Bargaining and the Differential Impact of Firing Transfers and Firing Taxes

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Abstract

We argue that, in employment and unemployment regressions, the pure tax component and the pure transfer component of employment protection need to be separated and interacted with measures of bargaining centralization. We perform an empirical analysis along these indications by using data that have been so far unexploited in the literature. Results are largely consistent with priors from recent theoretical results.

1   Introduction

Employment protection legislation (Epl) generates two types of costs for firms. The first type is made of mandatory transfers from the employer to the dismissed employee. Among these, severance payments represent the most obvious and relevant example. The second type is made of all those red tape expenses necessary to comply with procedural duties. Sometimes, economists emphasize the non-transfer nature of the latter by using the term of firing taxes.

In two early contributions, Lazear (1990) and Bertola (1990) study the consequences of transfers ad taxes respectively. More specifically, Lazear shows that transfers have no impact on labour demand because they can be undone through private wage contracts. This is only possible, however, if wages can be flexibly bargained between the employer and the employee. As for firing taxes, Bertola builds a fixed wage stochastic model and shows that these taxes reduce the volatility of labour demand and employment but have a positive impact on their average. This is due to the fact that firing taxes reduce layoffs during a slump as well as recruits during a boom, but the first effect dominates due to discounting.

In two more recent studies, Garibaldi and Violante (2005) and Piccirilli (2010) extend the analyses made in these early contributions.

Garibaldi and Violante study the mechanism of Lazear in a labour market with search frictions and jobs that can be either permanent or transitory. They show, inter alia, that transfers tend to be undone in markets where transitory wages can be freely bargained between employers and workers. In turn, since centralisation decreases the degrees of freedom of bargaining over transitory wages, a major result of the paper is that transfers are neutral in decentralised economies but are harmful for job creation in centralised economies.

Piccirilli extends the framework of Bertola by making wages endogenous. In this setting, the hold-up problem outlined in the insider-outsider story (Lindbeck and Snower, 1988) arises naturally. The outsider has an incentive to promise wage moderation once he becomes an insider while the insider has an incentive to renege on this promise. As a consequence, firms hold up on hiring.

Outsiders are obviously harmed by the hold-up problem unless they can not credibly commit over future wage moderation. Thus, the model predicts that the result of Bertola - i.e. firing taxes beneficial for labour demand - only arises in centralised economies. This is because centralisation favours the adoption of wage commitments and makes the hold up ineffective. By contrast, in decentralised economies, the hold-up remains effective so that the positive impact of firing taxes outlined by Bertola may be completely counteracted or even overturned.

From an empirical perspective, these recent findings suggest the following prescriptions. First, when assessing the impact on the performance of the labour market, employment protection should not be studied in isolation since what really matters is the interaction with the structure of bargaining. Second, the two components of employment protection should be studied separately because theoretical predictions are different. Transfers interact negatively with bargaining centralisation whereas taxes interact positively.

The contribution of the present paper is to conduct an empirical study in line with these prescriptions. For this purpose, we use two different measures of employment protection in order to capture the two key components. In addition, we interact both measures with

an index of *actual* bargaining centralisation which overcomes a major objection facing indexes of *formal* bargaining centralisation.

These elements of novelty are to be cast against the background of the existing empirical literature. On the one hand, the literature uses almost ubiquitously the Epl index produced by the Oecd. This index is accurate but it does not allow to distinguish the two components of protection[1]. On the other hand, in the existing literature, measures of protection are only rarely interacted with measures of bargaining centralisation[2].

2 Disentangling and Interacting

2.1 Data and Estimation Method

Firing regulations vary within each country according to a number of firm and worker characteristics. Therefore, to obtain comparable cross-country measures of labour market regulation, the World Bank (Doing Business project) evaluates national legislations by referring to a standardized firm-worker pair. Among the measures of regulation built by the WB through this method we choose the "difficulty of redundancy index" and the "redundancy cost indicator" to disentangle the two components of employment protection.

The first index is suitable to capture the size of firing taxes as it represents a standardized measure of the stringency and of the number of duties and requirements necessary to make a worker redundant. The index ranges from a maximum of 100 - workers can never be made redundant - to a minimum of 0 - workers can be made redundant at will without being obliged to inform third parties, to consult third parties, and to receive authorization from third parties.

The second variable, by contrast, is suitable to capture the size of transfers as it represents a measure of severance payments plus payments made during the notice period. The underlying assumption is that the redundant worker is totally unproductive so that the wage paid during the period of notice represents a pure monetary transfer. The measure is expressed in terms of weeks of salary. If, for instance, the advance notice is 1 month

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[1] Botero *et al.* (2004) and Feldman (2009) represent two exceptions. The first uses the measure of firing transfers - but not that of firing taxes - used in this paper. The second uses a survey-based subjective measure of firing restrictions.

[2] An exception is Bassanini and Duval (2006), a paper based on the Oecd Epl index though.

and severance requires 6 months of wage payments, the resulting cost measure is 30.1 (1 month = 4,3 weeks).

Information on the structure of bargaining and, more generally, on the institutional characteristics of the industrial relations environment are taken from the ICTWSS database (J. Visser, 2007)[3].

Traditionally, the notion of bargaining level and degree of centralisation have been regarded as overlapping. In this vein, countries with wages mainly bargained at firm level are considered decentralised while countries with wages mainly decided at the economy level are regarded as centralised. An intermediate position is taken by those countries where wages are mainly bargained at the level of single industries.

Confounding the concepts of centralisation and bargaining level, however, is not always warranted. In fact, a major measurement error arises when bargaining takes formally place within each single firm or establishment but economy-level confederations and/or industry-level unions are so powerful to exert a decisive influence over their lower level affiliates. In this case, bargaining is directed and governed in a centralised or quasi-centralised manner but, formally, it appears to be decentralised.

The measure of centralisation in the ICTWSS database (*Cent*) is built with the purpose of getting around the deceptions of formalism. In line with the observations made by Iversen (1999), the measure turns out to be a combination of an index of confederation/union concentration (Herfindal) and an index of confederation/union authority over affiliates. Thus, according to this measure, the degree of centralisation increases with confederation/union concentration and influence. Although concentration and influence may be correlated with the formal structure of bargaining in the real world, the index is in principle independent from the latter.

The evidence at the core of the paper derives from a panel of 26 countries that are observed over the period 2003-2007. All countries in the panel belong to the Oecd group so that measures of labour market performance and aggregate economic activity are all derived from the Oecd online database.

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[3]ICTWSS database= database on Institutional Characteristics of Trade Unions, Wage Setting, and Social Pacts.

The small number of countries is due to the limited coverage of the ICTWSS database[4]. In any case, working with a restricted number of countries is rather unavoidable. First, we would face a similar limitation had we adopted some other measure of bargaining centralisation (the Oecd centralisation index, for instance). Second, even if data were available for a larger set of countries, narrowing the study to the group of industrialized economies would still represent a sensible empirical strategy. For, in developing economies, the *de facto* regulation of the labour market is often only loosely related to the formal reading of rules.

Performance equations are estimated by using the random effect method implemented through a generalized least square procedure (GLS, Swamy-Arora method). This method exploits the longitudinal nature of data while controlling for country-specific heterogeneity in a parsimonious fashion. We check for correlation between time-varying regressors and country effects by computing the Hausman test according to the procedure developed in Arellano (2003, chap. 3). In addition to being particularly suitable in a small sample context, a further point of strength of this procedure is that it allows correction for heteroskedasticity (White method).[5]

2.2 Results

We use five performance variables: aggregate unemployment, prime-age male unemployment (age: 25-54), prime-age female unemployment (25-54), youth unemployment (15-24), and the employment-to-population ratio. The set of regressors contains the output gap, employment protection (firing taxes and firing transfers), bargaining institutions (centralisation, coordination and union density), labour taxation, unemployment benefits, a measure of State intervention in the economy, two dummies for southern and eastern European countries, and the key interactions between centralisation and protection measures. All institutional regressors - i.e. all regressors with the exception of the output gap

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[4]In addition to the 26 countries in the sample, the ICTWSS database contains 8 more countries (Bulgaria, Cyprus, Estonia, Latvia, Lithuania, Malta, Switzerland, and Slovenia). For these countries, however, the set of remaining regressors is not complete.

[5]The Hausman procedure of Arellano (2003) is suitable with small samples because, in contrast with the textbook procedure, it does not require the computation of the difference between the parameter variance-covariance matrices of fixed and random effects. In fact, contrary to asymptotic properties, the difference between the two matrices often turn out not to be positive definite in small samples.

- are lagged by one year.

Table 1 summarizes the evidence. With the exception of two cases, the interactions are all significant at conventional levels while their signs are always in line with the theoretical considerations outlined in the introduction. For countries with average firing taxes, above-average centralisation implies that firing transfers exert an above-average impact on unemployment. Also, for countries with average firing transfers, above-average centralisation implies that firing taxes exert a below-average impact on unemployment.

As for the remaining regressors, the signs of the coefficients are in general consistent with theoretical priors and with previous empirical findings. Their significance, however, falls below conventional thresholds due to the lack of sufficient variability. For all equations, the Hausman statistics (χ^2 distribution) does not reject the assumption of time-varying regressors being uncorrelated with country effects.

TABLE 1 HERE

We also conduct a number of robustness checks.

First, we check whether results are affected by the rather large correlation between the index of centralisation and *W.Coord* (see Table 4 in the data appendix). The latter is a discrete measure of whether bargaining takes place at the economy, industry or firm level. Thus, albeit it is referred as a measure of coordination by Visser (2007), *W.Coord* can be really regarded as a measure of *formal* centralisation. The measure ranges from a maximum of 5 if wage setting is fully centralised to a minimum of 1 if wage setting is decentralised at the level of single firms/establishments. To check for robustness, we estimate the same equations in Table 1 but drop *W.Coord* from the set of regressors. In addition, we run the same regressions of Table 1 but drop the variable *Centr* and use *W.Coord* as a measure of centralisation both in the set of regressors and in the computation of interactions. In the first case, results - that are not reported for brevity - show that key interaction coefficients are hardly affected in their sign, size and significance. In the second case, the substitution of *Centr* with *W.Coord* reduces the size of interaction coefficients but not their sign and significance. As a result, the overall picture of Table 1 hold almost unchanged.

Second, we follow a suggestion made in Braumoeller (2004) - a study dealing, inter alia, with inference problems in presence of two or more interactions - and include in the set of regressors the interaction between firing taxes and firing transfers and the three-way interaction among firing taxes, firing transfers and centralisation. In fact, Braumoeller forcefully argues that omitting interactions about which theory is silent amounts to impose an unwarranted restriction on the shape of the hyperplane that is used to describe data. The consequence is potential bias in estimated coefficients[6]. There is a drawback, however, from inserting "tacit" interactions as they cause multicollinearity. For this reason, we regard estimation with the complete set of interactions only as a robustness check rather than a source of our main results.

In panel a of Table 2, we present the results for the two key coefficients from equations that include all possible interactions. As for the unemployment equations, coefficients preserve their sign and increase in size and significance. By contrast, in the equation for the rate of employment, coefficients lose significance and appear to be consistent with theoretical priors only for their sign. Overall, the picture arising from the top panel of Table 2 does not contradict above comments based on Table 1.

In Table 2, panel b and c, we present results from equations that contain only a single interaction. We provide these results only for completeness but warn against any serious comment relying upon them. In fact, the overall evidence reported so far, and the above theoretical arguments, imply that equations with single interactions are likely to suffer from omitted variables bias. In any case, for the interaction between *Cent* and firing transfers, coefficients hardly change if the other interaction is dropped. By contrast, significance deteriorates for the interaction between *Cent* and firing taxes if the other interaction is dropped.

TABLE 2 HERE

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[6]Braumoeller (2204), pag. 811: "...The outcome is analogous to omitting the constant term from a simple bivariate regression, therefore forcing the regression line through the origin regardless of the pattern of the data: the consequences for inference may be negligible or severe."

3   Final Remarks

Recent theoretical contributions point to the relevance of the interaction between employment protection and bargaining centralisation while emphasizing the distinction between the tax and the transfer component of protection. These findings are in general not taken into account in empirical studies.

I this paper, we pursue the objective of assessing the empirical consistency of two theoretical predictions. First, firing transfers deteriorate labour market performance in more centralised economies. Second, firing taxes improve labour market performance in more centralised economies.

By using random effect estimation we show that these predictions are consistent with longitudinal data drawn from a sample of 26 developed countries.

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Data Appendix

Countries in the panel: Australia, Austria, Belgium, Canada, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Japan, Luxembourg, Netherlands, New Zealand, Norway, Poland, Portugal, Slovak Republic, Spain, Sweden, Switzerland, UK, USA.

Definition and Sources:

- Output Gap: difference between the average rate of growth in the last 10 years and the current rate of growth. Source: author's computations on World Bank annual growth series.

- Firing Taxes: "Difficulty of Redundancy Index". The index is built on the basis of a series of yes/no questions regarding the rules that govern redundancy. These questions are addressed to experts of national legislations. For instance, the first question has the objective of finding out whether redundancy is allowed as a basis for terminating workers. If redundancy is disallowed, the index takes its maximum value (100) and no further question is asked. If redundancy is allowed, other questions are asked to assess the constraints facing the employer. In this case, the value of the index results from the answers to these extra questions.

  For further details, see the document "Employing Workers Methodology" available at the website www.doingbusiness.org. Source: www.doingbusiness.org.

- Firing Transfers: "Redundancy Cost Indicator". The indicator measures the cost of advance notice requirements, severance payments and penalties due when terminating a redundant worker, expressed in weeks of salary.

  For further details, see the document "Employing Workers Methodology" available at the website www.doingbusiness.org. Source: www.doingbusiness.org.

- Bargaining centralisation: $Cent = \sqrt{CF_{authority}H_{cf} + AFF_{authority}H_{aff}}$. In the formula, $CF_{authority}$ and $AFF_{authority}$ represent indexes of influence over affiliates respectively for union confederations and single unions. By contrast, H_{cf} and H_{aff} represent the Herfindal concentration indexes respectively for confederations and single unions. By construction, the index ranges between a maximum of one and a minimum of zero; details available in Visser (2007). Source: ICTWSS database, Visser (2007).

- Wage Coordination: $W.Coord.$ is a discrete index spanning the range 1-5. $W.Coord. = 5$ means that wages are decided at the level of the whole economy between centralised workers and employers organizations. $W.Coord. = 1$ means that bargaining is fragmented at the level of single firms. Intermediate values represent intermediate centralisation patterns; details available in Visser (2007). Source: ICTWSS database, Visser (2007).

- Union Density: Net union membership as a proportion of wage and salary earners (percentage). Source: ICTWSS database, Visser (2007).

- Replacement rate: average unemployment benefit replacement rate across two income situations (100% and 67% of APW earnings), three family situations (single, with dependent spouse, with spouse in work) and three different unemployment

durations (1st year, 2nd and 3rd years, and 4th and 5th years of unemployment). Source: OECD, Benefits and Wages Database.

- Labour Tax: tax wedge between the employer labour cost and the corresponding net take-home pay of the employee for a single-earner couple with two children earning 100% of APW earnings. The tax wedge expresses the sum of personal income tax and all social security contributions as a percentage of total labour cost. Source: OECD, Taxing Wages.

- State Control: Index measuring state control over the economy, the index is a component of the Oecd PMR (Product Market Regulation) indicator. The State Control index results from three sub-indices. The first represents the fraction of sectors in the economy where the State controls at least one firm. The second measures the extent of public ownership in the energy, communications and transport sectors. The third measures the existence of government special voting rights in privately-owned firms. Source: Oecd.

- East: 0-1 dummy for Poland, Hungary, Slovak Republic and Czech Republic;

- Med: 0-1 dummy for Greece, Italy, Spain and Portugal.

Table 1: The Interaction between Centralisation and the two Components of Firing Costs

$Dep.Variable$	Unemployment	Male Un.	Female Un.	Young Un.	Empl. Rt.
$\widetilde{F.Tr.}$ x $\widetilde{Cent}$	.338**	.296***	.374***	.496**	-.199***
	(.109)	(.088)	(.122)	(.223)	(.066)
$\widetilde{F.Ta.}$ x $\widetilde{Cent}$	-.320***	-.312***	-.280**	-.482	.095
	(.151)	(.122)	(.160)	(.304)	(.144)
F. Transfers	.012	.018	.003	.018	.030
	(.022)	(.017)	(.025)	(.042)	(.032)
F. Taxes	.031	.026	.027	.051	-.008
	(.025)	(.020)	(.026)	(.049)	(.048)
Cent	3.890	2.703	5.272*	1.573	-1.548
	(3.039)	(2.356)	(3.064)	(5.604)	(1.839)
W.Coord	.162	.372	.062	-.064	-.320
	(.342)	(.275)	(.405)	(.689)	(.233)
Union Dens.	-.001	-.014	-.004	.075	-.042
	(.020)	(.016)	(.022)	(.053)	(.045)
State Interv.	-.092	-.421	.606	2.826	-4.411**
	(1.353)	(1.014)	(1.393)	(2.587)	(2.123)
Replacement Rt.	-.006	.002	-.012	-.046	-.008
	(.030)	(.022)	(.035)	(.064)	(.028)
Labour Tax	.068*	.070**	.057	.114	.012
	(.041)	(.032)	(.041)	(.089)	(.024)
Output Gap	.536***	.525***	.406***	.961***	-.329***
	(.170)	(.133)	(.172)	(.329)	(.072)
East	6.362***	5.306***	6.389***	11.280***	-11.313***
	(2.011)	(1.511)	(1.961)	(3.938)	(2.425)
Med.	.293	-1.674*	2.678*	4.353*	-5.029
	(1.325)	(0.917)	(1.632)	(2.643)	(3.396)
N. Obs.	104	104	104	104	104
N. Countries	26	26	26	26	26
R^2	.671	.705	.696	.698	.616
Standard Error	1.829	1.988	2.054	3.976	7.837
Wald	670.8***	673.3***	517.1***	758.4***	10392.8***
Hausman	6.28	7.69	5.97	5.69	6.28

Estimation Method: Random Effects, GLS Swamy-Arora procedure
Robust standard errors in parenthesis; *** 1% significance,** 5% significance, * 10% significance.
$\widetilde{X}$ represents the difference between X and its sample average.
All regressions include year dummies and a constant.

Table 2: Robustness Checks

	$Dep.Variable$	Unemp.	Male Un.	Female Un.	Young Un.	Emp. Rt.
Panel a						
Add $\widetilde{F.Tr.}$ x $\widetilde{F.Ta.}$ and	$\widetilde{F.Tr.}$ x $\widetilde{Cent}$	.724**	.648***	.709**	1.046*	.112
$\widetilde{F.Tr.}$ x $\widetilde{F.Ta.}$ x $\widetilde{Cent}$	$\widetilde{F.Ta.}$ x $\widetilde{Cent}$	-.428***	-.385***	-.398**	-.676**	-0.13
Panel b						
Only $\widetilde{F.Tr.}$ x $\widetilde{Cent}$	$\widetilde{F.Tr.}$ x $\widetilde{Cent}$	.264***	.211***	.328***	.406**	- .168***
Panel c						
Only $\widetilde{F.Ta.}$ x $\widetilde{Cent}$	$\widetilde{F.Ta.}$ x $\widetilde{Cent}$	-.204	-.196*	-.174	-.333	-.060

Table 3: Summary statistics

$Variable$	N. Obs.	Mean	Std. Dev.
un	104	6.88	3.183
maleun	104	5.22	2.652
femun	104	6.76	3.583
youngun	104	15.25	6.873
emprate	104	67.51	6.541
Firing Transfers	104	22.78	22.13
Firing Taxes	104	23.85	19.52
State Control	104	2.21	.572
Union Density	104	31.55	18.78
W. Coord.	104	2.93	1.241
Cent.	104	.42	.123
Replacement Rt.	104	26.43	12.699
Labour Tax	104	29.11	10.654
Output Gap	104	.26	1.375
$(\widetilde{F.Tr.} \times \widetilde{Cent.})$	104	.28	2.364
$(\widetilde{F.Ta.} \times \widetilde{Cent.})$	104	.92	2.400

Table 4: Correlation Matrix of Regressors

	1	2	3	4	5	6	7	8	9	10	11	12	13
1 (F. Trans.)	1												
2 (F. Taxes)	0.35	1											
3 (State Int.)	0.27	0.38	1										
4 (East)	-0.04	-0.14	0.27	1									
5 (Med)	0.42	0.35	0.41	-0.18	1								
6 (U. Dens.)	-0.17	0.05	-0.12	-0.24	-0.20	1							
7 (W. Coord)	0.06	0.45	0.18	-0.24	0.24	0.37	1						
8 (Cent)	0.10	0.39	-0.00	-0.31	0.02	0.35	0.55	1					
9 (Repl. Rt.)	0.16	0.28	0.01	-0.56	0.14	0.48	0.47	0.50	1				
10 (Wage Tax)	0.17	0.30	0.44	0.20	0.22	0.16	0.16	0.07	0.13	1			
11 (O. Gap)	-0.19	-0.01	0.06	0.46	-0.16	-0.01	-0.01	-0.05	-0.33	0.14	1		
12 (Cent*Trans.)	0.36	0.04	-0.07	-0.08	0.27	-0.21	-0.17	-0.41	-0.15	-0.20	-0.05	1	
13 (Cent*Taxes)	0.036	0.32	-0.24	0.01	-0.13	-0.14	-0.01	0.41	0.08	0.07	-0.13	-0.26	1