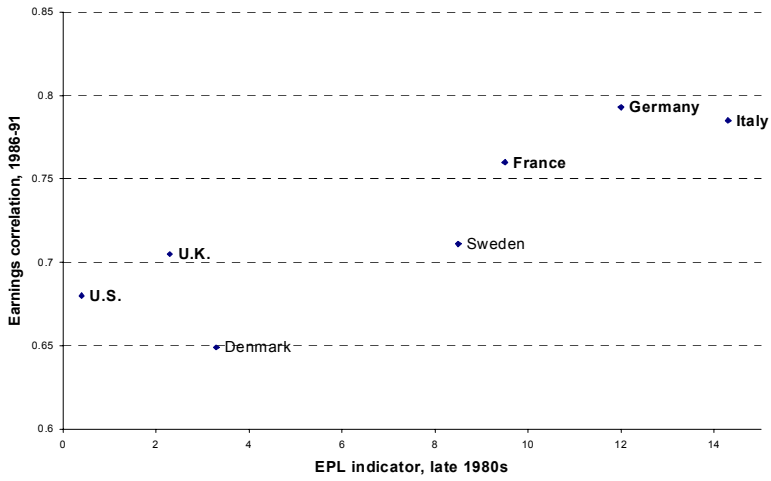

Figure 11: Empirical relationship between wage stability (correlation of earnings over 5 year after 1986 for full-time employees) and employment protection legislation. Data source: OECD.

earnings mobility and tight borrowing constraints.

While labor reallocation across jobs is only mildly related to the stringency of EPL in OECD countries (Figure 9), flows between employment and unemployment are much smaller in high-EPL economies (see Blanchard and Portugal, 2001, for evidence and references). In the same economies that provide equal and stable incomes to employed workers, in fact, other institutions (like collective bargaining) tend increase average wages and to make low-productivity workers difficult to employ, and to generate a large and stagnant stock of unemployed workers. The data do give indications of meaningful trade-offs between employment rates and wage equalization. Figure 12 shows that higher wage inequality is significantly associated with higher employment rates, after controlling for country effects (which may capture institutional and structural features that change only slowly over time, if at all, within each country) and time effects (which may offer a stylized summary measure of the common technological or trade-related forces that tended over the 1970-2000 period to increase the differentiation and turbulence of labor demand in industrialized countries).[6] To the extent that employment is overall lowered by high collectively-bargained wages, unemployment and other forms of non-employment are concentrated at the beginning and at the end of individual working careers, as well as in the female segment of the potential labor force.[7]

5 Latin American data and evidence

The literature is just beginning to apply to non-OECD countries the insights reviewed and illustrated above. The cross-country set of labor market institutions and outcomes assembled by Botero et al. (2003) spans a very wide range of countries, and its analysis by the authors leads them to argue that historically determined judicial and legal systems may be viewed as an exogenous source of institutional variability across countries. As regards Latin America, the contributions summarized and discussed by Heckman and Pagés (2004) offer mostly country-specific studies of time-series experiences, emphasizing the role of labor market reforms and the use of microeconomic information, and attempting to explore the impact effects of labor market reforms—which are not frequent in any country, and do not appear to produce consistent patterns of effects.

Research is of course hampered by relative scarcity of cross-country comparable information. As regards labor market outcomes, unemployment and labor force participation (hence, employment) rates are available in the World Bank WDI database yearly, only beginning in 1980 and ending in 2000 for most (but not all) countries. Some yearly data are missing, perhaps indicating changes of country-specific definitions. Not all countries may be large enough to represent an independent observation, and not all countries in the WDI database also appear in institutional-indicator databases. The relevant information is available for a set of 20 industrialized and 16 Latin American countries which

[6] Bertola, Blau, Kahn (2002a) and Bertola (2003) offer a more detailed discussion of such phenomena, and of the role of labor market institutions in mediating structural shocks' impact on wage and employment patterns.

[7] Bertola, Blau, and Kahn (2002b) show that institutions motivated by rent extraction in labor's favor naturally tend to induce stronger wage increases, and steeper employment declines, for elastically supplied labor.

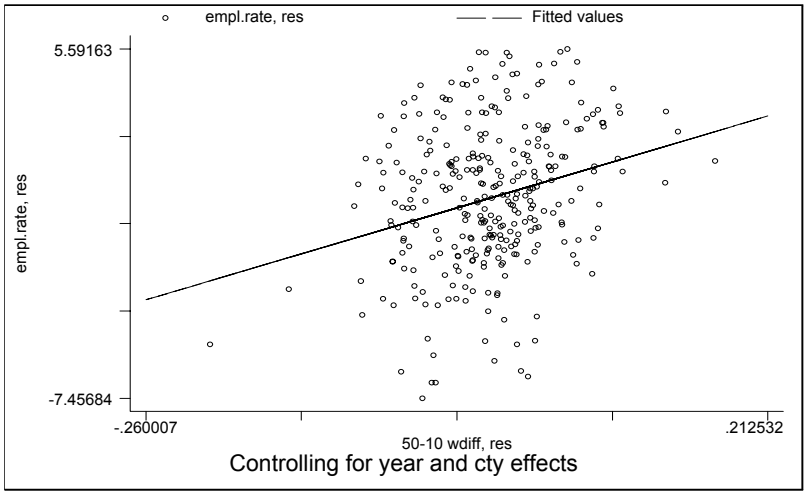

Figure 12: Residuals from regression on year and country dummies. Horizontal axis: difference between the median and 10th percentile of the overall wage distribution (all data available in the OECD "Trends in earnings inequality" database); Vertical axis: employment rate of working-age population (OECD Economic Outlook database).

do appear *a priori* worthy of inclusion in regressions and other relationships specified and interpreted on an unweighted basis.[8]

As regards institutions, available information is again and not surprisingly less plentiful and precise than that compiled and made available for industrialized countries by the OECD. The Heckman and Pagés (2004) study of Latin American labor laws is based on institutional information obtained from surveys of country officials, aggregated in an index aimed at summarizing in terms of wage labor costs the impact not only of social security and other tax/subsidy provisions, but also that of firing restrictions, on the basis of US-source turnover rates and somewhat sparse. While this indicator cannot provide a perfect measure of EPL's dynamic impact, when computed on a consistent basis for both OECD and Latin American countries it does indicate that the latter tend to be more regulated. And a similar impression is conveyed by the purely insti-

[8]Identifiers for OECD countries: aus=Australia, aut=Austria, bel=Belgium, can=Canada, deu=Germany, dnk=Denmark, esp=Spain, fin=Finland, fra=France, gbr=United Kingdom, grc=Greece, irl=Ireland, ita=Italy, jpn=Japan, nld=Netherlands, nor=Norway, nzl=New Zealand, prt=Portugal, swe=Sweden, usa=United States. The sample excludes Iceland and Luxembourg (because too small) and Switzerland (by mistake); the WDI database does not classify Mexico, Turkey, and recent Central European members in the group. Latin American country identifiers: ARG=Argentina, BOL=Bolivia, BRA=Brazil, CHL=Chile, COL=Colombia, CRI=Costa Rica, DOM=Dominican Republic, ECU=Ecuador, HND=Honduras, JAM=Jamaica, MEX=Mexico, NIC=Nicaragua, PAN=Panama, PER=Peru, URY=Uruguay, VEN=Venezuela. Countries omitted for lack of data or small size are Antigua and Barbuda, Aruba, Bahamas, Barbados, Belize, Cayman Islands, Cuba, Dominica, El Salvador, Grenada, Guatemala, Guyana, Haiti, Netherlands Antilles, Paraguay, Puerto Rico, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Suriname, Trinidad and Tobago, U.S.Virgin Islands.

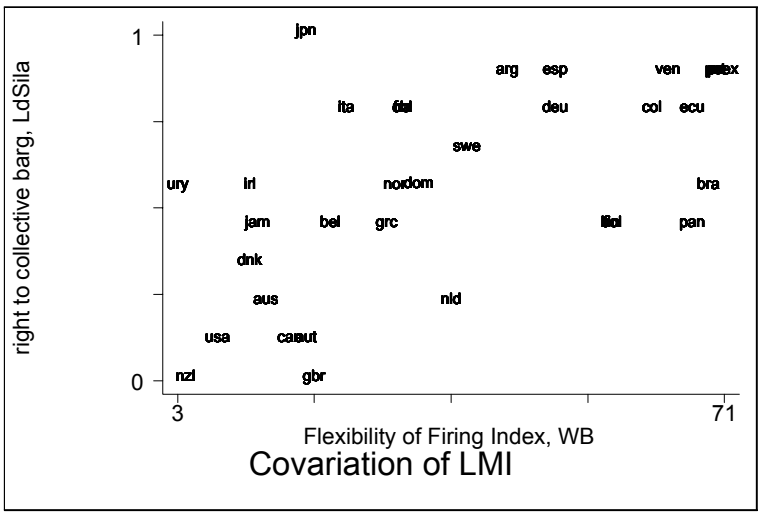

Figure 13: Horizontal axis: Flexibility of Firing Index, World Bank Rapid Response website, http://rru.worldbank.org/DoingBusiness. Vertical axis: index of collective bargaining legal rights, Florencio Lopez De Silanesweb data set (index_col_barg1: "normalized sum of: (i) labor union power [employer duty to bargain with union, extension of collective contracts to third parties, law allowes closed shops] (ii) right to unionization in the constitution. (iii) right to collective bargaining in the constitution."

tutional indicators compiled by the World Bank's Rapid Response Unit, displayed in Figure 13 along with one among the many indicators of institutional interference with *laissez faire* labor markets available in Florencio Lopez de Silanes's database, namely a simple index of collective-bargaining rights that may capture workers' ability to implement low-employment outcomes.[9] These data deliver two simple messages. First, institutional interference with employers' freedom to dismiss redundant workers covaries positively with constraints on individual contractual freedom across both OECD and Latin American countries, and not only among the former, indicating that both may be motivated by underlying country-specific economic and political concerns with imperfect (especially from the workers' point of view) *laissez faire* outcomes. Second, Latin American countries (with the exception of Uruguay and Jamaica) cluster in the high-regulation quadrant of the figure, in the company of such OECD countries as Germany and Spain, while Anglo-Saxon countries are found in the opposite quadrant.

To see whether labor market outcomes across these countries are consistent with available institutional information, consider first the theoretical association between dismissal costs and employment stability. (Of course this simple test, and those proposed

[9] Experimentation with the index of unionization rights gives rather different results, in particular no association with low-employment outcomes. Skeptical readers may interpret this as an indication of poor data quality, and scale down the (already low) t statistics reported below. Other readers may instead interpret this as an indication that unions may foster efficiency in the face of both market and government imperfections, along the lines of Checchi and Lucifora (2002).

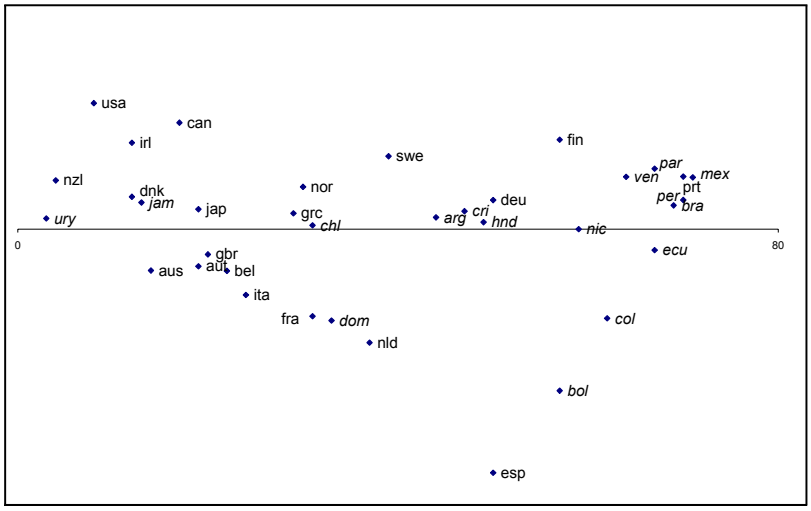

Figure 14: Horizontal axis: Flexibility of Firing Index, as in previous figures. Vertical axis: deviation from overall average of country-specific slope coefficient in a regression of employment rate changes on real output growth rates, with country-specific intercepts (1980-2000, sample period stops earlier for some countries; data source: WB World development indicators database).

below regarding employment and unemployment levels, give indications as much about the data's quality as about the fit of theoretical implications.) Figure 14 reports the cross-country association between the available index of dismissal regulation and a simple measure of employment stability, namely the deviation of country-specific coefficients from their cross-country average in a regression of changes of employment rates on the growth rate of output per worker. This coefficient should be more positive when employment reacts more strongly to changes in productivity and demand, i.e., when labor hoarding is less pervasive. The regression also includes country-specific intercepts, which should to some extent capture productivity and employment rate trends—but, of course, not regime changes in such trends, as may occur upon transition out of agriculture and changes in demographic employment patterns across genders and age groups. Reassuringly, employment does react more strongly to production changes in countries with more rigid employment relationships, although the relationship is far from strong: in a linear parametric regression of employment-rate changes on GDP growth rates and on the interaction of GDP growth with the index of employment protection, the latter has the expected negative sign, but is not significant (t-statistic=0.67).

Assuming that economic structures and shock intensities are similar when assessing the implications of institutions is clearly less appropriate in the Latin American than in the OECD context, where all countries experienced broadly similar fiscal/monetary policy and energy cost shocks. In a more extended study, it would be possible to collect for non-OECD countries observable "shock" indicators of the type considered by Blanchard and Wolfers (2000). Lacking such information, one can try and infer the typical strength

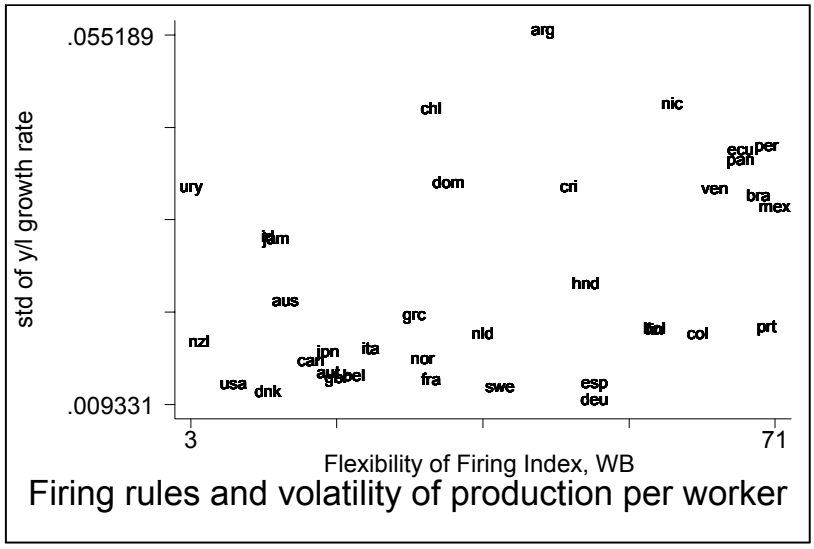

Figure 15: Horizontal axis: flexibility of firing index (see previous figures). Vertical axis: standard deviation of growth rate of GDP per employed worker (computed for 1980-2000 from WB World development indicators data).

of labor demand and other shocks in the relevant countries from the volatility of production. Of course, that volatility is itself affected not only by labor demand movements but also by labor supply movements, or more generally by the cyclical character of wage fluctuations. And it is even more relevantly affected by the stringency of constraints on employer's ability to hire and fire labor: it is intuitive, and not difficult show formally, that if employment patterns are smoothed out by firing restrictions then total production should be less variable, and production per worker more variable, in the face of similar driving processes. For a given value of the firing rules index in Figure 15, and presumably similar incentives to engage in labor hoarding behavior, Latin American countries tend to display higher volatility of production. Hence, we may not surprisingly infer that those countries' labor demand is less stable than that of OECD countries—and that their employment dynamics, while more pronounced than those of more industrialized and less regulated labor markets, are substantially smoothed by binding institutional restrictions.

Turning next to the impact of regulation on employment and unemployment rates, it is instructive to first consider the bivariate association of dismissal restrictions and average employment rates (in the 1980-2000 period, or the shorter period of data availability). Figure 16 displays a mild negative association: employment rates are higher in countries (such as the Anglo-Saxon members of the OECD) that do not regulate dismissals much than in countries (such as Latin American ones) where employment protection legislation is stringent. Of course, it would be naive to conclude from this association that rigidity of labor market relationships damages employment. Ideally, one would need to control for the structure and evolution of the labor force, for other

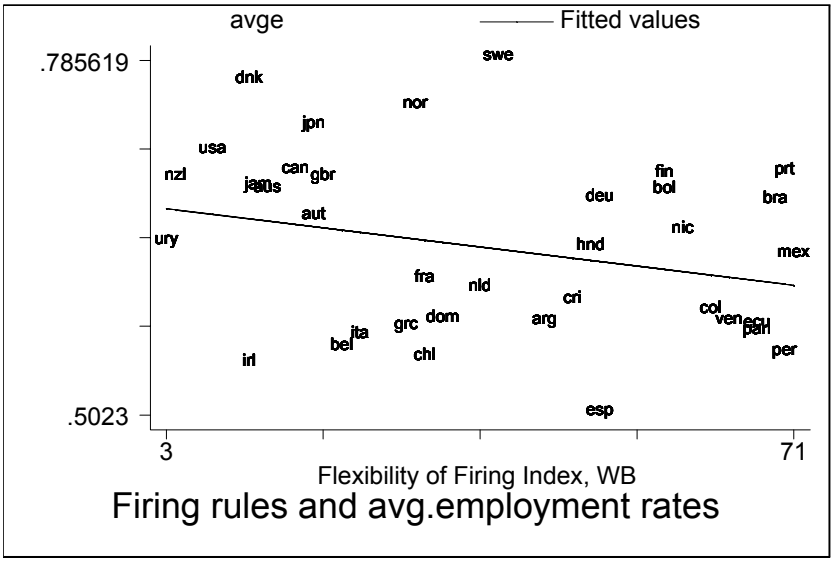

Figure 16: Horizontal axis: flexibility of firing index (see previous figures). Vertical axis: employment rate (computed for 1980-2000 from WB World development indicators data).

observable development indicators, and for unobservable country-specific as well using time-varying institutional indicators (see Bertola, Blau, and Kahn, 2002b). Lacking such data, it is already interesting from the perspective of this paper to note that the imperfect correlation of available firing-cost and collective bargaining indicators (Figure 13) offers a useful opportunity to try and disentangle the effects of institutions meant to protect workers against uninsurable shocks, such as employment protection, from those of institutions aimed at decreasing employment and increasing wages, such as collective bargaining rights.[10]

To this end, Table 1 reports the results of regressing unemployment and employment rates on the two institutional indicators displayed in Figure 13, both for the whole sample and allowing Latin American coefficients to differ from OECD ones. The indicators are constant within each country, and the fit of these equations is poor.[11] Still, it is interesting to find that while collective bargaining rights do tend to increase unemployment and decrease employment rates, firing restrictions insignificantly have the opposite effect in controlled regression, counter to the impression conveyed by Figure 16's bivariate plot. Differences between OECD and Latin American coefficients are only significant in the case of unemployment: Latin American unemployment rates were definitely higher in the 1980-2000 period but, at least o the basis of this overall weak evidence, this out-

[10] Of course, unemployment insurance and payroll taxation with non-employment subsidies also have related effects, but only better information would make it possible to try and disentangle them.

[11] Specifications with year dummies, which may capture employment developments common across countries within the period, yield similar estimates for the coefficients of interest.

Dependent variable:	Unemployment rate (percentage points)			Employment rate (fraction)	
Flexibility of Firing (0=high flex -> 100=low flex)	-0.01925	0.01475		-0.00041	0.00017
	(0.45)	(0.25)		(0.54)	(0.14)
interaction with Latin America dummy		-0.09709			-0.00034
		(1.19)			(0.25)
Collective bargaining rights (0=weak -> 1=strong)	1.69376	1.34452		-0.07455	-0.05587
	(0.53)	(0.37)		(1.35)	(0.8)
interaction with Latin America dummy		-10.1353			-0.10602
		(1.52)			(0.96)
Latin America dummy		13.06667			0.04285
		(2.54)			(0.77)
Constant	8.54283	7.13669		0.69423	0.67931
	(6.66)	(5.56)		(34.39)	(25.17)
R-squared	0.01	0.17		0.12	0.19
Test of all coefficient equality across LA and OECD subsamples: p-value	0.0517			0.6181	

Robust t statistics in parentheses (593 country*year observations, clustered by country). Results are very similar for specifications with year dummies.

Table 1: Regressions of unemployment and employment rates on institutional indicators. Data sources: Unemployment rates and employment rates (computed from unemployment and labor force participation rates), World Bank WDI database. Index of collective-bargaining legal rights, Florencio Lopez De Silanes, http://iicg.som.yale.edu/data/datasets/labor_dataset_4_01_03.xls. Flexibility of Firing Index, World Bank Rapid Response website, http://rru.worldbank.org/DoingBusiness.

come should not be blamed on the institutions considered. The information conveyed by the simple-minded linear regressions reported in the table is that collective bargaining rights tended to increase unemployment less in Latin America than in the OECD, and that firing restrictions had no impact on OECD unemployment but a somewhat negative impact on Latin American unemployment.

5.1 On the future of Latin American labor market research

The simple evidence above, as mentioned, offers as much a test of the institutional data as of the theory. The results of such tests are far from clear-cut, but nothing in that and other evidence denies the insights gained by the literature's analysis of OECD data: collective bargaining may well tend to decrease employment and increase unemployment, but labor market regulation's effects are in general more nuanced and firing costs stabilize, but do not decrease on average, the level of employment at given wages.

The quality of the data and empirical results currently available for Latin America now is perhaps comparable to that available for OECD countries 15 years ago (as in e.g. Bertola, 1990). One would expect that further insights, such as the distributional implications emphasized above or the tendency of regulation to decrease employment of

secondary labor force groups (Bertola, Blau, and Kahn 2002b), may also be applicable to Latin American countries. However, the (at least nominally) comparable labor-income inequality and stability data that would make it possible to extend the discussion of Section 3 to Latin American countries are not yet available. Further, and more importantly, when extrapolating theoretical and empirical work from OECD to Latin American reality one needs to account for important differences between these two groups of countries, as regards within-country inequality of resources and levels of market development on the one hand, and time-series instability of macroeconomic and institutional conditions on the other.

Inequality is, of course, a serious matter in Latin American and other industrializing countries.[12] And if, as argued above, labor market institutions often trade production efficiency and profits for "protection" of workers with limited access to financial markets, conflicts of interests between "capitalists" and "workers" may well be more relevant in Latin America than those between employed and unemployed (and other categorizations of workers) studied by Saint Paul (2002) in an industrialized-country context. Further, mobility is likely limited by a stronger class structure, and more limited education and training opportunities, than in most of the developed world countries depicted in Figure 11. Thus, if labor market institutions are endogenous to political processes where workers have some weight, it is not surprising to see more intrusive institutional interference in Latin America than in OECD countries. And to the extent that income stabilization for workers with limited or no access to international financial markets destabilizes other agents' (capital) income, it is also not surprising to see highly volatile capital flows in that region (Bertola and Drazen, 1994).

As regards the dynamics of macroeconomic and institutional developments, the relevance of forward-looking considerations in labor market behavior and the strong reform tensions in Latin American labor markets imply that measurement issues should in principle addressed by using some measure of expected (rather than current) institutional rules in constructing forward-looking indicators, such as the simplified but potentially insightful measurement approach of Heckman and Pages (2004), rather than the purely cross-sectional indicators used above for illustrative purposes. The relevant empirical issues are complex, as suitable reform instruments are difficult to identify in a setting where not only outcomes, but also institutions may be viewed as endogenous variables. Still, detailed country-specific studies of the type collected and discussed by Heckman and Pages (2004) offer intriguing indications of sensible covariation between reform features and economic circumstances, and suggest that the starkness of Latin American developments should offer fertile grounds for interpretation of similar, if slower, developments in European countries. For example, Cassoni et al (2000) report that Uruguay experienced a dramatic regime change from a "command" economy to unionization, and from near-autarky to Mercosur integration. The large increase in the economy's openness, presumably resulting in more elastic labor demand, had theoretical and empirical implications for labor market interactions that appear similar to and much more dramatic

[12] The Gini coefficients reported by the World Bank WDI database range from 24.7 (Denmark, 1992) to 40.8 (United States, 1997) among OECD countries, and from 36.4 (Jamaica, 1996) to 60.7 (Brazil, 1998) among Latin American ones; the simple average of the 20 OECD Gini coefficients is 30.9, that of the 23 Latin American Ginis is 49.41.

than those relevant to industrialized countries experiencing globalization and European integration: the 49% real wage decrease in the decade after 1973 in that country certainly dwarfs wage-moderation trends in Europe during the 1990s.

Inequality and reforms, of course, interact importantly. If labor market institutions are a partial substitute for inefficient financial contract enforcement (Bertola and Koeniger, 2003), and more flexibility in the labor market makes limited access to consumption smoothing all the more painful for workers, it is not surprising to witness heavy resistance to labor market liberalization in industrialized countries with poor financial markets, and it is sensible to package together labor and financial market reforms, as was the case in the United Kingdom's 1980s experience (Koeniger, 2003). As both the redistributive political appeal and the efficiency costs of labor market regulation are enhanced by Latin America's inequality and instability, it may not be suprising to witness much more dramatic reforms there than in OECD countries. From this perspective, Latin American countries offer a rich set of reform experiences: several have pioneered the use of notional benefit accounts, which may indeed target the financial market failures emphasized above as possible rationales for observed collective interference with labor market outcomes. If the rate of return on notional benefit accounts suitably reflects that of investment opportunities that are available at the aggregate economy's level, but not to individual workers, they can for example ease the liquidity-constrained problems studied by Bertola and Koeniger (2003), at least if withdrawals are allowed in the relevant contingencies.

In summary, the dramatic variability of macroeconomic and institutional dynamics in most Latin American countries offers welcome empirical opportunities to gain further insights into theoretical mechanisms. But the equally dramatic heterogeneity of personal circumstances in less developed countries makes it important to take into account the intended benefits of institutional interference with the workings of labor markets when discussing their actual shortcomings.

Appendix

The relationship between the marginal worker's revenue product and the wage is

$$A_i L_i^{-\beta} = W_i. \tag{1}$$

The labor demand schedule has constant elasticity $0 < \beta < 1$ for simplicity, and is subject to multiplicative exogenous shocks. The level of that shock, A, and the employment L and wage W are all indexed by i, and may refer to a specific firm, sector, or region within an aggregate economy. To make the points of interest it will suffice to consider only two possible values of that index: $i = g$, for "good" employment opportunities, and $i = b$ for "bad" ones. The wage-equivalent income of workers who are not employed in either kind of job will also play a role in what follows: let it be denoted W_u and, for simplicity, let it be the same for all individuals in a population of total size $\bar{L}$.

Denoting with U the number of non-employed labor units, and with P the proportion of employment at high-productivity sites, we have $L_g = (\bar{L} - U)P$ and $L_b = (\bar{L} - U)(1 - P)$. Equality of marginal productivity at the two sites,

$$A_g (P)^{-\beta} = A_b ((1 - P))^{-\beta}, \tag{2}$$

obtains if

$$P = \frac{A_g^{1/\beta}}{A_g^{1/\beta} + A_b^{1/\beta}}, 1 - P = \frac{A_b^{1/\beta}}{A_g^{1/\beta} + A_b^{1/\beta}} : \tag{3}$$

quite intuitively, with $A_g > A_b$ the fraction of employment in with higher average productivity jobs is larger than that at lower-productivity ones. The overall level of employment is determined by equality of wages to the outside opportunity W_u: the condition

$$A_b \left((1 - P)\left(\bar{L} - U\right)\right)^{-\beta} = A_g \left((1 - P)\left(\bar{L} - U\right)\right)^{-\beta} = W_u \tag{4}$$

is solved by

$$U = \bar{L} - \left(A_g^{1/\beta} + A_b^{1/\beta}\right) W_u^{-1/\beta}.$$

If this is a positive quantity, then overall employment falls short of the total available labor $\bar{L}$; otherwise, all individuals are employed, and their income exceeds W_u.

Let the utility accruing to workers be a power $0 < \alpha < 1$ of their labor income, and consider a simple-minded measure of labor's collective welfare, namely the sum total of all workers' utility:

$$\bar{V} = P(\bar{L} - U)(W_g)^{\alpha} + (1 - P)(\bar{L} - U)(W_b)^{\alpha} + (W_u)^{\alpha} U.$$

The utility function is concave and, of course, monotonically increasing: so, utility is equalized by equalization of all workers' incomes, as in (2) and (4). With $W_g = W_b = W_b$ the welfare of workers is simply given by $(\bar{L})(W_u)^{\alpha}$, regardless of whether some of them participate in the labor market or they all simply gather their non-employment opportunities. In fact, the utility acruing to workers in the aggregate is increased by a reduction of employment, inasmuch as lower employment increases wages along sloped demand curves in the form (1). Keeping fixed at the expressions in (3) the proportions

of employment allocated to the two types of jobs, the extent of non-employment U and the wages earned by the $\bar{L} - U$ employed workers are related according to

$$W_g = W_b = A_g \left(P\left(\bar{L} - U\right)\right)^{-\beta} = \left(A_g^{1/\beta} + A_b^{1/\beta}\right)^{\beta} \left(\bar{L} - U\right)^{-\beta},$$

and

$$\begin{aligned} \bar{V} &= \left(\bar{L} - U\right) \left(A_g \left(\frac{A_g^{1/\beta}}{A_g^{1/\beta} + A_b^{1/\beta}} \left(\bar{L} - U\right) \right)^{-\beta} \right)^{\alpha} + (W_u)^{\alpha} U \\ &= \left(\bar{L} - U\right)^{1-\beta\alpha} \left(A_g^{1/\beta} + A_b^{1/\beta}\right)^{\beta\alpha} + (W_u)^{\alpha} U \end{aligned} \tag{5}$$

is increasing in U at the point where $W_g = W_b = W_b$:

$$\begin{aligned} \frac{d\bar{V}}{dU} &= -\left(1 - \beta\alpha\right)\left(\bar{L} - U\right)^{-\beta\alpha} \left(A_g^{1/\beta} + A_b^{1/\beta}\right)^{\beta\alpha} + (W_u)^{\alpha} \\ &= -\left(1 - \beta\alpha\right)(W_g)^{\alpha} + (W_u)^{\alpha} = \beta\alpha\,(W_u)^{\alpha} > 0. \end{aligned}$$

As long as $\beta\alpha < 1$, workers' welfare is maximized when the ratio of wages to non-employment equals $(1 - \beta\alpha)^{-1/\alpha}$. In the $\alpha = 1$ case of risk neutrality, this is a familiar markup in the form $(1 - \beta)^{-1}$. The markup can be shown to be smaller when $\alpha < 1$. Intuitively, the higher, but more unequal labor income induced by higher unemployment is not as attractive when the utility function is concave.

Let p denote the probability of a shock that causes productivity to fall from A_g to A_b, and also of the opposite transition. While workers who are not relocating earn W_b or W_g, workers who move from a bad to a good job earn XW_g, with $X \leq 1$. Again supposing that workers' utility flows are a concave function of their labor income, consider the undiscounted expected values of utility accruing over an infinite horizon to workers holding each type of job. If V_g denotes that value from the point of view of a worker who holds a good job, and has no reason to move, we can write

$$V_g = (W_g)^{\alpha} + \left[(1 - p)V_g + pV_b\right], \tag{6}$$

since the job may remain good with probability $1 - p$ but may also turn bad. Symmetrically, a worker holding a bad job and remaining there can hope that a positive labor demand shock will be realized, which occurs with probability p: thus,

$$V_b = (W_b)^{\alpha} + \left[pV_g + (1 - p)V_b\right]. \tag{7}$$

Subtracting (7) from (6) equations yields

$$2p\left(V_g - V_b\right) = (W_g)^{\alpha} - (W_b)^{\alpha}. \tag{8}$$

A worker holding a bad job, however, can move to a good job: the value of doing so is $(XW_g)^{\alpha} + \left[(1 - p)V_g + pV_b\right]$, and if workers are individually indifferent to mobility it must be the case that this is the same V_b in (7), to imply that

$$(W_b)^{\alpha} - (XW_g)^{\alpha} = \left[\left(1 - 2p\right)\left(V_g - V_b\right)\right].$$

This equation and (8) yield a relationship between the wages paid by the two types of jobs, which differ in terms both of their current productivity and in terms of possible future developments:

$$(W_g)^\alpha = (W_b)^\alpha + ((W_g)^\alpha - (XW_g)^\alpha)\, 2p \tag{9}$$

Solving for the wages configuration that makes mobility optimal for workers, labor allocation must be such as to yield

$$\frac{W_g}{W_b} = (1 - (1 - X^\alpha)\, 2p)^{-1/\alpha}.$$

In equilibrium, the proportional wage premium paid by good jobs is positive, since $0 < 1 - \xi\,(1 - X^\alpha) < 1$ for all of $\{\xi, X, \alpha\} \in (0,1)^3$. It is quite intuitively decreasing in X, since as that parameter approaches unity mobility becomes costless (and equalizes wages). It is also increasing in p, the probability of a change in labor demand conditions: as labor demand becomes less stable, larger wage premia are needed to compensate moility investments by workers who have an option to stay put and hope for an improvement of their current job's conditions. As p approaches one-half, the proportional wage premium approaches $1/X$, and in the $p = 0.5$ case where the future outlook is the same at all jobs wages must be such as to compensate workers for their mobility costs within the same period when mobility occurs.

If $p < 0.5$, conversely, the labor income of workers who change jobs lower than W_b: mobility is still optimal, but only because workers can look forward to persistently high wages once they reach a "good" job. The relevance of forward-looking considerations implies that their utility's degree of concavity plays an important role in determining equilibrium wage differentials and the intensity of mobility. In fact, it can be shown that the equilibrium ratio of good to bad wages is decreasing in α as long as $p < 0.5$: it is lowest at the upper boundary of the $\alpha \in (0,1]$ range, and increases as α declines towards zero making the utility function increasingly inelastic.[13]

Again denoting with P the proportion of employment at good firms, in equilibrium it must be the case that $\frac{A_g P^{-\beta}}{A_b (1-P)^{-\beta}} = \frac{W_g}{W_b}$, so

$$P = \frac{\left(\frac{W_g}{W_b} A_b\right)^{-1/\beta}}{\left((A_g)^{-1/\beta} + \left(\frac{W_g}{W_b} A_b\right)^{-1/\beta}\right)}. \tag{10}$$

On average $\int_0^P A_g x^{-\beta} dx = \frac{A_g}{1-\beta} P^{1-\beta}$ is produced at high-productivity jobs, and $\int_0^{1-P} A_b x^{-\beta} dx = \frac{A_b}{1-\beta}(1-P)^{1-\beta}$ at low productivity ones. But as a fraction p of high-productivity jobs experiences a negative shock, and the same fraction of bad jobs a positive one, $p(2P-1)$ units of labor are relocated each period: since each moving

[13] The sign of the derivative

$\frac{d}{d\alpha}\left(\frac{1}{1-\xi(1-X^\alpha)}\right)^{1/\alpha} = \left(\frac{1}{1-\xi+\xi X^\alpha}\right)^{\frac{1}{\alpha}} \frac{(1-\xi+\xi X^\alpha)\ln(1-\xi+\xi X^\alpha) - \xi X^\alpha (\ln X^\alpha)}{\alpha^2 (1-\xi+\xi X^\alpha)}$

is the same as that of its second term's numerator. This vanishes at $X^\alpha = 1$ and is positive for smaller values of X^α, since its derivative with respect to X^α is $\xi \ln(1-\xi+\xi x) - \xi \ln x > 0$ for $p < 0.5$ and $X^\alpha < 1$. Unitary or larger values of the utility function's elasticity of substitution, i.e. $\alpha \leq 0$ for functions in the form $(c^\alpha - 1)/\alpha$, of course yield even larger wage differentials.

worker earns only a fraction X of the good wage she's moving to, in the aggregate mobility dissipates $(1-X)W_g = (1-X)A_g P^{-\beta}$ units of output in flow terms. Total production is then given by

$$\left(\frac{A_g}{1-\beta}(P)^{1-\beta} + \frac{A_b}{1-\beta}(1-P)^{1-\beta} - p(2P-1)(1-X)A_g(P)^{-\beta}\right)(\bar{L}-U)^{1-\beta}: \quad (11)$$

it is maximized when

$$A_g(P)^{-\beta} - A_b(1-P)^{-\beta} - (1-X)2pA_g(P)^{-\beta} + p(1-X)A_g\beta P^{-\beta}\left(2-\frac{1}{P}\right) = 0. \quad (12)$$

But the proportion of high-productivity employment delivered by this simple labor market's decentralized equilibrium falls short of this, for the reasons discussed in the text. The first three terms of condition (12) add up to zero in equilibrium only if mobility decisions are taken on a risk-neutral basis ($\alpha = 1$); otherwise, they exceed zero, since mobility by uninsured workers calls for larger wage differentials. And even under risk neutrality the last positive term would call for even higher P and even lower wage differentials, because the proportional specification implies that external effects reduce the cost of mobility as mobility becomes more intense and reduces good wages.

The average utility yield of a unit of employment is

$$\begin{aligned}\bar{V} &= (W_g)^\alpha + (W_b)^\alpha \quad (13)\\ &= (A_g)^\alpha (P)^{-\beta\alpha} + (A_b)^\alpha (1-P)^{-\beta\alpha}.\end{aligned}$$

To simplify notation, let the tax and subsidy rate be the same fraction τ of pre-tax wages (and labor marginal productivities). The after-tax mobility condition for uninsured workers is then

$$((1-\tau)W_g)^\alpha = ((1+\sigma)W_b)^\alpha + 2p\left(((1-\tau)W_g)^\alpha - (X(1-\tau)W_g(1+\nu))^\alpha\right), \quad (14)$$

where the proportional mobility subsidy ν must obey the policy's budget constraint: $\nu X(1-\tau)W_g$ is paid to each of the $p(2P-1)$ units of labor reallocated in a typical period, the revenue of payroll taxes net of low-wage subsidies is $\left(\tau A_g(P)^{1-\beta} - \tau A_b(1-P)^{1-\beta}\right)$, but only a fraction λ of this is available to fund mobility. The shortfall of λ below unity represents administration costs and/or the deadweight costs of distorted economic behavior. Hence,

$$\nu = \frac{\tau A_g(P)^{1-\beta} - \tau A_b(1-P)^{1-\beta}}{p(2P-1)X(1-\tau)W_g}\lambda$$

is the mobility subsidy rate. Inserting in equation (14) this expression and expressions for gross wages in terms of P, the equilibrium fraction of high-productivity jobs, the latter is determined in equilibrium by a condition in the form

$$\begin{aligned}&(1-2p)\left((1-\tau)A_g P^{-\beta}\right)^\alpha = \left((1+\tau)A_b(1-P)^{-\beta}\right)^\alpha\\ &-2p\left(\frac{p(2P-1)X(1-\tau)A_g P^{-\beta} + \tau\lambda\left(A_g(P)^{1-\beta} - A_b(1-P)^{1-\beta}\right)}{p(2P-1)}\right)^\alpha, \quad (15)\end{aligned}$$

which can be solved numerically.

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