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A REVERSE HOLDUP PROBLEM: WHEN WORKERS' LACK OF BARGAINING POWER SLOWS ECONOMIC ADJUSTMENTS

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ABSTRACT

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A reverse holdup problem*

When workers' lack of bargaining power slows economic adjustments

Antonio Estache† Renaud Foucart‡

April 2013.

Abstract

In a model of horizontal matching on the labor market, we show that increasing workers' bargaining power may increase some employers' incentive to switch to new production activities. In particular, this could lead to (i) higher wages, (ii) more jobs, (iii) better jobs and (iv) higher profits. Paradoxically, the median voter may object to the economic adjustments because search costs could cut the surplus for a majority of workers, even when it creates jobs for the other ones and increases aggregate surplus.

1 Introduction

Debates on labor market issues associated with the "Great Recession" often blame increasing and lasting unemployment on ageing production structures resulting from ineffective or misled industrial policies. This ignores that causality may run both ways. We focus on the case in which causality runs from poor labor policies to the product market.

We argue that, when skills are horizontally heterogeneous among workers, it may be an insufficient, rather than excessive, bargaining power for workers that explains the inability of an economy to create good jobs. This is because employers may not want to invest in a sector corresponding to minority skills if they know the workers with these skills will not bear the search costs

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to find the right employer. This happens when the expected share of the surplus these workers get is not high enough. This issue is less visible when the economy is doing well as the productivity of mismatched workers is still high enough to avoid structural unemployment.

Even without unemployment, increasing workers' bargaining power can increase the quality of matching because it gives employers incentives to offer the right economic structure. Firms offset their loss of bargaining power by increasing their profits from a changed production mix resulting from an improved matching in the labor market. In a world with structural unemployment, increasing bargaining power for workers could also increase the total number of jobs by giving employers the incentive to offer jobs to all types of workers. Therefore, in this economy, there is no necessary tradeoff between more jobs and better jobs (as, for instance, in Marimon and Zilibotti (1999)). Our results contrast with the classic holdup problem where too high a bargaining power for workers deters the employers to invest enough and therefore leads to suboptimal productivity (Acemoglu and Shimer (1999)). It also relates to another ex ante investment problem documented by Gall, Legros and Newman (2006), where limits in the allocation of surplus within firms may either hinder the investment in human capital from workers, or generate a misallocation of employers to employees.

Still, even when increasing workers' bargaining power creates more jobs, better jobs, and increases employers' profit, such an increase may not be implemented. This happens when the dominant group of workers loses surplus in spite of their increased bargaining power. This surplus loss arises if the expected search cost they bear as a result of the diversification of the economy outweighs the gains from the wage increase. Thus, paradoxically, a reform that increases all workers' bargaining power may be opposed by a majority of workers, even if it improves matching in the labor market and increases aggregate surplus. As the median voter is part of the dominant group, this reform will be opposed by the government.

We believe this model can help to understand the failure of labor policies in a large number of European countries, with exceptionally high unemployment rates among their educated youth. Assume there is an 'old' sector, in which a majority of older workers are more productive (because, for instance, they are more experienced), and a 'new' sector, where a minority of young workers are more productive (because their skills are more adapted). In the two political institutions that may influence workers' bargaining power (the unions and the government), the median voter is an older worker. Hence, a policy that would make both employers and younger workers better off by

creating more and better jobs, will never be implemented, unless those 'young' workers manage to get more political influence.

Spain provides a particularly striking example. Before the last crisis, the Spanish job market was offering low bargaining power to workers without an existing long-term contract. In the period 1995-2001, more than 90% of new hires were under temporary contracts, such that:

> *(...) in just a decade, a fairly regulated labour market with high dismissal costs and strong unions' bargaining power at wage determination turned into a very divisive labour market, where around two-thirds of the employees enjoyed permanent contracts (...) and kept the high bargaining power of the past, while the remaining one-third are workers under fixed-term contracts entailing much less favourable employment conditions.* Dolado, Garcia-Serrano and Jimeno (2002, p.271)

At the time, economic conditions were favourable and Spain was enjoying a high level of employment, including among young workers. However, those workers[1] enjoyed a low bargaining power and were largely working in 'old' sectors (construction work was one of the main drivers of job creation). With the crisis, the productivity of young workers became insufficient to be employed in those sectors, and they were the most heavily hit by unemployment.[2] After the crisis, the government's policy has been to implement labor market reforms such that "The main measures of the 2012 reform basically amount to a substantial shift in bargaining power away from workers and towards employers." (Bentolila, Dolado and Jimeno (2012, p.6)). In our setting, this policy (together with a decrease in the outside option of workers) corresponds to an attempt to increase employment by making workers employable in the wrong sector. We argue that such a policy is likely to worsen the main problem of the country: the economic structure.

The main assumptions of this paper are that workers only get partial bargaining power, bear search costs on the labor market, and that employers are limited in the choice of jobs they supply (they have to choose a sector). This boils down to the idea that labor markets are "thin" in the sense that: (i) job search is costly (Manning (2003), Burdett and Mortensen (1998) and Albrecht and Bo

[1] Well before the crisis, young educated workers were called 'mileuristas' because no matter their skills and sector of employment they started to be paid around 1000 Euros per month and only very slowly progressed out of that category.

[2] Spain's youth unemployment (less then 25 year old) rose from 18.2% in 2007 to 53.2% (+35.0%) in 2012. For the rest of the population, the figure rose from 7.0% to 19.4% (+12.4%). This has to be compared with the average of the European Union (UE 27), where youth unemployment increased from 15.7% to 22.9% (+7.2%) and from 6.6% to 10.1% (+3.5%) for the rest of the population (Eurostat, 2013).

(1987)); (ii) jobs are somehow differentiated (Staiger, Spetz and Phibbs (2010), Brueckner, Thisse and Zenou (2002), Hamilton, Thisse and Zenou (2000), Bhaskar and To (1999) and Helsey and Strange (1990)) and (iii) creation/advertisement of a job is costly, hence employers only advertise jobs they expect to fill (Manning (2011)).

Another crucial assumption is that we take bargaining power as an exogenous parameter, identical across workers. With on-the-job search and vertical differentiation, Postel-Vinay and Robin (2002) show how wage dispersion arises (identical employee-employers pairs yield different wages) even when employers have full bargaining power. Adding the possibility of Nash bargaining on wages, Cahuc, Postel-Vinay and Robin (2006) show that the main determinant of wage increases is not individual bargaining power, but competition among firms.

The rest of the paper is organised as follows. We present the setup of the game in the next section, and its resolution in section 3. Section 4 presents the main result of the papers in three theorems. Section 5 presents additional results that emphasize the differences between minimum wage, outside option and bargaining power. We conclude in section 6. For those propositions that do not follow directly from the text, formal proofs are collected in the appendix.

2 Setup

The economy is composed of N employers, and M workers. There are two types of workers (a and b). A share $\alpha > \frac{1}{2}$ of the M workers is of type a, and a share $1-\alpha$ of type b.[3] The share of workers of each type is common knowledge and the types are perfectly observable. An employer decides to offer jobs in sector either A or B at no cost. A good match ($a-A$ or $b-B$) generates surplus V, and a mismatch generates surplus v, with $V > v > 0$. An employer can be matched with more than one worker, but a worker can work for either zero or one employer. When a worker is successfully matched with an employer, he keeps a share $\lambda \in (0,1)$ of the surplus, corresponding to his bargaining power. A worker also benefits from an outside option of value r.

The game is sequential. We solve by backward induction and look for Subgame Perfect Nash Equilibria (SPNE). As we want to identify market failures that are not coordination failure, we

[3] We briefly explain in the end of section 5 why the logic is similar with a larger number of types.

allow employers to coordinate towards their Pareto-dominant equilibria. In practice, we rely on the concept of coalition-proofness (Bernheim, Peleg and Whinston (1987)) and do not consider SPNE for which there exists a self-enforcing profitable deviation by a coalition of employers. In the first stage (T=1), employers simultaneously choose their sector. The outcome of this stage is n_A, the number of employers in sector A, and $n_B = N - n_A$ the number of employers in sector B. As there is no fixed costs and employers are free to choose, the expected profit is identical in both sectors.[4] In the second stage (T=2), each worker gets a first free match. Then, she decides either to search for another employer (the linear cost for each search is $s > 0$),[5] to accept the job (and take a share λ of the surplus), or to leave the market and take her outside option r. Workers know the number of employers of each type, but cannot direct their search. Employers and workers are risk neutral, and therefore maximize their expected utility. To make the results nontrivial, we assume $\lambda V > r$, and discuss two cases: $\lambda v \geq r$ (always full employment) and $\lambda v < r$ (potential for structural unemployment).

3 Resolution

3.1 Decision rules - T=2

We start by assuming $\lambda v \geq r$, and then discuss the other case. A worker of type a matched with an employer of sector A receives surplus $U = E(U) = \lambda V$. It is never a best response for her to search (as there is no better match). A worker of type a matched with an employer of sector B decides to search if her expected utility by searching is higher than her utility from accepting the job, this is if:

$$\lambda V - s\frac{N}{n_A} \geq \lambda v \tag{1}$$

Where $s\frac{N}{n_A}$ is the expected search cost to be paid before meeting an employer of sector A. It therefore depends on the share of jobs offered in this sector. Denote by γ the share of employers in sector A, $\gamma = \frac{n_A}{N}$, equation (1) rewrites:

$$\gamma \geq \frac{s}{\lambda(V - v)} \tag{2}$$

[4] As there is a finite number of employers, this may imply that the marginal employer plays a mixed strategy between both sectors in equilibrium.

[5] We sometimes refer to the payment of search costs as "frictional unemployment".

Similarly, a worker of type b, matched with an employer of sector B receives surplus $U = E(U) = \lambda V$. It is never a best response for him to search (as there is no better match). A worker of type b, matched with an employer of sector A decides to search if his expected utility by searching is higher than his utility of accepting the job, this is if:

$$(1-\gamma) \geq \frac{s}{\lambda(V-v)} \tag{3}$$

When a mismatch does not yield enough surplus ($\lambda v < r$), the benefits of searching have to be compared to the outside option. Equations (2) and (3) then become:

$$\gamma \geq \frac{s}{\lambda V - r} \tag{4}$$

$$1-\gamma \geq \frac{s}{\lambda V - r} \tag{5}$$

3.2 Decision rules - T=1

Again, we start by assuming $\lambda v > r$. Therefore, workers never take the outside option. We focus on employers' best response to the four possible pure strategies of workers in T=2: (a) no one searches, (b) only workers of type a search, (c) both types of workers search and (d) only workers of type b search. In this subsection, we show that the two candidates coalition-proof SPNE are (a) and (c).

a. No one searches

In this case, the respective expected profits are given by:

$$E(\pi|A) = \frac{\alpha M}{N}(1-b)V + \frac{(1-\alpha)M}{N}(1-b)v \tag{6}$$

$$E(\pi|B) = \frac{(1-\alpha)M}{N}(1-b)V + \frac{\alpha M}{N}(1-b)v. \tag{7}$$

As $\alpha > \frac{1}{2}$, it is always a best response for all employers to choose sector A. Obviously, if there are only employers in sector A, no one searches. This is a SPNE if there is no profitable deviation from employers. This is always true if an employer switching to sector B is not enough to make

workers of type B search:

$$\frac{1}{N} < \frac{s}{\lambda(V-v)} \tag{8}$$

When $\lambda v < r$, condition (8) becomes:

$$\frac{1}{N} < \frac{s}{\lambda V - r} \tag{9}$$

b. If only workers of type a search

Lemma 1 *There is no SPNE where only workers of type a search.*

Proof. As, even without search from workers of type a, the expected profit of an employer is higher in sector A when workers of type b do not search, no employer wants to offer jobs in sector B. Therefore, there is no need to search for employers in sector A. ■

c. If both types of workers search

In this case, the expected profit of an employer of sector A is given by the sum of the expected profit from workers of type a for which he is a first draw, and the one from workers of type a who found him after searching. This is:

$$E(\pi|A) = \frac{\alpha M}{N}(1-b)V + \frac{\alpha M}{N}(1-b)V\sum_{i=1}^{\infty}(1-\gamma)^i \tag{10}$$

$$E(\pi|A) = \frac{\alpha M}{N}\frac{(1-b)V}{\gamma}. \tag{11}$$

Similarly, for an employer in sector B:

$$E(\pi|B) = \frac{(1-\alpha)M}{N}\frac{(1-b)V}{1-\gamma}. \tag{12}$$

In equilibrium, the expected profits must be identical. Therefore, such an equilibrium exists when $E(\pi|A) = E(\pi|B)$, $\gamma = \alpha$, and therefore $n_A = \alpha N$. For this to be a SPNE, we need to actually have both types of workers searching when $n_A = \alpha N$. As $\alpha > \frac{1}{2}$, if workers of type B search, both types

of workers search. The condition therefore directly derives from equation (3):

$$(1-\alpha) \geq \frac{s}{\lambda(V-v)} \tag{13}$$

$$\lambda \geq \frac{s}{(1-\alpha)(V-v)} = \lambda' \tag{14}$$

This means that workers' bargaining power must be high enough, so that the surplus from finding a good job is higher than the expected search cost. When $\lambda v < r$, condition (14) becomes, as from equation (5):

$$\lambda \geq \frac{s+(1-\alpha)r}{(1-\alpha)V} = \lambda'' \tag{15}$$

d. If only workers of type b search

In this last case, the respective expected profits are given by:

$$E(\pi|A) = \frac{\alpha M}{N}(1-b)V \tag{16}$$

$$E(\pi|B) = \frac{\alpha M}{N}(1-b)v + \frac{(1-\alpha)M}{N}\frac{(1-b)V}{1-\gamma}. \tag{17}$$

The condition of isoprofit is thus met when:

$$(1-\gamma) = \frac{(1-\alpha)V}{\alpha(V-v)}, \tag{18}$$

and this is a SPNE if for such a value of γ only workers of type b search, this is when the two following conditions are simultaneously met:

$$\lambda \geq \frac{\alpha s}{(1-\alpha)V} \tag{19}$$

$$\lambda < \frac{s}{\alpha[\alpha(V-v)-(1-\alpha)V]}. \tag{20}$$

Lemma 2 *There is no coalition-proof SPNE where only workers of type b search.*

Proof. If equilibrium (d) is a SPNE, this must imply that $\gamma < \frac{1}{2}$ (for workers of type a not to search). Hence, there always exists a self-enforcing coalition of employers of size $(1-\gamma)N$ who increase their expected profit by offering jobs in sector A and making workers of type a search. ■

4 Three theorems on bargaining power

By lemma 1 and 2, two candidates coalition-proof SPNE, (a) and (c), remain. A first general assessment of the respective efficiency of these equilibria is to measure the total surplus generated by the labor market, without considering the distribution. The main advantage of equilibrium (a) is that there is no search cost paid in equilibrium. The main advantage of equilibrium (c) is that all workers end up with a good match. Hence, it is easy to show that, following this criterion and when the initial bargaining power is such that $\lambda v \geq r$, equilibrium (c) should be preferred when:

$$\begin{aligned} \alpha V + (1-\alpha)v &< V - \frac{1-\alpha}{\alpha}s - \frac{\alpha}{1-\alpha}s \quad (21) \\ s &< \frac{\alpha(1-\alpha)^2(V-v)}{(1-\alpha)^2+\alpha^2}. \quad (22) \end{aligned}$$

When $\lambda v < r$, equation (22) rewrites:

$$s < \frac{\alpha(1-\alpha)^2 V}{(1-\alpha)^2+\alpha^2}. \quad (23)$$

The right hand side of those equations is decreasing in α for values of $\alpha \in (0, \frac{1}{2})$, the intuition being that the benefits from diversification are smaller when the share of workers of the minority type is smaller. In particular, diversification never increases aggregate surplus when $s > \frac{V-v}{2}$. A simple story could be that a social planner maximizing aggregate welfare should increase workers' bargaining to any level that allows sustaining (c) as an equilibrium when s is sufficiently small, even when it means transferring surplus from employers to workers. However, we can show that increasing workers' bargaining power is not a simple transfer among players that increases total welfare. Employers' can gain from workers' bargaining power, and workers themselves can lose.

Theorem 1 *In the absence of structural unemployment, increasing workers' bargaining power increases both the average wage and the (expected) profit of employers when (i) the initial value of λ is low enough, such that jobs are only offered in sector A, $\lambda < \frac{s}{(1-\alpha)(V-v)}$ and (ii) the initial value of λ is high enough, such that increasing the quality of matching compensates for employers' decreased bargaining power.*

It is not because unemployment is low that the market is efficient. Hence, when the market fails to properly match the workers, a policy of increasing workers' bargaining power could also increase the profit of employers, when the initial bargaining power was not too low. However, in this case, the classic tradeoff between frictional unemployment and the quality of jobs remains. In the presence of structural unemployment, the case for increased bargaining power is even more striking.

Theorem 2 *In the presence of structural unemployment, increasing workers' bargaining power increases average wages, (expected) profits and the total number of jobs when the initial value of λ is high enough, such that increasing the quality of matching compensates for employers' decreased bargaining power.*

Although this second theorem seems to suggest that the presence of structural unemployment reinforces the case for increased bargaining power, it may be misleading. Indeed, as there are several types of workers with different payoffs, the composition of the workforce matters.

Theorem 3 *For any pair $\{\hat{\lambda}, \lambda'\}$ such that increasing workers' bargaining power from any $\lambda \in (\hat{\lambda}, \lambda')$ to λ' increases employers' profits, there exists a value $\lambda_a \in (\hat{\lambda}, \lambda')$ such that, for any $\lambda \in (\lambda_a, \lambda')$, workers of type a are better off with bargaining power λ than λ'. In this case, the median voter opposes an increase in her own bargaining power, and in any bargaining power.*

What this theorem shows is that, paradoxically, the group that may hinder a reform of the labor market towards higher bargaining power for workers is precisely the largest group of workers. For instance, if workers are organised in unions, the workers of the majority type may have no incentive to support a policy that increases their expected search costs, even if it increases aggregate welfare and increases their own wage. This problem is not easy to solve for minority type workers. Assume these workers decide to lobby, alone, for an increase in their bargaining power. On one hand, this may increase their willingness to search for a given number of employers in sector B. On the other hand, this will decrease employers' expected profit in sector B, as the surplus extracted by employers from a good match in sector A becomes higher than the surplus they could extract in sector B. Therefore, the share of employers in sector B would be even lower than $1-\alpha$. This implies a higher search cost to be paid by a minority of workers, and the need for an even higher

bargaining power for them. Still, as long as condition (22) is fulfilled, there is room for increasing the total surplus. But if one needs to compensate the median voter for the increase in her search cost, this can only be done by (lump sum) money transfers that affect neither the type b workers' incentives to search, nor employers' incentive to offer jobs in sector B.

5 Additional results

It is also interesting to compare the bargaining power with the two other parameters than can be interpreted as the result of policy decisions: the minimum wage and the outside option. The tradeoff we are interested in is between frictional unemployment and the quality of matching, and how it affects the expected surplus of the different players. In our model, for a minimum wage w_{min} to have an impact on the economy it must meet the following condition:

$$w_{min} > max\{\lambda v, r\} \tag{24}$$

The minimum wage has an ambiguous effects on the market incentives to increase the quality of matching (and therefore, in our specification, frictional unemployment). On the one hand, employers have higher incentives to offer jobs in sector B, because the expected surplus they can extract from mismatched employees decreases. But, if those jobs are offered, and if workers of both types search for a good match, the surplus of a mismatch is not relevant anymore for the expected profit. On the other hand, those employees have lower incentives to look for the right job, because, by condition (24):

$$\lambda V - w_{min} < \lambda V - max\{\lambda v, r\}. \tag{25}$$

This last condition is what explains the following proposition.

Proposition 1 *An increase in the minimum wage (weakly) decreases the average quality of matching and the average level of frictional unemployment.*

Proof. If both types of workers are looking for the right job, the isoprofit conditions (11) and (12) are unaffected and, therefore, in equilibrium, $\gamma = \alpha$. However, the conditions on workers' bargaining power to search for the right job become more restrictive. In particular, equations (14)

and (15) rewrite:

$$\lambda \geq \frac{s+(1-\alpha)w_{min}}{(1-\alpha)v} > max\{\lambda', \lambda''\}. \tag{26}$$

Hence, by condition (24), if w_{min} has an impact, it is to violate the conditions leading to equilibrium (c), and therefore to decrease both the share of workers who search and the average quality of matching. ■

If the minimum wage decreases the quality of matching, the effect on majority type workers is ambiguous, following the logic exposed in Theorem 3. However, an increase in the minimum wage that does not decrease the average quality of matching makes workers of type b unambiguously better off.

Proposition 2 *A decrease in the outside option (weakly) increases total employment and has an ambiguous effect on the average quality of matching. If the quality of matching increases, the expected surplus of both types of workers unambiguously decreases. If the quality of matching decreases, only workers of the minority type are worse off.*

Proof. Assume the outside option decreases from r to r'. If $r > r' > \lambda v$, the outside option decreases the value of λ'' in condition (15). In this case, decreasing the level of the outside option increases the incentive of workers of the minority type to look for the right job, but also decreases the expected utility of those workers. The expected surplus of workers of the majority type decreases, as their expected search costs increase without compensation. If $r > \lambda v > r'$, the binding condition switches from (15) to (14), with either the end of structural unemployment and a decrease in the average quality of matching (if condition (14) is not met) or the end of structural unemployment and an increase in frictional unemployment that makes both types of workers worse off. Finally, if $\lambda v > r > r'$, the policy has no impact. ■

This policy is particularly relevant when considering the Spanish example again. A policy of decreased outside option may increase the number of jobs while hurting only minority type workers. This is a popular option, as it corresponds to the taste of the median voter, but it does not solve the main problem: the fact that workers of type b do not find jobs that correspond to their skills.

These two propositions illustrate the main differences between minimum wage, outside option and bargaining power. In particular, the increase in workers' bargaining power is the only policy that has the potential for Pareto-Improvements in our specification. While our setup is a two-types, two-sectors economy, the results could easily be extended to a larger number. Denote by $\alpha_i = \frac{m_i}{M}$ the share of workers of type i, employers will supply such jobs (and those workers will search in equilibrium) when, depending on whether $\lambda v \geq r$, either of those conditions is fulfilled:

$$\alpha_i \geq \frac{s}{\lambda(V-v)} \tag{27}$$

$$\alpha_i \geq \frac{s}{\lambda V - r}. \tag{28}$$

The difference is that the number of tradeoffs increases. Increasing the expected quality of matchings is more costly in terms of search costs when the share of workers of a given type is small. Therefore, it can be socially optimal (in the sense of Theorems 1 and 2) to increase workers' bargaining power up to a certain level (to allow the most represented types of workers to search), but without necessarily having all types of workers searching in equilibrium.

6 Conclusion

We have shown that, when considering the labor market as a game of horizontal matching between workers and employers, insufficient bargaining power for workers can lead to a reverse holdup problem: employers are not offering the efficient economic structure as they know workers will not search for the right sector. When the economy goes well, the wages of mismatched workers are low, but there is neither frictional nor structural unemployment. Even when increasing bargaining power increases matching quality, there is a tradeoff between better jobs and frictional unemployment. However, when the economy is going bad, mismatched workers are not productive enough anymore. In that case, increasing their bargaining power may lead to more jobs, better jobs, and higher profits for employers.

Although increasing workers' bargaining power emerges as a credible strategy to improve horizontal matching, there is a paradoxical risk associated with it. Indeed, even when it creates better jobs and leads to higher expected wages, a majority of workers may lose expected utility because their search costs increase in this more dynamic economy. In practice, this may lead a

majority of workers to oppose a policy that would increase their own bargaining power. These workers would enjoy a higher welfare in a world with fewer opportunities for newer workers or workers with new skills. Interpreting the game as 'older' and 'new' workers and sectors, it is worth noting that waiting for the minority skill to be a majority does not help. Indeed, if they become a majority, workers with 'new' skills will oppose any increase in the bargaining power that would help create jobs in an even 'newer' sector.

The specificity of our approach is the link we make between industrial and labor policy. The objective of the industrial policy is to switch production to the sectors that make the most of the skills of all types of worker as a way of increasing the productivity of the economy. The objective of labor policy is to ensure that all workers types eventually have employment opportunities. Our model allows us to explain why a standard democratic process may fail to reconcile both objectives as currently observed in many European countries unable to modernize and reduce unemployment. We show that the fear of a majority of workers to see their search costs increase can lead them to impose an inefficient industrial policy to achieve the labor policy goals. The key to reconciling the incentives of the median voter with the optimal industrial policy may come from social policy. In particular, a combination of increased bargaining power for all workers (i.e. their ability to explicitly link their salaries to profits in upswings as well as in downswings) with a lump-sum transfer from minority workers to majority workers may help. This is because it compensates the majority for their higher search costs in a more efficient economic structure while increasing employment opportunities for minority workers. In this quite common setting, industrial, labor and social policy can, thus, not be designed independently, if reforms are to be supported by the median voter. And this may be what many European countries have underestimated.

Bibliography

Acemoglu D. and R. Shimer, 1999. "Holdups and Efficiency with Search Frictions," International Economic Review, Vol. 40, No. 4, pp. 827-84.

Albrecht, J. and A. Bo, 1987. "An Equilibrium Model of Search Unemployment", Journal of Political Economy, 92(5), pp. 824-840

Bentolila, S., J.J. Dolado and J.F. Jimeno, 2012. "The *New* New Labour Market Reform in Spain: Objectives, Instruments and Shortcomings," CESifo DICE Report, Vol. 10 (2), pp3-8

Bernheim D., Peleg B. and M. Whinston, 1987. "Coalition-Proof Nash Equilibria. I. Concepts," Journal of Economic Theory, Vol. 42, pp. 1-12

Bhaskar, V. and T. To, 1999. "Minimum Wages for Ronald McDonald Monopsonies: A Theory of Monopsonistic Competition", The Economic Journal, 109, 455, pp.190-203

Brueckner, J., J.-F. Thisse and Y. Zenou, 2002. "Local labor markets, job matching, and urban location", International Economic Review, 43(1), pp.155-171

Burdett, K. and D. Mortensen, 1998. "Wage differentials, employer size, and unemployment". International Economic Review, 39(2), pp. 257-273

Cahuc P., Postel-Vinay F. and J.M. Robin, 2006. "Wage Bargaining with On-the-Job Search: Theory and Evidence," Econometrica, 74, 2, pp.323-364

Dolado J., Garcia-Serrano C. and J. Jimeno, 2002. "Drawing Lessons from the Boom of Temporary Jobs in Spain," The Economic Journal, 112, 480, Features, pp. F270-F295

Gall T., Legros P. and A. Newman, 2006. "The Timing of Education," Journal of the European Economic Association, 4, 2-3, pp.427-435

Hamilton, J., J.-F. Thisse and Y. Zenou, 2000. “Wage Competition with Heterogeneous Workers and Firms,” Journal of Labor Economics, vol. 18(3), pp. 453-72

Helsley, R. and W. Strange, 1990. “Matching and agglomeration economies in a system of cities,” Regional Science and Urban Economics, 20(2), pp.189-212

A. Manning, 2003. “The real thin theory: monopsony in modern labour markets,” Labour Economics, 10(2), pp. 105-131

A. Manning, 2011. “Imperfect Competition in the Labor Market," Handbook of Labor Economics Volume 4, Part B, pp. 973-1041

Marimon, R. and F. Zilibotti, 1999. “Unemployment vs. Mismatch of Talents: Reconsidering Unemployment Benefits,” The Economic Journal, Vol. 109, pp. 266-291.

Postel-Vinay F. and JM. Robin, 2002. “Wage Dispersion with Worker and Employer Heterogeneity,” Econometrica, 70, 6, pp. 2295-2350

Staiger, D.O., J. Spetz and C.S. Phibbs, 2010. “Is There Monopsony in the Labor Market? Evidence from a Natural Experiment,” Journal of Labor Economics, vol. 28(2), pp. 211-236

7 Technical Appendices

7.1 Proof of Theorem 1

This first theorem is about a world without structural unemployment. This happens either when both types of workers already search for the right job, or when no one searches and $\lambda v \geq r$. From the previous section we know we have to consider two equilibria: when bargaining power is low, all employers offer jobs in sector A, and when bargaining power fulfills condition (14), employers offer jobs in both sectors. The two equilibria can be simultaneously SPNE (from equation (8) and (14) this is the case for every λ satisfying $\frac{s}{(1-\alpha)(V-v)} \leq \lambda \leq \frac{nS}{V-v}$), but in this case only equilibrium (c) is coalition-proof (as the expected profit is higher). The first part of the theorem says that if both types of workers already search, increasing λ decreases the expected profit of employers. The second part of the theorem says that, if λ is low enough, so that no worker searches, there exist

values of λ such that increasing the bargaining power of workers to

$$\lambda' = \frac{s}{(1-\alpha)(V-v)} \tag{29}$$

increases both average wage and the expected profit. Increased bargaining power and better expected matching increase the average wage. It is thus enough to show that the expected profit increases for the statement to be true. This is the case when:

$$(1-\lambda')V \geq \alpha(1-\lambda)V + (1-\alpha)(1-\lambda)v. \tag{30}$$

As $V > v$, we can already see from equation (30) that, for every value of λ', there exist values of λ such that the profit increases. However, it is not the case when λ is too low. Replacing λ' by its expression, the exact condition is given by:

$$\lambda \geq 1 - \frac{((1-\alpha)(V-v)-s)V}{(\alpha V + (1-\alpha)v)(1-\alpha)(V-v)} = \hat{\lambda}. \tag{31}$$

Thus, (i) For any $\lambda' \in (0,1)$, $\exists\ \hat{\lambda} < \lambda'$ such that increasing workers' bargaining power from any $\lambda \in (\hat{\lambda}, \lambda')$ to λ' increases the expected profit of employers, (ii) λ' increases with α, as from equation (29), (iii) $\hat{\lambda}$ increases with λ' and α as from equation (30) and (iv) when α increases, the gap between $\hat{\lambda}$ and λ' decreases (as $\frac{d\hat{\lambda}}{d\lambda'} = \frac{V}{\alpha V + (1-\alpha)v} > 1$).

7.2 Proof of Theorem 2

If there is structural unemployment, this implies that $\lambda v < r$ and that condition (15) is not fulfilled, as a share of the workers take the outside option without searching. Therefore, increasing the workers' bargaining power to

$$\frac{s + (1-\alpha)r}{(1-\alpha)V} = \lambda'' \tag{32}$$

always increases the total number of jobs. For it to increase the expected profit, an additional condition (the intuition is similar to equation (30) applies:

$$(1-\lambda'')V \geq \alpha(1-\lambda)V \tag{33}$$

and, replacing λ'' by its expression yields the following condition on $\hat{\lambda''}$:

$$\hat{\lambda''} = 1 - \frac{(1-\alpha)(V-r)-s}{\alpha(1-\alpha)V}, \tag{34}$$

such that for any $\lambda'' \in (0,1)$, $\exists\ \hat{\lambda''} < \lambda''$ such that increasing workers' bargaining power from any $\lambda \in (\hat{\lambda''}, \lambda'')$ to λ'' increases the expected profit of employers. As in the world without structural unemployment, both λ and λ'' increase with α, and $\frac{d\hat{\lambda''}}{d\lambda''} > 1$.

7.3 Proof of Theorem 3

Workers of the majority type a are not necessarily better off when their bargaining power increase, as they now have to pay an expected search cost of $\frac{\alpha}{1-\alpha}s$. For any strictly positive value of s, there exists an ε sufficiently small for an increase in workers' bargaining power from $\lambda' - \varepsilon$ to λ' to decrease the expected surplus of workers of type a while increasing employers' expected profit. The general condition for the majority of workers to be worse off when their bargaining power increases from λ to λ' is:

$$\lambda V \geq \lambda' V - s\frac{1-\alpha}{\alpha} \tag{35}$$

$$\lambda \geq \frac{\alpha V s - (1-\alpha)s}{(1-\alpha)(V-v)\alpha V} = \lambda_a, \tag{36}$$

with $\lambda_a < \lambda'$. Intuitively, the higher the search cost s, the higher the risk that those majority workers lose from the economic diversification. As the median voter is, by definition, of the majority type, he will oppose any increase of bargaining power that decreases his own welfare. This result is identical regardless of the existence of structural unemployment.