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WORKERS' ENTERPRISES IN THE CASE OF ARTS PRODUCTION

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ABSTRACT - This paper shows that the standard result according to which labour-managed firms produce a lower amount of output, as compared to profit-maximising firms, is reversed if production per se gives utility and the workers' membership of labour-managed firms is set prior to market decisions. Under the same hypotheses, the labour-managed firms set a higher product quality than the profit-oriented ones, ceteris paribus. The considered hypotheses are particularly relevant for the case of the performing arts sector, so that the presence of labour-managed firms should be particularly welcomed in this sector. (JEL: L23, L82, Z10).

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ABSTRACT - This paper shows that the standard result according to which labour-managed firms produce a lower amount of output, as compared to profit-maximising firms, is reversed if production per se gives utility and the workers' membership of labour-managed firms is set prior to market decisions. Under the same hypotheses, the labour-managed firms set a higher product quality than the profit-oriented ones, ceteris paribus. The considered hypotheses are particularly relevant for the case of the performing arts sector, so that the presence of labour-managed firms should be particularly welcomed in this sector. (JEL: L23, L82, Z10).

WORKERS' ENTERPRISES IN THE CASE OF ARTS PRODUCTION

1. Introduction

It is well-known from the seminal contribution of Ward (1958) that labour-managed (LM) firms –i.e., firms that aim at maximising the per-worker surplus– produce, ceteris paribus, a lower amount of output as compared to profit-maximising (PM) firms. Moreover, LM firms react to exogenous shocks perversely, as compared to PM firms: notably, an increase of the output price, under perfect competition conditions, leads LM firms to restrict their optimal level of production; furthermore, an increase of fixed costs leads LM firms to increase the output level (Vanek, 1970). These results are obtained under the hypothesis that the labour input is a choice variable of firm.

In the present paper we simultaneously consider two different critical points made to the standard literature on LM firms.

Firstly, Sertel (1982, 1987) suggests that the distortions of the LM firms' behaviour are generated by the assumption that the size of membership is determined jointly with the output amount. According to Sertel, this assumption is far from being realistic: on the opposite, the membership of LM firm (i.e., the labour input) is set *before* the market decisions are taken. Under this hypothesis, LM firms are relabelled as workers' enterprises (WE). In such a case, the LM firm turn out to replicate the behaviour of the PM firm, and its alleged perverse behaviour, as compared to PM firm, indeed disappears. This happens irrespective of the intensity of market competition (see also Sertel, 1991, 1993, Fehr and Sertel, 1993).

Secondly, Cellini and Cuccia (2003) show that it is no longer true that LM firms necessarily produce a lower amount of output than the corresponding PM firms, if production *per se* provides utility. Under this hypothesis, it *can happen* that LM firms produce a larger amount of output than PM firms, at any given regime for the output market.

In the present paper, we consider the two aforementioned points together: specifically, we consider the case in which the labour input is not a choice variable for firms (that is, the labour input or the membership of LM firm is considered as given),

and the output production in itself provides utility. Under these hypotheses simultaneously considered, LM firms (better, WE firms) turn out to produce a larger amount of output as compared to the corresponding PM firms. This result holds under both perfect competition conditions and the monopoly case.

Under the mentioned hypotheses a clear-cut result emerges also with respect to the quality of production. The available literature provides mixed results concerning the quality choice of LM firms as compared to PM firms. For instance, Martin (1986) finds that product quality is higher in the LM firms, under the assumptions that quality and quantity are perfect substitutes, and total costs are linear in quantity. On the opposite, Lambertini (1997) finds that LM firms under-provide not only product quantity, but also product quality, as compared to PM firms, if the quality improvement requires increasing marginal efforts. Cellini and Cuccia (2003) find that the product quality can be higher or lower in LM firm relative to PM firm depending on the parameter configuration, if the output production *per se* provides utility. In the present paper we show that, under the *simultaneous* hypotheses that the membership of LM firm is given, and the production in itself provides utility, LM firms find it optimal to set a strictly higher quality of output, as compared to the corresponding PM firms, irrespective of the market competition regime.

We believe that the two considered hypotheses –i.e., the exogenous membership of LM firm and the love for production *per se*– are particularly appropriate in the case of arts production, and more specifically in the markets for performing arts. Hence, these markets represent examples in which the presence of LM firms should be particularly welcomed, since it means larger quantity and higher quality of output as compared to the choice made by PM firms. However, the assumptions can be also appropriate for other professional activities providing utility in itself.

The remainder of the paper is as follows. Section 2 briefly presents a few relevant points made by available models. Section 3 shows the core result of the paper concerning the amount of output production. Section 4 deals with the choice concerning product quality. Section 5 discusses the results and concludes, also taking in to account some preliminary evidence concerning the diffusion of cultural LM firms.

2. Literature

Consider the case in which production takes place according to the following production function, in which Q , L and K respectively denote the output, the labour input and the capital input:

$$(1) \qquad Q = Q(L,K) \quad , \qquad Q'_i > 0,\ Q''_i < 0,\ i = L,K$$

and let p, w and r be the price of Q, L and K, respectively.

Under perfect competition conditions, the PM firm aims at maximising the following objective function

$$(2) \qquad \pi = p \cdot Q(L,K) - wL - rK\ .$$

while the LM firm aims at maximising the surplus per worker, that is, what remains for each worker, after the K input is paid;[1] formally, the LM firm maximises the following function:

$$(3) \qquad y = \frac{pQ(L,K) - rK}{L}$$

If K is fixed ($K = \overline{K}$), so that a fixed cost is entailed, $F = r\overline{K}$, and L is the choice variable, it is easy to show that the LM firm produces a lower amount of output as compared to the corresponding PM firm (provided that the profit of the PM firm is positive).[2] Moreover, the LM firm reacts to an exogenous increase of fixed costs, by

[1] Notice that the labour input coincides with the membership of the LM firm, and each worker offers a constant amount of labour. Models that remove these assumptions are, e.g., Ireland and Law (1982) or Bonin and Putterman (1987).

[2] The result derives from the first order condition (FOC) with respect to L, computed on objective functions (2) and (3). The FOCs lead to $Q'_L = w/p$ and $Q'_L = (pQ-F)/(Lp)$, for PM firm and LM firm, respectively. Since $[(pQ-F)/L] > w$ (provided that profit of PM firm is positive), and provided that Q'_L is decreasing in L, the optimal amount of labour employed by the PM firm

increasing the level of production (differently from the PM firm, which maintains the level of production constant) and reacts to an exogenous increase of the output price, by decreasing its optimal level of production (differently form the PM firm which finds it optimal to increase its level of production).[3]

The intuition is straightforward: LM firms are interested in per-worker surplus and find it convenient to restrict their labour input (i.e., their worker membership), and hence their production level, as compared to corresponding capitalistic firms. Moreover, LM firms react to adverse shocks (e.g., an increase of fixed costs or a decrease of output price) by enlarging the membership and hence the production.

Analogous considerations hold if a firm sells its product in monopoly or oligopoly markets. If, for instance, the output market is a monopoly, the price of output is no longer the parameter *p*, but it is given by the function

(4) $$P=P(Q), \qquad P'_Q \equiv dP(q)/dQ < 0 .$$

In such a case, under the hypothesis that the input labour is the choice variable (with a given amount of capital input), the comparison of optimality conditions for the PM firm and the LM firm easily leads to the conclusions that the amount of labour input for the PM firm is larger than the optimal level for the LM firm.[4]

As already mentioned, Sertel (1982, 1987) argues that it is unrealistic to believe that the amount of labour, and especially the membership of a LM firm, is endogenous: as a matter of fact it is pre-determined, since significant membership constraints to entry and exit are indeed operative in the real world, and "markets for memberships" do not

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(and hence its level of production) is larger than the optimal level for the LM firm (see Ward, 1958; Vanek, 1970).

[3] These results immediately derive from the application of the implicit function theorem to the FOCs.

[4] First order conditions for the PM firm and the LM firm in monopoly are respectively, $Q'_L(.) = (w/p)/(1+1/\varepsilon_{Q,P})$ and $Q'_L(.) = \{[(pQ(.)-F)/L]/p\}/(1+1/\varepsilon_{Q,P})$, where $\varepsilon_{Q,P}$ denotes the price elasticity of the market demand. See Hill and Waterson (1983), Cremer and Cremer (1982) among others for the analysis of LM firms in oligopoly markets.

exist. In other words, Sertel questions the assumption that the labour input can be endogenously determined with the production levels by part of firms, and he considers instead the case in which the labour input is predetermined, so that the choice variable is the level of capital. Sertel labels the labour-managed firms facing exogenous membership as workers' enterprises (WE). Under this circumstance, he finds that the optimal behaviour of the WE coincides with the optimal behaviour of the profit-maximising firm.

To prove the result obtained by Sertel is sufficient to consider equations (2)-(3), imposing $L = \overline{L}$ (with $\overline{L} > 1$ as a constant parameter), and to solve the optimisation problems with respect to *K*. Under both the case of PM firm, and the case of WE, the optimal choice is such that $Q'_K = r/p$. Thus, PM firms and WE firms are identical as concerns the optimal choice, and hence as concerns the reaction to exogenous shocks. Also this result holds irrespective of the competition regime in the output market.[5]

In conclusion, when the choice variable of firm is no longer the labour input, but inputs other than labour, LM firms behave in the same way as PM firms, and their "perverse" behaviour disappears.

A (different) well-known theoretical result, originally suggested by Meade (1972), is that an economy populated by LM firms would replicate the Walrasian allocation of an economy populated by PM firms, if a proper market for LM membership existed (see Dow, 1996, for an analytical proof). However, there is a wide body of economic (and sociological) literature on labour-managed firms showing that the entry to (as well as the exit from) the membership of a LM firm is difficult indeed (Dow, 1986; Moretto and Rossini, 2003; Caves, 2000, Chs 14 and 15 with specific reference to the performing arts sector). This means that the LM membership in the short-run is at least a sticky (if not fixed) variable, and the point made by Sertel has a clear relevance. Moreover, we guess that a market for membership in LM firms could be particularly useless for the performing arts, since the aggregation among artist-workers in firms can hardly be determined by market mechanisms in this peculiar sector.

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[5] If, for instance, the output market is a monopoly, under the demand function (4), the profit is: $\pi = P(Q(K,\overline{L})) \cdot Q(K,\overline{L}) - w\overline{L} - rK$, while the surplus per-worker is $y = [P(Q(K,\overline{L})) \cdot Q(K,\overline{L}) - rK] / \overline{L}$, and the corresponding FOCs (w.r.t. *K*) coincide.

The standard results on the perverse behaviour of LM firms are questioned not only when one assumes that the workers' membership is exogenous, but also under different circumstances.

For instance, maintaining the assumption that labour is the choice variable for firms (that is, the membership of LM firm is endogenous), Cellini and Cuccia (2003) analyse the case in which the production *per se* provides satisfaction (or utility). The arts represent a notable case in which the good production in itself provides utility, as suggested by Throsby (1994,a,b), among many others. However, it can be easily accepted that some other groups of persons –like experimental scientists, researchers and academics, doctors, lawyers, and so on– derive satisfaction from their work in itself and not just from the monetary income derived.[6] Moreover, the same point also applies to the managers that face production incentives, i.e., to the managerial firms which have the production level in itself among the objective function to be maximised.[7]

Let $v=v(Q)$ denote the monetary measure of utility provided by the production *per se* of good Q, with $v'_Q \equiv dv(Q)/dQ > 0$. Under such an hypothesis, a PM firm maximises a function like $\pi^{aa} = \pi^{aa}(\pi, v(Q))$ while a LM firm maximises a function like $y^{aa} = y^{aa}(y, v(Q))$ where superscript *aa* denotes "love for production" (or love for arts, in the specific case of arts production). For the sake of ease, let assume additive separable objective functions, so that PM and LM firm respectively maximise:

$$\pi^{aa} = p \cdot Q(L,K) - wL - rK + \alpha v(Q(L,K)) \tag{5}$$

$$y^{aa} = \frac{pQ(L,K) - rK}{L} + \beta v(Q(L,K)) \tag{6}$$

[6] See, e.g., Glazer (2004), and Francois (2000, 2003) for a specific analysis on public services.

[7] Classical references are Baumol (1959) or Williamson (1964); however, see in particular Vickers (1985), who suggests to consider the objective function of a managerial firm as a weighted average of profit and production.

where $\alpha \geq 0$ and $\beta \geq 0$ are preference parameters capturing the importance of the production *per se* into the objective functions.

If α and β are strictly positive, it is no longer necessarily true that a LM firm produces a lower level of production as compared to the corresponding PM firm. The proof is immediate. From the FOCs w.r.t. L computed on the objective functions (5) and (6) with $K = \overline{K} > 0$ and hence $F = r\overline{K} > 0$, one respectively obtains:

$$Q'_L(.) = \frac{w}{p + \alpha v'_Q} \tag{7}$$

$$Q'_L(.) = \frac{pQ(.) - F}{L} \cdot \frac{1}{p + \beta L v'_Q} \tag{8}$$

Comparing (7) with (8), one immediately realises that the LM firm may produce either a larger or a smaller amount of output as compared to the PM firm, depending on parameters α and β and the sign of the second derivative of $v(Q)$.[8] Note that it is not sufficient that the utility from production *per se* exists, in order to conclude that LM firm produces a larger output than the PM firm: this is simply a possibility, depending on the parameter configuration.

The following implications are immediate: under the case that production *per se* provides utility, it is no longer necessarily true that a LM firm reacts to an increase in fixed costs by increasing the level of production (like it happens in the case of a standard LM firm). Moreover, it is no longer necessarily true that a LM firm (with utility from production *per se*) reacts to an increase of the output price by decreasing the level of output.[9] In particular, the "perverse" reaction of LM firm to exogenous shocks depends on specific parameter conditions.

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[8] For instance, if $v''_Q=0$ and $v'_Q=v>0$, the LM firm produces a larger amount of output than the PM firm if $w/(p+\alpha v) > [pQ(.) - F]/[L(p+\beta L v)]$.

[9] The corollaries can be easily proved by applying the implicit function theorem to condition (7); see Cellini and Cuccia (2003, pp. 46-49) for the details.

It is clear that the point made by Sertel and the point made by Cellini and Cuccia are not mutually exclusive. It is well possible that the labour input of a firm is given (i.e., the membership of a LM firm is predetermined, so that we are considering a WE properly speaking), *and* production *per se* gives utility. This case is considered in next Sections.

3. Workers' enterprises with love for production

Consider a firm facing a constraint on the amount of labour input to be used for production (along the lines suggested by Sertel, 1987), under the case in which the *per se* production of output provides utility (along the lines suggested by Cellini and Cuccia, 2003).

This means that –under perfect competition conditions– the PM firm maximises the following objective function:

$$\pi^{aa} = p \cdot Q(\overline{L}, K) - w\overline{L} - rK + \alpha v(Q(\overline{L}, K)), \quad \alpha \geq 0 \tag{9}$$

while the corresponding WE maximises the function:

$$y^{aa} = \frac{pQ(\overline{L}, K) - rK}{\overline{L}} + \beta v(Q(\overline{L}, K)), \quad \beta \geq 0 \tag{10}$$

As already mentioned, these assumptions are particularly appropriate in the case of the production of arts goods, and in the case of performing arts more specifically: a wide body of available theoretical models suggest that the production *per se* of such goods provides utility: see, e.g., Throsby (1994a,b), Frey (1997), Caserta and Cuccia (2001), Papandrea and Albon (2004), and particularly Caves (2000), who interprets the love of suppliers for their productions as the most remarkable feature of arts sector. Moreover, the membership entry-exit processes are quite difficult in this field, as documented by Caves (2000, Chs. 14 and 15): he argues that the limited possibility of entering and exiting the LM membership, that is, the lack of a proper market for the

memberships, is one of the reasons why labour-managed firms experienced serious difficulties in the field of performing arts, as widely documented by the case study of American orchestras.

Maximisation of function (9) regarding PM firm implies

$$Q'_K(\overline{L},K) = \frac{r}{p + \alpha v'_Q} \tag{11}$$

while maximisation of function (10) regarding WE implies

$$Q'_K(\overline{L},K) = \frac{r}{p + \overline{L}\beta v'_Q} \tag{12}$$

The conclusion about the comparison between the optimal choices of PM and WE firms depends on the relationship between α and $\overline{L}\beta$. It appears to be natural to assume:

$$\alpha < \overline{L}\beta \tag{13}$$

Under this assumption, [10] the optimal level of capital input used by the WE firm turns out to be larger than the optimal level of capital used by the PM firm.[11] Consequently, the level of production is larger for WE, as compared to PM firm.

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[10] Condition (13) appears to be natural provided that the love for arts by part of workers involved in their production is presumably larger that the love for arts of a profit-oriented capitalist ($\alpha < \beta$). In any case, even if the love for arts were the same ($\alpha = \beta$), condition (13) is fulfilled as long as $\overline{L} > 1$. It is clear that when $\overline{L} = 1$ and $\alpha = \beta$, the choice made by the PM firm and the WE coincide: in fact, the profit or the individual surplus for the one-person firm coincide. Note that a scale effect is present in the problem of the LM firm, since the function *v*(.) conceptually denotes the utility derived by one worker; in the objective of the PM firm, *v*(.) is conceptually referred to the profit-maximising agent. Of course, the scale effect would disappear

This conclusion holds also in the case of monopoly in the output market. In such a case, the market demand function (4) has to be considered instead of parameter *p*, in the objective functions (9) and (10). The corresponding FOC for a monopolistic PM firm results to be

$$(14) \qquad (P'_Q \cdot Q + P + \alpha v'_Q) Q'_K (\overline{L}, K) = r$$

while the FOC for the monopolistic WE is

$$(15) \qquad (P'_Q \cdot Q + P + \overline{L}\beta v'_Q) Q'_K (\overline{L}, K) = r$$

Also in this case, maintaining condition (13), we immediately can conclude that the WE produces a larger amount of output than the PM firm.[12] Clearly, in the case of a monopolistic output market, the presence of WE firms is thus able to reduce the dead-weight loss associated to PM firm.

4. The choice on product quality

The available literature on the choice of PM firm concerning product quality is, to the best of our knowledge, rather limited, and provides mixed results. Taking a sociological

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if either *v*(.) were multiplied by *L* in the objective of the PM firm, or divided by *L* in the PM problem.

[11] If $\alpha < \overline{L}\beta$, then $r/(p + \alpha v'_Q) > r/(p + \beta \overline{L} v'_Q)$ and hence the marginal productivity of capital input has to be equal to a larger amount in the case of a PM firm, as compared to the corresponding WE firm. This requires a smaller amount of optimal capital input for the PM firm, given the decreasing marginal productivity hypothesis.

[12] The Proof is straightforward: WE has to equate Q'_K to $r/(P'_Q \cdot Q + P + \overline{L}\beta v'_Q)$, which is smaller than $r/(P'_Q \cdot Q + P + \alpha v'_Q)$ for any given level of *K*. Provided that Q'_K is decreasing in *K*, the conclusion follows.

perspective, some Authors argue that the structure of LM firm leads to higher quality effort per member, which translates into higher product quality; along these lines, the differences in output quality across different types of firms are rooted in the differences in worker motivation, and the evidence supporting the argument are generally heuristic or anectotical (see various contributions in Stephen, 1982). Martin (1986) proposes a model under the assumption that worker motivation is the same across different types of firms, and finds that LM firms choose higher product quality than PM firms, provided that quantity and quality are perfect substitutes in the service flow derived by consumers from the considered product, and production costs are linear in quantity. On the opposite, Lambertini (1997) finds that the (standard) LM firms not only produce a smaller amount of output quantity, as compared to PM firms, but also set a lower product quality, if the quality of product is a choice variable entailing increasing marginal cost;[13] this result, however is no longer clear-cut if one considers non-standard distributions of consumers over the interval for quality premium (Celada and Lambertini, 2004). The output quality of LM firm relative to PM firm turns out to be ambiguous also the case in which production *per se* provides satisfaction and the labour input is a choice variable for firm (Cellini and Cuccia, 2003).

In this Section we show that a clear-cut result obtains, if one simultaneously assume that (i) production *per se* provides utility, and (ii) the labour input is set prior to output decisions. Under these assumption, the output quality set by a LM firm is higher as compared to a PM firm, ceteris paribus.

We omit to discuss the problem concerning the possibility of objectively observing the quality of a good, even if this point is particularly important in the case of arts production – see, e.g., Towse (1997).

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[13] This strand of literature generally consider (standard) industrial-organization models with vertically differentiated goods (like Spence, 1975 or Mussa and Rosen, 1978) and substitutes the hypothesis of profit maximization with the assumption of per-worker surplus maximization. See also Celada and Lambertini (2004), who consider non standard distribution of consumers, so obtaining that it is not necessarily true that LM firm choose lower quality as compared to PM firms; and Martin (1986), who considers constant cost for improving quality, so obtaining that the quality of product by LM firms can be higher as compared to PM firms.

Following a suggestion by Hansman (1981) we simply assume that a firm can decide the number of units of sold output, n, and their quality q, which is assumed to be observable. Moreover, the unit price of output is given by the following inverse market demand function:

(16) $$P = P(n,q) \quad , \quad P'_n = \partial P / \partial n < 0 \, , \, P'_q = \partial P / \partial q > 0$$

The production of output units and output quality can be represented through the following production functions:

(17) $$n = n(L,K) \quad , \quad n'_L = \partial n / \partial L > 0 \, , \, n'_K = \partial n / \partial K > 0$$

(18) $$q = q(I) = I$$

where I denotes effort for quality, that entails quadratic cost, i.e.,

(19) $$c(I) = b \cdot I^2 \quad , \quad b > 0$$

Within this framework, a PM firm with love for production in itself maximises the objective function

(20) $$\pi^{aa} = P(n(L,K),q) \cdot n(L,K) - wL - rK - bI^2 + \alpha v(n(L,K),q)$$

while LM firm maximises

(21) $$y^{aa} = \frac{P(n(L,K),q) \cdot n(L,K) - rK - bI^2}{L} + \beta v(n(L,K),q)$$

Let us start by considering the (standard) case that both L and I are choice variables, while K is given (see Cellini and Cuccia, 2003). The optimum for PM and LM firms respectively implies:

(22) $$n'_L = \frac{w/P}{1+\varepsilon_{P,n}+(\alpha v'_n/P)} \quad , \quad I = \frac{P'_q \cdot n + \alpha v'_q}{2b}$$

(23) $$n'_L = \frac{[(Pn - bI^2 - r\overline{K})/L]/P}{1+\varepsilon_{P,n}+(\beta L v'_n/P)} \quad , \quad I = \frac{P'_q \cdot n + \beta L v'_q}{2b}$$

where $\varepsilon_{P,n}$ denotes the price elasticity to the number of output unities**.**

Comparing (22) and (23), it is immediately clear that:

a) if production *per se* does not provide utility i.e., $\alpha = \beta = 0$ (so that we fall in the "standard" model of LM firm with endogenous choice of labour input), the number of output unities sold by a PM firm is larger than the optimal number for the corresponding LM firm, provided that the profit of the PM firm is positive, i.e. $(Pn - bI^2 - r\overline{K})/L > w$. In symbols, $n^{PM} > n^{LM}$. In turn, the optimal efforts in product quality, and the product quality itself, are larger for the PM firm as compared to LM firm, given that $P'_q n^{PM}/(2b) > P'_q n^{LM}/(2b)$.

b) if production *per se* provides utility, it is no longer necessarily true that PM firm set larger n and I than LM firm, and the relationship between n^{PM} and n^{LM}, as well as the relationship between their respective efforts in product quality, become ambiguous a priori.

However, if we consider the case that the labour input is set before the market decisions are taken, so that L becomes a constant, while the choice variables are K and I, the optimum conditions for PM and LM firm respectively are:

(24) $$n'_K = \frac{r}{P'_n n + P + \alpha v'_n} \quad , \quad I = \frac{P'_q \cdot n + \alpha v'_q}{2b}$$

(25) $$n'_K = \frac{r}{P'_n n + P + \beta L v'_n} \quad , \quad I = \frac{P'_q \cdot n + \beta L v'_q}{2b}$$

Comparing (24) and (25) it is immediate to verify that:

a) if production *per se* does not provide utility, i.e., $\alpha = \beta = 0$ (so that we fall in the model of WE firm *à la* Sertel), the WE and the PM firm choose the same optimal amount of capital, and hence produce the same quantity of output. Also the efforts for quality, and product quality itself, are the same for both types of firms.
b) if production *per se* provides utility, and condition (13) holds, the marginal productivity of capital at equilibrium has to be larger for the PM firm as compared to the WE. As a consequence, the optimal amount of capital for the PM firm is smaller than the optimal amount of capital for the WE; hence, the amount of production optimal for the PM firm is smaller as compared to the optimal amount for the WE. As far as concerns the efforts for product quality, it is immediate to see that the optimal efforts for a PM are smaller than the optimal efforts for a WE, thanks to (13), and hence the product quality chosen by a WE firm is higher than the quality chosen by the corresponding PM firm, ceteris paribus.

In sum, LM firms find it optimal to produce a larger amount of output, and to set a higher quality of output, as compared to PM firms, if they face a pre-market constraint on their labour membership, and the *per se* production of good provides utility. The economic explanation is simple: under the considered circumstances, the marginal benefits from increasing quantity and quality of output are larger for labour-managed firms, as compared to profit-maximising firms, while the marginal costs are the same for both types of firms. In particular, the larger amount of output chosen by WE is explained by the higher satisfaction from production in itself, joint with the fact that it is impossible to reduce the number of members who share in the benefits, since the workers' membership is assumed to be given.

5. Discussion and concluding remarks

In this paper we have shown that the standard result that labour-managed firms find it optimal to produce a smaller amount of output as compared to profit-maximising firms

is reversed, when production *per se* gives utility and the size of workers' membership is set before the market decisions are taken. Under the same assumptions, a clear-cut result emerges, concerning the output quality: labour-managed firms find it optimal to set a higher product quality, as compared to profit-maximising firms.

The two mentioned hypotheses are particular appropriate for the performing arts sector. Here, (i) the *per se* production of output provides satisfaction; (ii) the amount of labour to be used for production is hardly interpretable as a *choice* variable, both because labour is hardly substitutable with other inputs, and because the specific qualification of workers makes it difficult (if not impossible) the existence of a market for the LM firm membership. Hence, we have argued that in the arts' sector the presence of workers' enterprise has to be particularly welcomed, since their presence does not entail the market inefficiencies usually associated to labour-managed firm in standard industrial sectors.

Perhaps, it is not a case that the presence of LM firms is more intense in cultural sector as compared to other sectors. Even if statistical data are difficult to collect (and to compare across countries, especially because of difference in registration and classification of firms) some piece of evidence can be mentioned. In Italy, for instance, cooperative firms (the legal form of firms nearest to LM) represent 1,4% of registered firms, but in the class of "various services" (in which cultural firms enter), the percentage goes up to 5.6% (a datum below only to the percentage in the class of "education and health").[14] In our region (Sicily), where we have checked the individual registration of firms into the formal Register "Registro delle imprese", cooperatives are 2,4% of all firms, but the percentage is around 9% if we focus on firms operating in cultural fields. Different Italian Regions (like Emilia Romagna in the North) share similar data.[15]

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[14] Data are from Unioncamere (2004) and are referred to June 2004.

[15] A comprehensive research on the diffusion of cultural LM firms is in our research agenda. Update data on diffusion of cooperative firms are available in many websites; see, e.g., the site of the University of Wisconsin Centre for Cooperatives with its links, or the site of the Committee for the Promotion and Advancement of Cooperative by COPAC (a project joining UN, ILO, FAO among other institutions).

However, the love for production in itself occurs also in different sectors (education and health notably) and in different cases, like for instance in several professional activities, or when a managerial incentive is present. Furthermore, constraints to labour input are present is many cases, and the absence of a proper market for the participation in the membership of labour-managed firms is the rule rather than the exception. Thus, our conclusion that LM firm produce a larger amount of output, and set a higher product quality, than the corresponding profit-maximising firms is likely to extend well beyond the arts sector.

A cautionary notice has to close the paper: our present model is very simple and it has not taken into consideration additional elements worthy analysing; just to mention the most important: the distortions in the individual incentives for workers (Kremer, 1997); the distortion in investment in productive capacity (Futagami and Okamura, 1996; Lambertini and Rossini, 1998) or in R&D for process innovation (Lambertini, 1998); different objectives chosen by the LM firm (see Oczkowski, 2006); the determination of the initial size of firm. Such elements are for sure interesting research topics.

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