Scientific Research Publishing

Modern Economy, 2022, 13, 771-788
https://www.scirp.org/journal/me
ISSN Online: 2152-7261
ISSN Print: 2152-7245

Wage Bargaining and Welfare Benefits in the Time of Covid-19. Bipartite Sectoral Funds and Labor Market Equilibrium

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How to cite this paper: Croce, G., & Tilli, R. (2022). Wage Bargaining and Welfare Benefits in the Time of Covid-19 Bipartite Sectoral Funds and Labor Market Equilibrium. *Modern Economy, 13,* 771-788.
https://doi.org/10.4236/me.2022.136041

Received: April 22, 2022
Accepted: June 6, 2022
Published: June 9, 2022

Abstract

We provide a theoretical model of the employment effects of a tax-benefit policy implemented by Bipartite Sectoral Funds (BSFs), ruled by workers' unions and employers' organizations, based on a wage bargaining that includes the basic elements of a tax-benefit policy and allows for the equivalence of contributions and benefits. We show that employers and workers share the provision costs of the benefits and the institutional profile of the BSFs affects the degree of the equivalence of contributions and benefits. This may actually occur if 1) the exchange between wage and benefits is feasible in the context of current industrial relations; 2) the workers attach a sufficiently high value to the benefits; 3) BSFs are autonomous from Government interference.

Keywords

Bipartite Sectoral Funds, Tax-Benefit Policy, Labor Taxation, Social Contributions

1. Introduction

In recent decades, social policies have run into difficulties because of the structural trends affecting European societies, such as population ageing, the increase in female labor market participation and the widespread fear of employment instability. Such changes prompt larger demand for social services and benefits, but public budget constraints and the need to cut production costs to defend competitiveness in global markets make it more difficult to accommodate this demand.

In European countries, employers' organizations and unions jointly manage a number of sectoral funds. These Bipartite Sectoral Funds (BSFs) are institutions established in a collective agreement between unions and employers' organizations, managed by them through bipartite governance, to provide a variety of social benefits to the workers and their families. They are financed through contributions mostly paid by the employers. One of their features is that seats on the governing boards are usually equally split between unions and employers' representatives. BSFs represent a major change in the governance structure of welfare systems and a possible departure from the traditional Bismarckian model towards more self-regulatory, collectively agreed arrangements (Ebbinghaus, 2010a).

This paper focuses on the employment effects of tax-benefit policies implemented by BSFs in the context of collective bargaining and provides a theoretical analysis of its implications for the labor market. The new idea is not on the specific contribution that welfare benefits can have in support of public policies, but on the analysis of the effect that they can produce on employment and the structure of the labor market.

Our main argument is that the institutional profile of BSFs may favor the equivalence between contributions and benefits by the unions so that employers and workers share the costs of the benefits.

By equivalence between contributions and benefits, we mean that unions evaluate the benefits provided to the workers by BSFs and their availability and their amount are directly linked to the social contributions paid by the employers to the funds. As we will show below, the typical tax-benefit scheme managed by BSFs, and their peculiar governance, make this equivalence effect possible. This occurs when the unions accept a wage moderation shifting part of the burden of the social contributions paid by the employers into the wage. Thereby, the impact of social policies on labor costs and on employment is likely to be less severe when compared to a payroll tax paid to the government. Our analysis suggests that BSFs may represent an institutional device able to cushion the adverse effects of payroll taxes.

According to the existing literature, only perfectly competitive labor markets or, conversely, corporatist economies are able to favor the equivalence of contributions and benefits, while we argue that also BSFs make the equivalence effect possible.

The emergency caused by the Covid-19 pandemic has emphasized the role of cooperation and collective agreements between workers and the employer as a pillar of resilience. Moreover, in sectors where economic recovery following the easing of the distancing measures has led to skill shortages and increased resignation rates, the provision of welfare benefits by the employer or through BSFs can help firms to attract or retain workers.

The paper is organized as follows. The next section introduces what we mean by equivalence between contributions and benefits and briefly discusses its role in the light of the economic literature. Section 3 sets out a simple economic

model showing how a typical BSF's tax-benefit policy may favor the sharing of the cost of social contributions and a lower impact on employment. Section 4 discusses the conditions required in order to strengthen the equivalence effect. Finally, the last section concludes and points out possible critical drawbacks.

2. Welfare Benefits Provided by the Employer: Wage Bargaining and the Labor Market

In this section, we review the economic literature on social policies, highlighting the role of trade unions, collective bargaining and labor taxation in influencing wages and employment and providing some preliminary stylized data on welfare benefits provided by the employers. Furthermore, we describe two nationwide experiences of pure BSFs managed exclusively by trade unions and firms implemented by Sweden and France.

2.1. Social Policies, Unions, Collective Bargaining and Labor Taxation

Reforms of social policies and their financing have been advocated in order to mitigate their alleged adverse effects on economic growth and employment (OECD, 1994; Carone & Salomäki, 2001). Not only the Governments but also unions and employers' organizations play a role in the evolution of welfare policies, taking initiatives at national and local level (see, among others, Tachibanaki, 2003; Ebbinghaus, 2010a; Ferrera & Maino, 2014).

Natali and Pavolini (2014) evaluate the incidence of welfare programs jointly delivered by the social partners in selected manufacturing and services industries in a number of European countries, finding that healthcare, reconciliation between work and family and continuous training cover a substantial share of workers. Furthermore, these programs usually supplement rather than substitute public policies. Ebbinghaus (2010a) shows that when social partners assume a leading role in occupational social security schemes, they are able to incorporate them into the wage bargaining. In accordance with this view, we argue that a tax-benefit policy managed by the social partners through BSFs and strictly tied to collective wage negotiations strengthens the link between contributions and benefits.

Closely related to the contents of this paper is the incidence of labor taxes and their effects on labor market equilibrium, in particular, if they may shift to net wages or, conversely, raise labor costs. In general, the financing of benefits through social contributions formally charged to the employers raises the labor cost and exerts a harmful effect on employment.

The standard analysis, which applies to a perfectly competitive labor market and fully flexible wages, states that an increase in the non-wage labor costs reduces the labor demand, cutting down both the net wage and the employment level. That is, labor taxes do not harm employment only with rigid labor supply (so that the workers get a job for every level of wage) and flexible wage (so that it can decrease of the same amount of the tax).

However, these conclusions are meaningless for economies where wages are set by collective bargaining so that the effect of a payroll tax on employment depends on the model of wage bargaining (Goerke, 1996; Koskela, 2001). Moreover, following Calmfors and Driffil (1988), the degree of bargaining centralization may have substantial implications. The ability of the union to avoid a wage reduction after an increase of a payroll tax is the lowest with highly decentralized bargaining and it increases with the degree of centralization (Daveri & Tabellini, 2000). As a consequence, the impact on employment is lower in highly decentralized economies whereas it becomes more severe in more centralized ones.

Particularly important in this context is the perception of the benefits that the worker obtains by paying the tax. In a perfect competition context, if the workers value positively the benefits, they accept wage moderation and the net wage absorbs a larger portion of the tax so that the drop in employment is smaller. If the workers value the benefits as much as the value of the tax, the wage reduction is equal to the amount of the tax and the employment level stays unaffected (Gruber & Kruger 1990; Gruber, 1997).

We can obtain this result even in a unionized labor market. Several authors have argued that the relationship between centralization and the size of employment loss is not monotonic but hump-shaped (Summers et al., 1993; Alesina & Perotti, 1997). With a nationwide centralized wage bargaining, the union internalizes the Government budget as it recognizes that a tax increase will turn into higher social expenditure to the advantage of its members.

Mares (2004) argues that a union may be willing to offer wage moderation in return for social benefits showing that the degree of compensation decreases with the level of decentralization of wage bargaining. With many small unions, the link between taxes and benefits tends to vanish as the benefits received by the members of each union do not depend on the taxes paid by their employers.

As for the empirical evidence, the issue of the incidence of labor taxes and their impact on employment remains somewhat controversial. Daveri and Tabellini (2000) find evidence of wage resistance (a shift of taxes on to labor costs) causing a long-lasting effect of taxes on unemployment, especially in Continental European countries. Arpaia and Carone (2004) find that a limited impact of the tax wedge on labor costs can only be detected in the short term, while in the long run it tends to disappear. Azemar and Desbordes (2010) find that, in countries where bargaining is not highly coordinated, in the long run 55% of an increase in non-wage labor costs is shifted to the workers while the remaining 45% inflates the labor costs; in countries with a highly coordinated wage bargaining, instead, a tax increase is fully shifted to workers by a wage reduction. Finally, the meta-analysis run by Melguizo and González-Páramo (2012) shows that over the long term employees bear two-thirds of the tax burden in both Continental European and Anglo-Saxon economies, and nearly 90% in Nordic ones, while the shift is limited to less than 50% in the short term.

2.2. Some Preliminary Stylized Facts

Furthermore, no comparative measures of the diffusion of BSFs and their weight in terms of affiliated employers and workforce or the financial resources collected and spent are available (OECD, 2007; Adema et al., 2011). The better, although very tentative, available approximation of the extent of this area of social policy is given by OECD data on the voluntary social expenditure, that is the social benefits provided by the employers according to collective agreements, signed at national, sectoral and enterprise level, or also unilaterally. Even though such data cannot be taken as an exact measurement of the diffusion of the bipartite schemes, they offer useful insights about the relative weight of social policies arising from labor relations and relying on private resources across countries (Adema & Einherand, 1998; Seeleib-Kaiser & Fleckenstein, 2009; Natali & Pavolini, 2014).

Table 1 shows the five-year average of the voluntary private social expenditure in percentage of GDP from 1990 to 2017 for the main European countries. As can be seen, up to 2014 for most countries there was a slow but steady growth, with a slowdown in the last period 2015-17, with the exception of Italy and Portugal. Netherland, France, Sweden, UK and US remain the countries with the highest values, while Italy ranks last with values below 1%.

Just about Italy, of particular interest for the purposes of our work is the report produced by Generali (2020) with the participation of the major Italian

Table 1. Voluntary private social expenditure in percentage of GDP (5 years average).

	1990-94	1995-99	2000-04	2005-09	2010-14	2015-17
Austria	1.1	1.0	1.1	1.2	1.4	1.4
Belgium	1.9	1.9	2.1	2.2	1.9	1.9
Denmark	5.2	4.6	4.1	2.8	2.4	1.8
Finland	1.3	1.4	1.3	1.3	1.4	1.4
France	2.1	2.3	2.8	3.2	3.5	3.1
Germany	1.7	1.7	1.9	1.8	1.2	1.2
Ireland	1.4	1.5	2.6	2.3	3.0	2.1
Italy	0.5	0.4	0.5	0.6	0.7	0.9
Netherlands	5.5	6.2	6.9	6.5	7.0	6.9
Portugal	0.7	0.9	1.4	1.6	1.7	2.1
Spain	0.2	0.3	0.4	0.5	1.3	1.3
Sweden	1.8	2.1	2.1	2.5	3.2	3.4
United Kingdom	5.3	5.5	5.6	4.9	5.4	5.2
United States	7.8	8.5	9.3	10.1	10.1	6.0

Source: OECD Social Expenditure Statistics.

employers' organization.[1]

The results show good prospects for corporate welfare, also to help overcome the Covid-19 pandemic crisis.

Small and medium-sized firms active in Italy in corporate welfare increased from 7.2% in 2016 to 22.2% in 2020. Firms consider positive the effects of corporate welfare for 34.4% of cases on labor productivity, 38.5% on employee satisfaction and 38.7% on the image and reputation of the firm.

The Covid-19 crisis runs as an accelerator of corporate welfare. The report shows that about 80% of firms despite the crisis have confirmed all the pre-existing welfare initiatives, while in 27.7% of cases they have introduced new ones or have strengthened those already in progress.

Moreover, the actions implemented to face the Covid-19 emergency have enriched and strengthened corporate welfare. 40.8% of these, in fact, have assumed a structural character and the firms intend to maintain them even after the emergency will be overcome.

2.3. Two Examples of Pure BSFs

A noteworthy example of a "pure" bipartite fund is *Trygghetsrådet* (TRR), one of the most important Swedish *Job Security Councils* (Diedrich & Bergström, 2006). This organization has an intersectoral scope as it covers all white-collar workers in the private sector. A prominent mission of the TRR is to provide replacement services such as personalized coaching and unemployment benefits to displaced workers in the event of collective redundancies due to corporate restructuring or macroeconomic slumps. All benefits are financed from employers' contributions. A mutualistic principle applies to the allocation of resources among recipients and only insiders are entitled to benefit from its services and subsidies (Bergström, 2009). Both wages and contributions to the TRR are negotiated as elements of the same bargaining process (Sebardt, 2005).

Far from the "pure" model, a more spurious example of bipartite fund is the *Fonds paritaire de sécurisation des parcours professionnels* (FPSPP), an organization that plays a key role in the French continuous training system (Mosley et al., 1998). Its funding does not come directly from employers, but from the sectoral paritarian organizations (OPCAs) charged with collecting the legally-established mandatory contributions from employers (CNFPTLV, 2012). It also receives some additional funds from the European Social Fund.

This institution, firstly introduced by a national collective agreement, was created to tackle serious imbalances in the allocation of training between better-qualified and more disadvantaged groups of workers. It may be said that the

[1]This report aims to disseminate and enhance the corporate welfare culture in Italian small and medium-sized firms, through an analysis that evaluates the level of corporate welfare proposed by each individual company analyzed and expresses with an individual score: the PMI Welfare Index. This score is obtained by an algorithm that considers more than one hundred variables and 12 areas of intervention in the field of corporate welfare. To create the 2020 index, over 6,500 Italian firms from all production sectors were interviewed about the initiatives they have implemented for employees in various fields.

FPSPP was set up with the pre-eminent purpose of redistributing training opportunities from insiders to outsiders (Méhaut, 2005; CESE, 2011). As a consequence, a large portion of the resources accruing to the FPSPP is devoted to job-seekers and other vulnerable groups. In addition, during the Great Recession, the Government diverted large amounts of resources from the FPSPP to *Pole emploi*, the French public employment service. A permanent struggle is under way between social partners and the Government regarding the allocation of the resources at the disposal of the Fund, with the former aiming to benefit contributing firms and workers, and the Government being more interested in helping outsiders. Two representatives of the Government sit on the Board of the FPSPP and may veto any proposal discussed by it. This veto has actually been exercised, so that one may conclude that the Government can interfere heavily in the decision-making process.

In the next section, we provide a model showing how a tax-benefit policy managed by a BSF affects collective bargaining. Our results show that the tax-benefit policy implemented by the BSF may strengthen the link between contributions and benefits and the institutional architecture of the BSF favors the shift of the tax burden on to the wage. Moreover, if the sharing cost of the social contribution between employers and workers lessens the labor cost increase, the impact of the contribution on employment is lower than in the case of a payroll tax applied by the Government.

3. The Model

The model builds mainly on Summers et al. (1993), Booth (1995), Goerke (1996) and Ooghe et al. (2003). Its setup captures some of the main features of the European context, where wages are bargained through collective negotiations and the scope of negotiations between social partners extends beyond pay (Boeri et al., 2001; Ebbinghaus, 2010b).

3.1. Firm's Profits and Union's Utility

Consider the firms operating in a given economic sector where unions and employers have established a BSF managing a tax-benefit scheme. Assume the tax (corresponding to a social contribution) proportional to the wage and formally charged to the employer. This tax does not flow into the public budget but is earmarked for the benefits provided to the employees of the affiliated firms by the BSF. For sake of simplicity, we omit payroll and labour taxes and benefits established by the Government, and assume that the unemployment subsidy is not taxed.

The aggregate tax revenue in the sector amounts to wtN, where $N = \sum_j n_j$ with n_j representing the employment in the j-th firm. The moneys spent to provide the social benefits to the employees (those belonging to the firms of the sector) amounts to γwtN which is lower than the tax revenue ($0 \le \gamma \le 1$) by assumption. The remaining part of tax revenue is equal to $K = (1-\gamma)wtN$

which corresponds to the administration cost incurred by the BSF and to money that BSF may spend on benefits to the employees in other sectors or people out of the workforce. Thus the BSF budget constraint is given by $wtN = \gamma wtN + K$.

Moreover, the value that the workers attach to the benefits is equal to $sN = \varphi\gamma wtN$, with $0 \le \varphi \le 1$, that is the value of the benefits entering the utility function of the workers does not necessarily corresponds to the cost of them. Furthermore, we assume that the employees in the sector are homogeneous and get the same value of the per-worker benefit *s*. We may write $\delta = \varphi\gamma$, so that the per-worker benefit is $s = \delta wt$. According to our assumptions, δ takes a value between 0 and 1. At one extreme, $\delta = 0$ if $\gamma = 0$, that is all the resources are absorbed by the term *K*, or $\varphi = 0$, if the workers do not appreciate at all the benefits. At the other extreme, $\delta = 1$, if $\gamma = 1$ and $\varphi = 1$: in case there are no costs and no redistribution to outsiders and the workers attach to the benefits their full value (equal to their cost).

The coefficient δ plays a relevant role in the model as it measures how large can be the equivalence between benefits and contributions by the union. Its value depends not only on the amount of social expenditure in favour of the employees, but also on the quality of the benefits as perceived by the workers and on the institutional features affecting the strength of the link between the social contribution paid by the employers and the benefits.

Moreover, we assume that some of the benefits entering the utility function of the workers may affect also the firm profits. In particular, we consider their productivity-enhancing effect.[2] The sum of money financing them is assumed to be *aN*, which is fixed by the BSF as a part of its social expenditure so that $aN \le \gamma wtN$. Then *a* corresponds to the given value of the per-worker labour productivity-augmenting benefit.

As the employer formally pays the tax, the profit function Π of the representative firm as in the following:

$$\Pi = A(a)y(n) - w(1+t)n \tag{1}$$

where $y(n)$ (with $y'(n) > 0$ and $y''(n) < 0$) is the production function, *n* the employment and *t* the tax rate. The term $A(a)$ (with $A'(a) > 0$ and $A''(a) < 0$) is the effect of the productivity-enhancing benefit *a*.

Each firm in the sector produces the same identical good, at a price exogenously fixed in the international market and normalized to 1.[3]

The labour force amounts to a given quantity *l*. When employed, the worker receives the net wage *w* plus the social benefit*s*, provided by the BSF. If the worker does not find a job, he/she may obtain the unemployment subsidy *b* pro-

[2]This is a realistic assumption in the context of private collectively agreed tax-benefit policies. A short list of benefits affecting both the workers' welfare and labour productivity includes support to workplace training and innovations adoption which foster the employees' involvement as well as their skills, services helping the reconciliation between work and family duties which may reduce absenteeism and workforce turnover, programs aimed at improving health and safety at work. All these measures increase skills, effort and productivity.

[3]This assumption rules out the possibility that the tax is forward-shifted to the consumers via a price increase.

vided by the Government. Neither the wage nor the unemployment subsidy is taxed. We can therefore write the risk-neutral union's utility function as:

$$U = [w+s]n+(l-n)b$$

The term K can be given different meanings. It may represent the costs of administration of the tax-benefit policy. In this case it measures how efficient the BSF is in running the policy. It might also reflect the redistributive bias of the BSF. In this view, K includes also the amount of resources targeted to outsiders rather than regular employees of affiliated firms. Indeed, in some cases the Government may force the BSF to target specific groups of recipients, like unemployed or others. More in general, it measures the amount of the tax revenue which have been distorted away from the affiliated employers and their employees.

Substituting the per-worker benefit s by δwt the worker's total compensation is $w(1+\delta t)$ and the utility function can be written as:

$$U = [w(1+\delta t)-b]n+lb \tag{2}$$

According to the theoretical predictions reviewed in the previous section, it should be expected that, apart the extreme cases of a perfectly competitive labor market or of national-level bargaining, in the general case of a Government tax funding the public budget, δ tends to be low. Conversely, in the case we are considering of the tax collected by a BSF with the purpose of delivering benefits to the employees in the same sector, the value of δ is higher. In short, we refer to the coefficient δ as a measure of the equivalence between benefits and contributions.[4]

3.2. Bargaining over Wage and Employment

Firms and unions bargain over both wage and employment according to the efficient contracts model. If the parties fail to reach an agreement, the firm makes zero profits while each workforce member gets the subsidy *b*. Then $\bar{\Pi}=0$ and $\bar{U}=lb$ are respectively the disagreement outcomes for the two parties. In the efficient contracts framework they have to maximise the Nash product, hence they face the following problem:

$$\max_{w,n}\left(U-\bar{U}\right)^{\beta}\left(\Pi-\bar{\Pi}\right)^{1-\beta} \tag{3}$$

where β denotes the union's relative bargaining power. From the first order conditions we get:[5]

$$\beta[A(a)y(n)-w(1+t)n](1+\delta t)-(1-\beta)(1+t)[w(1+\delta t)-b]n=0 \tag{4}$$

$$\beta[A(a)y(n)-w(1+t)n]+(1-\beta)[A(a)y'(n)-w(1+t)]n=0 \tag{5}$$

Simple manipulations of (4) and (5) yield the equation of the contract curve

[4]Thus, it reminds the "encompassment" coefficient considered by Summers et al. (1993) and the "reciprocity" term of Ooghe et al. (2003).

[5]Second order conditions for a maximum are also satisfied.

(CC):

$$A(a)y'(n)=\frac{1+t}{1+\delta t}b \tag{6}$$

that is the locus of pairs (w,n) corresponding to all possible outcomes of the efficient bargaining. Indeed, equation (6) can be derived from the tangency of firm's isoprofits curves and the union indifference curves. As known, under the assumption of the union's risk-neutrality, the CC is vertical, meaning that the employment is independent from the wage level.

In order to identify the equilibrium wage point along the CC we can derive the so called rent division curve (RDC) from Equation (4):

$$w=\beta\frac{1}{1+t}\frac{A(a)y(n)}{n}+(1-\beta)\frac{1}{1+\delta t}b \tag{7}$$

According to (7) the bargained wage, depending on the relative bargaining power of the parties, lies somewhere between $\frac{1}{1+t}\frac{A(a)y(n)}{n}$, the maximum wage that the firm may pay without incurring negative profits, and $\frac{1}{1+\delta t}b$, the minimum wage that the firm has to pay in order to retain the worker. This curve is downward sloped as results from:

$$\frac{\mathrm{d}w}{\mathrm{d}n}=\beta A(a)\frac{y'(n)-y(n)/n}{(1+t)n}<0 \tag{8}$$

(the negative sign follows from the fact that $y'(n)<y(n)/n$ under the assumption $y''(n)<0$).

Using Equations (6) and (7) the equilibrium wage is given by:

$$w^*=\frac{A(a)}{1+t}\left[\beta\frac{y(n)}{n}+(1-\beta)y'(n)\right] \tag{9}$$

where the term in square brackets is the weighted average of the mean and the marginal labour product. The equilibrium outcome of bargaining is given by point A in **Figure 1**, corresponding to the intersection of the two curves, CC and RDC.

4. Comparative Statics

We may now predict how the exogenous variables of our model affect equilibrium employment and wage. Following Goerke (1996), we single out the shifts of the CC and the RDC in order to detect the effects behind net changes in the equilibrium values.

Three propositions summarize our results.

Proposition 1: an increase in the tax rate causes: 1) a reduction of the employment level (as long as $\delta<1$); 2) a decrease in wages (if the elasticity of employment to tax rate is not too large).

Proof: taking the derivative of the CC curve with respect to t, by the implicit function theorem we obtain:

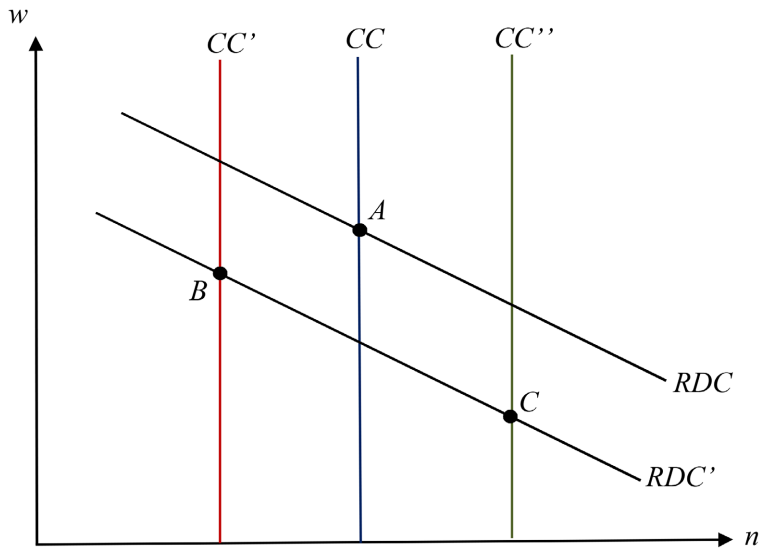

Figure 1. Labor market equilibrium.

$$\frac{\mathrm{d}n}{\mathrm{d}t}=\frac{1-\delta}{(1+\delta t)^2 A(a) y''(n)} b<0 \tag{10}$$

meaning that a rise in the tax rate causes the employment level to shrink (as long as $\delta<1$), pushing the CC leftwards as shown by **Figure 1**. If $\delta=1$ the employment does not fall after a tax rate increase. To grasp the intuition behind this result it is worth considering that the parties bargain on employment and wage to reach a Pareto-efficient outcome. After a tax increase the value of n in terms of w for the employer is higher than for the union, then they find convenient to reduce n. This restores the equality of the slopes of the isoprofit and the indifference curve.

Moreover, a higher coefficient δ cushions the negative impact of a rise in the tax rate on employment as shown by:

$$\frac{\partial(\mathrm{d}n/\mathrm{d}t)}{\partial\delta}=\frac{-\left[(1+\delta t)^2 A(a) y''(n)\right]-2(1-\delta)(1+\delta t) A(a) y''(n) t}{\left[(1+\delta t)^2 A(a) y''(n)\right]^2} b>0.$$

To analyze the effects on the bargained wage we must now turn to the RDC. By taking its derivative with respect to t, the effect of an increase in the tax rate, holding the employment level fixed, is:

$$\frac{\mathrm{d}w}{\mathrm{d}t}=-\beta\frac{1}{(1+t)^2}\frac{A(a) y(n)}{n}-(1-\beta)\frac{\delta}{(1+\delta t)^2} b<0 \tag{11}$$

According to (11), if t rises the wage along the RDC lowers for each given employment quantity.

Combining the shifts of the two curves, the new equilibrium is at lower employment while, unfortunately, the sign of the change in the equilibrium wage remains uncertain. The sign of the net effect of a change in t on the equilibrium wage depends on the extent to which the tax rate rise affects employment. If the

employment fall is not too large, the wage diminishes.[6]

Figure 1 displays how the equilibrium moves from point A to point B, with a lower employment level, as a result of a higher tax rate.

Proposition 2: a higher degree of equivalence of contributions and benefits (coefficient δ): 1) rises the employment level; 2) decreases the wage for each given tax rate.

Proof: taking the derivative of (7) with respect to δ for a given value of w, the implicit function rule applied to the CC equation yields:

$$\frac{\mathrm{d}n}{\mathrm{d}\delta} = -\frac{(1+t)t}{(1+\delta t)^2 A(a) y''(n)} b > 0 \tag{12}$$

According to (12), employment increases with δ and the CC curve shifts to the right. That is, a larger equivalence of contributions and benefits, as measured by coefficient δ,prompts the union to substitute the wage with the benefit. In other words, a higher valuation of the benefits increases the relative value of employment for the union so that it is willing to accept a lower net wage in order to gain more employment.

Taking the derivative of (7) with respect to δ holding n fixed, we obtain:

$$\frac{\mathrm{d}w}{\mathrm{d}\delta} = -(1-\beta)\frac{t}{(1+\delta t)^2} b < 0 \tag{13}$$

Equation (13) states thatthe wage decreases for each given employment level when the level of δ increases (the RDC curve shifts downwards). The intuition is that, as the value of the benefit received by the worker increases with δ, a rise in δ lowers the minimum net wage necessary for the firm to retain the worker, given the subsidy b.

Then higher employment and a lower wage result from the combination of the rightward move of the CC and the downward shift of the RDC (in Figure 1 the equilibrium moves to point C).

Proposition 3: a higher value of the per-worker productivity-enhancing benefit (coefficient a): 1) rises the employment level; 2) increase the wage for each given tax rate.

Proof: A reallocation of the BSF resources in favor of the benefits pursuing a productivity increase, it is likely to affect the outcomes of the next bargaining round. We may take the derivatives of n and w with respect to a. From the CC, through the implicit function rule, we obtain:

$$\frac{\mathrm{d}n}{\mathrm{d}a} = -\frac{A'(a) y'(n)}{A(a) y''(n)} > 0 \tag{14}$$

where the positive sign follows from the assumption of concavity of $y(n)$. According to this result, we should expect a higher employment level if resources are reallocated by the BSF towards measures improving skills and effort (the CC

[6]Ooghe et al. (2003) show that the case of a negative effect of a change of t on $w$can be taken as more relevant as the required analytical condition for it is consistent with most used production functions.

shifts rightwards).

At the same time, an increase in a exerts an upward pressure on the RDC, as revealed by:

$$\frac{\mathrm{d}w}{\mathrm{d}a} = \beta \frac{1}{1+t} \frac{A'(a)y(n)}{n} > 0 \tag{15}$$

following the fact that a higher value of a increases the highest wage that the firm may pay without incurring in negative profits.

Then a higher a is associated to a higher w for each employment level (the RDC shifts upwards). As a consequence, an increase in a could move the equilibrium towards "north-east" in **Figure 1**, with more employment and a higher wage. However, taking into account that the RDC curve has a negative slope, the final effect on the equilibrium wage cannot be predicted a priori. Moreover, as it results from the derivative of (8) with respect to a, the RDC curve becomes steeper as a increases. What these results make clear is that a shift of the BSF expenditure towards productivity-enhancing measures represents an employment-friendly policy option.

Summarizing, Propositions 1 and 2 state that an increase in the tax rate pushes the equilibrium further away from the case with no tax, negatively affecting employment and (likely) reducing the net wage. On the other hand, a larger equivalence between benefits and contributions by the workers reduces the distortional effect of the tax on the employment level and prompts the union to share the costs of the benefits as the burden of the tax that the employer is formally charged with partially (or fully, with $\delta = 1$) shifts into the wage. Furthermore, as Proposition 3 states, an increase of the per-worker productivity-enhancing benefit has a positive effect on employment level and wage.

These results suggest that if a tax-benefit policy managed by social partners through a BSF allows a large equivalence between benefits and contributions, then it might be less harmful to employment than a social policy financed through a payroll tax levied by the Government.

Moreover, we can see the cost-sharing resulting from bargaining as an economic rationale for the bipartite governance of the BSFs. From this perspective, the sharing of decision-making power between the social partners ensues from the sharing of the financial burden.

5. Conditions Required for the Equivalence between Benefits and Contributions

The equivalence between benefits and contributions and the cost sharing of the social policy between employers and workers can occur only under specific conditions. Referring to our model, these conditions are necessary to ensure that the coefficient δ takes a large value. Actually, according to our results, the employment level in the model is positively affected also by the term a.

However, for each given value of a, the equivalence between benefits and contributions depends on the following three conditions.

Firstly, the exchange between wage and benefits has to be feasible in the context of the current industrial relations. To this end, it is required that collective negotiations extend beyond wage bargaining, covering also the main elements of the tax-benefit policy, in particular the amount of the contributions to be paid. This implies that the parties involved in the wage bargaining must be the same as those who sign the collective agreements concerning the tax-benefit policy. In particular, the wage and the policy elements must be negotiated at the same (company, sectoral, territorial) level.

Secondly, in order to have a larger value of δ, the workers should attach a positive and sufficiently high value to the benefits (corresponding to a high φ). This can only be the case if the BSF achieves a proper level of efficiency and effectiveness. Efficiency implies that only a small portion of the tax revenues collected by the BSF is absorbed by the costs of administration of the programs (which implies a low K and a high δ). Effectiveness means that the delivered benefits actually match the demands of the workers and their families. Moreover, the quality of the benefits and services provided by the BSF must compare favorably with those offered by other agencies or the ones that can be purchased on the market.

The *third* conditions concern the autonomy of the BSFs from Government interference. The observation of real experiences of voluntary occupational welfare schemes in some European countries suggests that the relationships with the Government are a primary feature characterizing the social policies established by social partners. These relationships vary greatly according to the industry and national context. In particular, they are shaped by the long-established patterns of the industrial relations and the broad welfare system. On one extreme, BSFs may be completely autonomous, while, on the other extreme, they may be subject to bold Government interference up to the point of becoming tripartite rather than bipartite bodies.

What matters, in particular, is the degree of autonomy of the social partners from Government interference in making strategic decisions (Ebbinghaus, 2010a, 2010b; Ferrera & Maino, 2014). With full autonomy, in the "pure" model of bipartite policy, the union and employers' representatives sitting on the board of the institution can be regarded as the only decision-makers relative to the management of the tax-benefit policy. In particular, they make choices on the collection and allocation of financial resources, the provision of benefits, and the selection of recipients following the guidelines laid down by social partners in collective agreements.

At the same time, maintaining autonomy is easier when financing accrues to BSFs only by the contributions paid by affiliated employers and/or workers, while it tends to be weaker if the Government also pays in funds from the public budget.[7]

Finally, autonomy has to do with the selection of recipients of the benefits. If

[7]Indeed, financial contributions by the Government tend to go hand-in-hand with its involvement in the administration of funds (Manow, 2010).

BSFs are fully autonomous only workers and employers who contribute to the fund are selected as eligible. On the contrary, when Governments interfere in their policymaking, or assign public money to the funds, they put pressure to include also categories from outside this group. The redistributive bias of Government policies tends to reduce coefficient γ as it implies an enlargement of the audience of the beneficiaries beyond the boundaries of the social partners' constituency.[8]

The selection of recipients is relevant because redistribution hampers the equivalence between benefits and contributions by the workers. In the case of a tax-benefit program with a bold redistributive purpose, as it is usual for Government policies, equivalence between contributions and benefits arises whose value corresponds to the portion of the tax revenues financing the benefits targeted on groups of recipients that do not coincide with the group of taxpayers. In this case the workers would tend to resist the tax burden rather than accommodating it.

To sum up, on one hand the BSF may be close to its "pure" model, when it enjoys large autonomy from Government, does not receive resources from the public budget, and devotes most of its expenditure to its contributing members. On the other hand, it becomes "spurious"—more tripartite—when the Government interferes by limiting the decision-making power of the social partners, or by appointing its own representatives to the Board. This is more likely to occur when the social partners are weak in the industry, or the BSF is unable to collect sufficient financial resources and the Government supports it from public expenditure.

For the purposes of our analysis, we can note that only autonomous BSFs allow the equivalence between benefits and contributions by the workers since their main features contribute to strengthen the link between contributions and benefits. Conversely, this effect is prevented in the opposite case as Government interference, dependence on public resources and targeting outsiders weakens this link. Then, it must be concluded that the ability to compensate the benefits by the union and, consequently, the implications of the BSFs' tax-benefit policies for employment strictly depend on the exact institutional profile of the social policies established and managed by the social partners.

6. Concluding Remarks

In this paper, we have shown that a tax-benefit policy established by collective agreements and jointly managed by the social partners may have efficiency-enhancing implications in the labor market compared to a similar policy en-

[8]It is worth noting that this distinction tends to reflect the divide between insiders and outsiders as usually defined in labor market analyses. Indeed, those affiliated to or covered by BSFs are more likely to be insiders, namely employees with a permanent contract and a minimum amount of seniority in the formal sector and falling within industries and categories covered by powerful unions. Conversely, short-term employees, those employed in the smallest businesses, the unemployed and other workers with a weak attachment to the labor market and interrupted work histories are much less likely to receive benefits from a "pure" BSF.

forced by the government. Our main argument is that a tax-benefit policy managed through a BSF may favor a larger equivalence between benefits and contributions by the workers, making the union willing to share the cost of them by shifting part of the tax burden onto the wage. Consequently, the adverse impact on labor cost and employment is lessened. At the same time, cost sharing provides an economic rationale for the sharing of decision-making power as established by bipartite governance.

The paper has shown how the equivalence between benefits and contributions may arise as an outcome of a standard model of wage bargaining that includes the basic elements of a tax-benefit policy. This result adds a novelty in the economic literature, as according to it, the equivalence between benefits and contributions in a unionized labor market may occur only when very large unions bargain on wages at a nationwide level.

However, the degree of equivalence between benefits and contributions crucially depends on the institutional profile of the funds. It may actually occur if the exchange between wage and benefits is feasible in the context of current industrial relations, the workers attach a sufficiently high value to the benefits, and BSFs are autonomous from the government interference.

The consequences of the Covid-19 pandemic can reinforce the relevance of our results, if the emergency can contribute to increasing the level of appreciation of workers for the benefits obtained.

More broadly, the Covid-19 experience has shown that cooperation and collective agreements between workers and employers in the provision of welfare benefits may play a key role in strengthening the resilience of economic activities in possible future critical situations.

Overall, our results suggest that the welfare arrangements introduced through collective agreements may offer a remedy alternative to the mere cutting of social expenditure while lessening the major adverse impact of the Welfare State. Thus, they may play a role in providing benefits and topping up public welfare policies according to sectoral conditions.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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