

An economic evaluation of “interprofessional” Funds as training policies

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1. Introduction

The European strategy establishes that by the year 2010 the average rate of participation to lifelong learning in the EU should be at least 12,5% of the active adult population. Along with education, continuous training is a central element of such a strategy in view of the major objectives of economic competitiveness and workers' employability. In this regard, Italy shows a strong deficit and until recently lacked policies directed at promoting continuous training. Such policies have only emerged in the early nineties. In a first phase, financial instruments have been introduced to sustain training sponsored by firms and an individual right to undergo training has been settled. At the same time, social parties recognized the strategic role of this matter and began to deal with it in collective agreements. More recently, as a result of the push deriving from the initiative of the policy-maker and thanks to the interest of the social parties, a second phase has been launched, characterized by the establishment of “interprofessional” Funds. Today these represent the core around which a system can be structured for the development of continuous training in Italy.

There are two fundamental elements that characterize the Funds. Firstly, a financial channel which is able to collect huge resources is provided for and, secondly, the centrality and the autonomy of the social parties in such a system are acknowledged. In connection with this double characteristic of the Funds this paper develops two theses. The first one is that the financial channel does not simply act as a mean to collect and allocate resources, but contains within it an incentive mechanism whose effectiveness needs to be evaluated. The second thesis is that the major role of the social parties within the new institutional system of

continuous training has implications that also extend to other areas of their contractual activity and must be considered in order not to jeopardize the effectiveness of training policy.

With the establishment of the Funds, the development of continuous training policies in Italy will link up with the broader policies of social pacts. About two decades from the first experiences, a social pact involving workers' and employers' representatives can no longer be conceived only in terms of an exchange between wage moderation and employment. The urgency of the objectives of competitiveness and growth, on one side, and the contrast of the effects of precariousness of employment, on the other side, demands the adoption of articulated policies and shared investments in human capital, in the context of broader development strategies.

The second section presents some evidence on continuous training in Italy and describes the "interprofessional" Funds. The third section draws a theoretical scheme of evaluation of training policies effectiveness in connection with the structural characteristics of the markets. The fourth section develops a model of analysis of the enterprises' choices relative to training under the hypothesis of an imperfect labour market and in the presence of different policies and of collective wage bargaining. The principal implications for the Funds and for the role of the social parties are derived in section 5. The last section synthesizes the conclusions.

2. Continuous training in Italy and the "interprofessional" Funds

The article 118 of law n.388/2000 (legge finanziaria 2001) and the subsequent article 48 of the financial law n.289/2002 (legge finanziaria 2003) accomplishing an initial forecast contained in law 196 of 1997, have introduced "interprofessional" Funds for continuous training. These will progressively absorb the resources derived from compulsory contribution, which amounts to 0,30% of the payroll costs, paid up-to now by the firms to the INPS, and devoted to the financing of workers' training¹. Their constitution comes from an agreement between the social parties, while supervision function is assigned to the Ministry of Labour. It is foreseen that the Funds not only assume an articulation by sector but also a territorial one to consent the necessary link with regional planning (Ministry of Labour 2002). The financial mechanism, so long as it is based on compulsory contribution, requests the will of the single firm to join one of the constituted Funds.

The set of rules provides for that the adhesion to the Fund can be revoked, is optional and its validity lasts a year. Otherwise, the firm is allowed to pay the contribution in favour of the INPS; the adhesion can also be addressed to a Fund of a different sector from that to which the firm belongs. This possibility of choice will be more significant when there will be a large number of Funds to exercise it. The Funds finance individual, company, industrial and territorial plans through subsidies and can invest part of the resources to provide

¹ This contribution has been utilized up to now to finance the European Social Fund and for the interventions forecasted by the law 236/93. It represents an additional quota of the contribution that the enterprises pay to the INPS for the compulsory insurance against involuntary unemployment, which is generally equal to 1,61% of the total wages (see Ministry of Work 2002). The resources destined to the Funds have increased in accordance with the law as from 1999 to reach 50% of the third part of the revenue deriving from the contribution of 0,30% of the total wages.

complementary services of a promotional, informative or organizational nature. The year 2001 saw the end of the transitory phase. The first firms' enrolments were registered in 2003 and by the year 2004 the Funds were initiated. Every year the firms should convey their own adhesion or cancellation to the INPS, and the same Institution will provide to transfer the financial resources to the Funds. To the 185 million euros, which the Ministry of Labour has already allocated, should be added the resources directly originating from the firms' enrolments, the total potential value of which is estimated to be 510 million euros per year (Bulgarelli 2004).

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Certainly, before the introduction of the Funds Italy was not in the year zero as far as the policy for the continuous training is concerned thanks to the instruments and the experimentations conducted in the past fifteen years. Despite this, training still represents a marginal element in the strategies of the firms and of the social partners. The main task of the Funds, therefore, is to promote, not simply to manage, workers' training. All researches show that the training volume sponsored by the Italian firms is below the average European level. The percentage of the training firms, according to CVTS, in the year 1999 was just 24% (Fig.1) and decreases to 16% with reference to the small enterprises, a value just equal to one third of the corresponding value of Europe with 15 countries. Equally scarce appears to be the volume of training achieved in Italy in terms of percentage of workers involved, i.e., 26% against the European 40% (Fig.2).

HERE FIG. 1 AND 2

Another stylized fact that emerges from the information at hand is the uneven distribution of the entry opportunities to training among workers with different characteristics. Training is selectively addressed with preference to managers and office workers, of male gender, under 54 years of age, with at-least a high school level of education (Tab.3). In the services sector, excluding that pertaining to commerce, there is more availability of training opportunities. Finally, in the larger firms (with 250 employees or over) the percentage of trained workers is double compared to that of smaller firms (with less than 50 employees).

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3. Market failures and training policy options

The economic analysis distinguishes two fundamental cases of malfunctions of the markets due to which an inefficient amount of resources is invested in training, with regards to general or, at least, not strictly specific training (Stevens 1999). The first case is that in which the labour market operates in a perfectly competitive manner, the wages are equal to labour productivity and the benefits of training stimulate workers to entirely sustain the cost of their own training. However, difficulties emerge if credit market is imperfect and

a liquidity constraint prevents workers from paying for training. It follows that, at least a part of their investment cannot be achieved, nor can it be achieved by the firms under such conditions of labour markets.

In this case, a public intervention can make it possible for such an investment to take place by replacing the missing credit up to a level retained to be socially optimal. The first obvious possibility consists in a public loan to the workers on more favourable grounds than those offered to them by the market. The same result can be obtained with a training subsidy financed by a tax levied on the wage of the qualified workers. As in the case of the loan, the subsidy would make it possible to have a larger amount of income available during the training period, thereby allowing the worker to sustain the cost in exchange for a reduction (within the limit of the tax) of the net income that he will gain after the training period.

In the second case, instead, it is assumed that there is an imperfection in the operation of labour market due to which the wage after the training period remains below productivity. Therefore the benefits deriving from training to the workers are lower, and consequently their availability to spend on it is lesser. On the other hand, the firms gain a margin of profit equal to the difference between the productivity and the wage paid to the skilled worker. The problem, however, is that a part of this profit is captured by those firms which are able to employ skilled workers without having sustained the costs (see Croce 2004). In the presence of such a positive externality, public intervention can impose upon firms the realization of a certain amount of training. This way, all firms are forced to charge themselves a part of the costs and the desired quantity of qualified workers will inflow in the labour market. An alternative intervention consists of a training subsidy financed by a tax on the profit of the firms. As a consequence of this, firms are compelled to provide the socially desirable level of training. From a theoretical point of view, therefore, each public intervention is effective under certain conditions, whereas it is totally or almost totally ineffective beyond such conditions (Tab.4).

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The model shown in the following section considers a labour market in a condition of imperfect competition, on the basis of the available evidence – indicated in the section 5 – which confirms the absence of perfect competition in the labour markets, and at the same time, the existence of considerable mobility of skilled labour in Italy.

4. Private investments, training policies and bargaining in an imperfect labour market

4.1. Assumptions

The model presented here develops previous works by Stevens (1996, 1999), Booth and Chatterji (1998) and Booth, Francesconi and Zoega (1999, 2002) and it is in line with non-competitive theories of workplace training which predict that training investments are shared by workers and firms and the proportion of them sponsored by each part varies depending on several assumptions (see also Acemoglu and Pischke, 1998, 1999).

Unlike Stevens (1996) in this model workers don't pay a price to the firms for training they receive but, more realistically, accept a reduction in their wage during training period.

The model lasts two periods (we omit time discount for sake of simplicity). The economy is composed of two sectors: a primary sector comprising two firms which train their employees and, after, employ them as skilled workers, having the 'high' level of productivity n_2 ; a secondary sector with a large number of firms competing in a perfectly competitive labour market. Labour productivity in secondary firms is fixed at the 'low' level n_1 and no training is supplied by them. Unlike Stevens (1996), in the primary sector not only training but also production occurs in the first period. Newly hired workers are trained during working-time. Training is general (transferable) as skills are valued the same by both firms in the primary sector. At the beginning of the second period trained workers enter the skilled labour market and firms compete each other to attract them. Competition for skilled labour in the primary sector is represented as in Stevens (1996). We assume that for reasons as heterogeneous mobility costs or workers' preferences, skilled workers are not perfectly sensitive to wage differential between the two firms (Bhaskar et al. 2002). Because of this imperfect sensitivity there is some stickiness in workers' mobility, so that even if a firm pays a wage a little below the other, it is able to retain some workers.

We also assume, for simplicity, constant scale of returns to (both skilled and unskilled) labour. Wage in the secondary sector is constant over time and equal to productivity of unskilled labour n_1 . Instead, productivity in the primary sector is $n_1 - d$ in the first period, where d (with $d < n_1$) represents the output loss proportional to the given quantity of working-time – assumed to be exogenous – devoted to training, while in the second period it is $n_2 > n_1$. Both firms face an identical training cost function $C(N_h)$, where $h = i, j$ and $C'(N_h) > 0$, $C''(N_h) > 0$, $C(0) = 0$. N_i and N_j represent the number of workers hired and trained, respectively, by the firm i and j , whereas $N = N_i + N_j$ is their total number in the sector.

		Period 1	Period 2
Secondary sector	Productivity	n_1	n_1
	Wage	n_1	n_1
Primary sector	Productivity	$n_1 - d$	n_2
	Wage	W_{1i}, W_{1j}	W_{2i}, W_{2j}

Workers are risk-neutral and homogeneous (before training). The number of unskilled workers employed in the secondary sector is very large at the perfectly competitive two-period income $2n_1$. Then at the beginning of period 1 labour supply (of potential trainees) in the primary sector is infinitely elastic at a two-period income $2n_1$. Every worker prefers to be employed in the primary sector if he can earn at least the same total remuneration at disposal in the secondary sector.

The degree of stickiness in the workers' mobility is measured by the function $F(w_{2i} - w_{2j})$ which gives the probability that a trained worker chooses to be employed in firm i , when w_{2i} and w_{2j} are the wages

announced by the firms at the beginning of period 2. This function is assumed to have the following properties (given $w_{2i}, w_{2j} \geq n_1$) (see Stevens 1996 and Booth, Francesconi and Zoega 2002):

$$\begin{aligned} F(w_{2i} - w_{2j}) &= 1 - F(w_{2j} - w_{2i}); \quad F(0) = \frac{1}{2}; \\ F'(\cdot) &> 0; \quad F''(\cdot) \leq 0 \quad \text{with} \quad (w_{2i} - w_{2j}) > 0; \\ F(w_{2i} - w_{2j}) &\rightarrow 1 \quad \text{as} \quad (w_{2i} - w_{2j}) \rightarrow \bar{x} \quad \text{where} \quad \bar{x} \in (0, \infty) \end{aligned}$$

We also assume that neither firms nor worker know at the beginning of period 1 which preferences he will have in period 2. This implies that firms cannot act as a discriminating monopsonist but pay all workers the same wage. They only know that, given wages w_{2i}, w_{2j} , they will choose firm i with probability $F(\cdot)$ and firm j with probability $1 - F(\cdot)$. Then, the expected wage of a trained worker is $E(w_2) = w_{2i}F(\cdot) + w_{2j}[1 - F(\cdot)]$ and the participation constraint to the primary sector is $w_1 + E(w_2) \geq 2n_1$. However, notice that, as shown in next sections, in the symmetric setting of this model firms choose an homogeneous wage ($w_{2i} = w_{2j} = w_2$) and the expected wage is reduced to w_2 .

4.2. Training in an imperfect labour market

The model has to be solved by backward induction, so we first consider the firm's choice of the wage of the second period, then we go on to training decisions made in the first period. Firm i chooses the second period wage in order to maximise its profits

$$p_{2i} = (n_2 - w_{2i})F(w_{2i} - w_{2j})(N_i + N_j).$$

The first order condition is therefore

$$(n_2 - w_{2i}^*)F'N = FN$$

from which the optimal wage for the firm, w_{2i}^* , can be derived. At this level of wage, the benefits and the costs of an infinitesimal wage rise are equalised at the margin. In the condition above the left-hand term measures the marginal benefit of a wage rise, given by the increase in the number of trained workers employed by firm i times the surplus $(n_2 - w_{2i}^*)$ that it captures on each one of them; the right-hand term, instead, measures the increase in the payroll costs which is proportional to the total amount of employment in the firm. The following optimal wage can be derived

$$w_{2i}^* = n_2 - \frac{F}{F'} \equiv n_2 - k$$

where $k \equiv F/F'$. The parameter k represents the firm's surplus and can be considered as a measure of the degree of monopsony power of the firm. Its value is inversely related to the workers' sensitivity to the wage differential and tends to vanish for $F' \rightarrow \infty$. It is demonstrated (see Appendix 1) that trained workers receive the same wage from the two firms, so that $w_{2i}^* = w_{2j}^* = w_2^*$.

In the first period, the firm has to decide how many unskilled workers to hire and train. At this stage the firm takes into account the total amount of profits over both periods, given the wage to be paid in the second one

$$p_{1+2,i} = (n_1 - d - w_{1i})N_i + (n_2 - w_{2i}^*)F(w_{2i}^* - w_{2j}^*)(N_i + N_j) - C(N_i).$$

In solving this problem the firm must respect the workers' participation constraint given by $2n_1 \leq w_1 + w_2$, from which the condition $w_1 \geq 2n_1 - n_2 + k$ descends. The firm chooses the lowest wage level satisfying it, that is $w_1^* = 2n_1 - n_2 + k$, with $w_1^* = w_{1i}^* = w_{1j}^*$. In other words, under our hypotheses – of general training, perfect elasticity of unskilled labour supply, risk-neutrality and absence of liquidity constraint – workers accept to cut their wage in the period 1 as this gives the firm the incentive to provide training and enables them to earn the skilled wage in the subsequent period. Besides the workers, the firms too sustain a part of training costs even though skills are general. This derives from the fact that they reap some returns to training in period 2, when they expect to gain a positive surplus over skilled employment.

From the properties given above, $F(0) = \frac{1}{2}$, the firm's profits are

$$p_{1+2,i} = (n_2 - n_1 - d - k)N_i + \frac{1}{2}k(N_i + N_j) - C(N_i).$$

The first order condition relative to the number of unskilled workers hired and trained by the firm is

$$n_2 - n_1 - \frac{1}{2}k - d = C'(N_i^*)$$

where N_i^* is the optimal level for the firm i . The equivalence of wages paid by firms in both periods implies as well that they decide to train the same number of workers, $N_i^* = N_j^*$. To explain this result it must be recalled that the firm faces the risk of losing trained workers in the second period. Then, the expected value of the private marginal benefit stemming from training is just $\frac{1}{2}k$ instead of the entire value of the monopsonistic

rent k . The other half of this rent corresponds to the value of the externality caused by mobility of trained workers and it appears in the condition for the maximum profit with a negative sign. This externality depresses the firm's incentive to invest in training when labour market is not perfectly competitive and lowers the number of trainees below the socially optimal level.

4.3. Socially optimal level of training

The social surplus when firms train their workforce amounts to the increase of production less direct and indirect training costs. In our case, where two firms with an identical cost function are considered, this can be written as

$$S = (\mathbf{n}_2 - \mathbf{n}_1 - \mathbf{d})N - 2C\left(\frac{1}{2}N\right).$$

According to this function the following condition must be satisfied in order to achieve the first-best outcome

$$\frac{\partial S}{\partial N} = (\mathbf{n}_2 - \mathbf{n}_1 - \mathbf{d}) - C'\left(\frac{1}{2}N^f\right) = 0$$

where N^f indicates the number of trainees maximising social surplus. This result occurs when the market for skilled labour is perfectly competitive. In this case, with perfect mobility the firms pay a second period wage $w_2^* = \mathbf{n}_2$ and make zero profits. Moreover, given the workers' participation constraint, the first period wage is $w_1^* = 2\mathbf{n}_1 - \mathbf{n}_2$. It follows that the two-period profit function is

$$p_{1+2,i} = (\mathbf{n}_2 - \mathbf{n}_1 - \mathbf{d})N_i - C(N_i)$$

so that the firm finds profitable to train a number of workers N_i such that $\mathbf{n}_2 - \mathbf{n}_1 - \mathbf{d} = C'(N_i)$. As this condition is the same as the previous one, it follows that $N_i = N_i^f = \frac{1}{2}N^f$. In a perfect labour market firms provide exactly the socially optimal level of training (see Fig3). Furthermore, it is worthwhile to note that training is provided by the firm but is paid entirely by the workers by means of the reduction of the wage in the training period. When the skilled wage equals productivity, workers are induced to sustain the cost of training up to the first-best level.

HERE: FIG. 3

4.4. Training subsidy financed by a tax on profits

When labour market is imperfect a policy maker aimed at augmenting training incidence could pay a subsidy for every trainee. The aim of this section is to verify the effectiveness of such policy when the subsidy is financed by a tax on the firms' profits. In particular, we assume that in period 1 the firms are given a subsidy of value m for every trainee. On the other hand, in period 2 the firms will pay a tax proportional to the rate t imposed on the profits they make by employing skilled workers. The equivalence between subsidies and tax revenues at an aggregate level implies $(n_2 - w_2)tN = mN$ where, as stated above, $N = N_i + N_j$. The second period profit of the firm i is

$$p_{2i} = (n_2 - w_{2i})(1-t)F(w_{2i} - w_{2j})(N_i + N_j)$$

and the firm's optimal wage which results by posing equal to zero its first derivative is $\hat{w}_{2i} = n_2 - k$. This is the same as that without policy. Even in this case it can be demonstrated that the firms settle an identical wage $\hat{w}_2 = \hat{w}_{2i} = \hat{w}_{2j}$ (see Appendix 2). The first period wage results to be $\hat{w}_1 = 2n_1 - n_2 + k$. Moreover, by substituting \hat{w}_2 in the equivalence condition and simplifying, we can write $kt = m$. Then the two-period profits are

$$p_{1+2,i} = (n_2 - n_1 - k - d)N_i + \frac{1}{2}k(1-t)(N_i + N_j) - C(N_i) + ktN_i$$

and the optimal number of trainees for the firm is given by

$$n_2 - n_1 - \frac{1}{2}k(1-t) - d = C'(\hat{N}_i).$$

As it is shown by Fig. 4, the level of \hat{N} rises when t increases, and reaches the first-best level $\hat{N}_i = N_i^f$ in the limit case $t = 1$ (the same holds true for the firm j). This demonstrates that a mechanism of subsidy and tax on profits can be effective in stimulating a higher level of training investment.

HERE: FIG. 4

Intuitively, this effect can be explained by the fact that the tax is proportional to total skilled workforce employed by the firm in the second period, either internally trained or poached from outside, while the subsidy is given only for trainees hired in the first period. In other words, this mechanism transfers profits from period

2 to period 1. From the firm's point of view this is not neutral since expected profits are reduced by the quitting probability of trained workers while subsidies increase profits of the first period with certainty.

4.5. Training subsidy financed by a tax on wage of the skilled workers

The subsidy can also be financed through taxation on wages earned by the skilled workers. In this case, in the first period the firm is given the subsidy m for each worker hired and trained and, on the other hand, a tax rate j is levied on the wage of trained workers in the second period. This introduces a tax-wedge such that if the firm pays w_2 , the take-home pay is $w_2(1-j)$. According to that, profits of firm i in period 2 are

$$p_{2i} = (n_2 - w_{2i})F'[w_{2i}(1-j) - w_{2j}(1-j)](N_i + N_j)$$

and the first order condition relative to wage is

$$(n_2 - w_{2i})(1-j)F'N = FN.$$

The firm's optimal wage we obtain from this expression is $\bar{w}_{2i} = n_2 - \frac{k}{1-j}$. As in the previous cases the firms pay the same wage (demonstration is analogous to those in Appendices 1 and 2). If $j > 0$, \bar{w}_{2i} is below the wage paid in the case with no policy. The reason is illustrated by the condition above. The left-hand term represents the net marginal benefit for the firm of an infinitesimal wage increase. Note that the reduction of the take-home pay caused by the tax weakens the ability of the firm to attract trained workers by means of a wage increase: the number of additional workers choosing the firm i as an effect of such increase amounts only to $(1-j)F'N$. On the contrary, the right-hand term says that any wage increase causes a rise of payroll costs, proportional to total workforce FN .

The take-home pay is $\bar{w}_2(1-j) = n_2(1-j) - k$ and, on the basis of the participation constraint, the first period wage is $2n_1 - n_2(1-j) + k$. Moreover, the equivalence between subsidies and tax revenues at an aggregate level implies $mN = \left(n_2 - \frac{k}{1-j}\right)jN$. According to that, the following two-periods profits function can be written

$$p_{1+2,i} = [-n_1 + n_2(1-j) - d - k]N_i + \frac{1}{2} \frac{k}{1-j} (N_i + N_j) - C(N_i) + \left(n_2 - \frac{k}{1-j}\right)jN_i$$

and the first order condition relative to the number of trainees results to be $n_2 - n_1 - d - k \left[1 + \frac{1}{1-j} \left(j - \frac{1}{2} \right) \right] = C'(\bar{N}_i)$. In equilibrium the number of trainees \bar{N}_i chosen by the firm is inversely related to the tax rate j . In general, we have $\bar{N}_i < N_i^*$ if $j > 0$. Taxation reduces the take-home pay, directly by levying the rate j , and indirectly since the wage becomes a less powerful instrument to attract trained workers, so that the firm finds less profitable to augment the wage. Furthermore, a lower wage implies a weaker incentive for the worker to finance training by cutting the first period wage. At the end, a smaller number of unskilled workers are hired and trained by the firm. This result is in line with theoretical draft anticipated in section 3 and with Stevens (1999), who maintains that a subsidy financed by a tax on wages is unable to rise the level of training in an imperfect labour market.

4.6. Training and bargaining over skilled workers' wage

So far we assumed that the wage is determined by a unilateral decision of the firm. However, it is worthwhile to consider the case of a bargaining with a workers' union in order to examine how this can affect firm's training decisions. For what concerns the implications of the interplay between wage bargaining and training investment there are not univocal results in the theoretical literature. In Acemoglu and Pischke (1998) firms find profitable to invest in workers' general training when unions cause a compression of the wage structure. Otherwise, the same can happen if a monopolist union determines wage and training intensity at an industry-wide level, which is the case examined by Booth, Francesconi and Zoega (1999, 2002). In fact, contrary to the firm, an industry-wide union doesn't suffer the externality caused by the probability of losing skilled labour after training. Nevertheless, also a firm-level union, as Booth and Chatterji (1999) demonstrate, can favour a first-best training investment by the firm. This happens because the higher skilled wage resulting from bargaining lessens the quitting probability of trained workers and increases the expected return to training for the firm. However, unlike the case of wage compression, in this case training results from a wider wage differential between skilled and unskilled labour. Finally, various cases of interplay between bargaining and training decisions are considered in Hart and Moutos (1995).

Here we assume that workers form an industry-wide union at the beginning of period 2 in order to contend with the firms for the distribution of the surplus $n_2 - w_2$. Bargaining occurs at the industry-wide level between the workers' union and an employers' federation. According to that an homogeneous wage is established. Bargaining follows Nash scheme. Union's objective is to maximize the earnings of the representative worker, whose outside option is the wage n_1 that he can earn in the primary sector if bargaining fails. On the other hand, the employers' federation intends to maximize the profits of firms in the period 2. The outside option for the firm in case of bargaining failure is zero profit ($p_2 = 0$). Let \tilde{w}_2 represent the bargained wage, so that the union's payoff is $W = \tilde{w}_2 - n_1$ and the firm's payoff is $p_2 = \frac{1}{2}(n_2 - \tilde{w}_2)N$. This corresponds to the profit function of both firms since, when an homogeneous wage $\tilde{w}_2 = \tilde{w}_{2i} = \tilde{w}_{2j}$ is established at an industry

–wide level, they stop competing each other by means of rising wage offers, and for the properties of the function $F(\cdot)$, it is $F(\tilde{w}_{2i} - \tilde{w}_{2j}) = F(0) = \frac{1}{2}$. The bargaining problem is

$$\underset{\tilde{w}_2}{Max} B = W^\beta p_2^{1-\beta}$$

where \mathbf{b} can be interpreted as the union's bargaining power. Then the outcome can be derived from the condition $\frac{\partial B}{\partial \tilde{w}_2} = \mathbf{b} \frac{\partial W}{\partial \tilde{w}_2} p_2 + (1 - \mathbf{b}) W \frac{\partial p_2}{\partial \tilde{w}_2} = 0$, which gives the value $\tilde{w}_2 = \mathbf{n}_1 + \mathbf{b}(\mathbf{n}_2 - \mathbf{n}_1)$. As the workers anticipate this outcome, they accept a first-period wage $\tilde{w}_1 = \mathbf{n}_1 - \mathbf{b}(\mathbf{n}_2 - \mathbf{n}_1)$, which satisfies their participation constraint. Substitution of \tilde{w}_1 and \tilde{w}_2 in the two-periods profit function of firm i gives

$$p_{1+2,i} = [\mathbf{b}(\mathbf{n}_2 - \mathbf{n}_1) - \mathbf{d}]N_i + \frac{1}{2}(1 - \mathbf{b})(\mathbf{n}_2 - \mathbf{n}_1)(N_i + N_j) - C(N_i)$$

from which the following first order condition results

$$\frac{1}{2}(\mathbf{n}_2 - \mathbf{n}_1)(1 + \mathbf{b}) - \mathbf{d} = C'(\tilde{N}_i).$$

The same outcome is obtained for the firm j as both firms pay identical wage rates. To be advantageous for the workers, bargained wage \tilde{w}_2 must be at least equal to the wage the firms would pay without bargaining w_2^* . Hence bargaining occurs if union possesses enough power according to $\mathbf{b} \geq \frac{\mathbf{n}_2 - \mathbf{n}_1 - k}{\mathbf{n}_2 - \mathbf{n}_1}$. When this inequality holds in strict sense, substitution of \mathbf{b} in the first order condition gives $\tilde{N}_i > N_i^*$ (and $\tilde{N}_j > N_j^*$). And in the limit case of $\mathbf{b} = 1$, the outcome would be $\tilde{N}_i = N_i^f$ (and $\tilde{N}_j = N_j^f$), the same as in the case of a perfectly competitive labour market. Hence, when a union bargains over the wage of skilled workers, a stronger incentive to train can arise for the firm. Notice that this derives as an indirect effect from the interplay of wage bargaining and training decisions, even if the firm continues to be the only decision-maker for what regards training. The explanation of this effect is that if the union gets a wage $\tilde{w}_2 > w_2^*$, the firm loses a fraction of the surplus k of the second period but, at the same time, it receives an equivalent sum through wage reduction in the first period. However, this is advantageous for the firm, as the expected value of one unit of the surplus in the second period is just $\frac{1}{2}$, as this is the probability of retaining the trained worker. According to that, the union may help to remedy the under-provision of training arising in an imperfect labour market. This result is consistent with the evidence emerging from several recent studies based on British dataset, as in Heyes and

Stuart 1998, Böheim and Booth 2003, Booth, Francesconi and Zoega 1999 and 2003, even if further research is required to identify exact causality links.

4.7. Wages, cost-sharing and training

In every case analysed and illustrated in Tab. 5, apart from that of imperfect labour market, the number of trainees can reach the socially optimal level. However, in the cases C and D this should request that parameters assume their extreme, and unlikely, values $b = 1$ and $t = 1$. The sum of the first and second period wages is whenever the same, equal to $2n_1$, while the difference between them differs. The largest wage differential between trainees and trained workers arises in a perfect labour market whereas in the case with union and bargaining the wage profile becomes steeper as the parameter b increases. Instead, cases A and C are characterised by the narrowest wage differential. Furthermore, in case C a higher number of trainees than in A is reached whenever $t > 0$ and without an enlargement of the wage differential. Steepness of wage profile over time is relevant if we admit that workers are risk adverse and credit constrained.

HERE: TAB.5

A major result of the model is the forecast of cost-sharing between worker and firm. The former finances training by lowering his wage of the period 1 below his reservation level of the same period, which is given by the wage paid in the secondary sector (n_1), by an amount equal to the increase of the second period wage above his reservation level of this period (n_1). For this reason, the total earnings of the worker over the two periods are whenever equal to his participation constraint $2n_1$, so that he doesn't get any net benefit from training. On the other hand, the firm equalises at margin benefits and costs of training and finds profitable to pay a sum equivalent to the increase of its profits. Under the hypothesis of a perfectly competitive labour market – in accordance with Becker (1962) – the worker bears the whole cost. Otherwise, when an imperfect labour market is considered, the worker and the firm share the costs. In period 2 the former obtains a wage $n_2 - k$, which implies a gain above the reservation level $(n_2 - k) - n_1$. Then he is ready to reduce the first period wage by the same amount. At the same time, the firm too finances training. Its investment amounts to $\frac{1}{2}k$, that is the expected value of the surplus it captures on each skilled worker employed in period 2. Then, the total investment is given by the sum of the contributions of the two parties (minus the indirect cost d) and corresponds to the value deriving from the first order condition.

4.8. Main results

Some of the results obtained from the model can be useful to attempt a theoretical evaluation of effectiveness of the “interprofessional” Funds for continuous training recently established in Italy. Firstly, it is

confirmed that a training subsidy financed by a tax on wage of trained workers does not determine the desired effects. On the contrary, a subsidy can be effective if it is financed through profit taxation. Second, our results demonstrate that workers and firms share training investments and the proportion of the costs financed by each side depends on the distribution of benefits determined by structural features of the labour market. Third, when workers' union and employers bargain over wage of trained workers, a positive effect on the total number of trainees in the economy can arise. Yet, several basic assumptions that can limit the validity of these propositions in some respects must be recalled. First of all, we only considered the case of labour market imperfections without paying attention to the possibility of credit constraints preventing workers from investing in their training. Moreover, also 'training market' imperfections caused by substantial problems of asymmetric information between the firm which provides the training and the worker who pays for it should be considered. As in large part of the literature, our model is a static one, in the sense that it doesn't take into account explicitly of neither technical and organisational innovations nor the "culture" of the players (employers, workers, and their respective associations). To finish, the model concentrates on incentive structure underlying training investment decisions and on its sensitivity to alternative policies, without considering a set of further institutional factors – as arrangements of working and training-time, workforce classification inside the firms, and certification – which play a major role in training systems.

5. Implications for the “interprofessional” Funds and the role of the social parties for what concerns continuous training

a) Tax on wages vs tax on profits

The first implication for the training policies effectiveness and for the definition of the social parties' role, concerns the alternative between tax on wages and tax on profits. The theoretical analysis establishes the limits of effectiveness of each of these two options in connection to the different markets structural conditions. Therefore it is necessary to verify if the design of the financial mechanism of the Funds is adequate to reality.

The 0,30% levy consists, in actual fact, of a tax on the wage extended to the entire duration of the employment of the worker (and for all workers, qualified or not). As such, in general this determines a reduction of the net wage earned by the worker, and at the same time, a higher labour cost for the firm. The measure of these two effects does not depend on the subject (in this case the firm) upon whom the tax is levied. Instead, it varies depending upon the elasticities of labour demand and supply. Since it is based on a tax on the wage, the effectiveness of the financial mechanism should be at its best when scarcity of training is due to an excessive burden and a lack of credit. On the contrary, it should be very low in the case of imperfect labour market. It is not easy to empirically verify which are the most relevant market failures and their influences on private decisions concerning training. The available evidence, as regards this, is indirect and fragmentary. Econometric estimates conducted on a panel of European countries have confirmed that training incidence – according to what is foreseen from the uncompetitive theories of the human capital – is positively correlated to the level of wage compression (Brunello 2002, Bassanini e Brunello 2003). Nevertheless, what remains in doubt

is the importance of this effect, and through which mechanism it operates specifically in Italy. In accordance with econometric estimates conducted on data concerning Italian firms and workers, training seems to have a positive effect on productivity and no impact or hardly any impact on the wage, with the consequence that firms would capture the greatest part of the return to training (Bassanini 2004, Conti 2004).

Moreover, labour mobility within the Italian economy is likely to be conditioned by a strong capacity of attraction of skilled labour employed in small firms to larger firms. Contini e Revelli (1992) and more recently, Contini (2002) have specified such a hypothesis with reference to the industrial sector, within which they found considerable flows of workers moving on to larger firms, after having acquired human capital in the medium e small sized firms. The existence of large gaps of labour productivity and profit between small and large firms, to the advantage of the latter, (ISTAT 2003) reinforces this explanation. As far as larger firms are concerned, it seems evident that given the fiercer competition in products markets, the diffusion of flexible organizational models and the appearance of professional key-figures which are new and transversal to different industries, the capacity of internal labour markets to provide for competence demands in a satisfactory way is at present drastically lower than in the past, and consequently firms are inclined to behave in a more aggressive way in their search for qualified staff (see e.g. Finegold and Wagner 2002, Gautié 2004). In short, evidence seems to indicate that in the Italian economy imperfections of the labour markets and labour mobility are combined in such a way as to generate a disincentive to training investments.

Although this does not exclude that even credit constraints can exist, nonetheless, it creates serious doubts on the effectiveness of the Funds' financial mechanism, which is based on a tax on the wages. In this case a loan derived from a tax on profits could be more effective. Yet, further considerations can, on the contrary, justify the choice of taxation on the wages. Firstly, we have to consider that the subsidy disbursed by the Funds is a selective one, since it assumes the submission of a training plan by the firms and an evaluation of it by the Fund itself. Consequently, if not at an aggregate level, the mechanism could result effective at least towards those groups of firms and workers who actually receive the subsidy and benefit from an amount of resources greater than the tax paid (see also Stevens 1999). A second, institutional, consideration appears to be important in this case. In a system financed through tax on profits it would be more difficult the acknowledgement of a sharing of power over training policies on equal terms between social parties. On the contrary, training regards the interests and choices of both firms and workers, and therefore, it seems preferable that the competences over it are shared by both parties (Ok and Tergeist 2003, Croce 2005).

b) Compression vs enlargement of wage differentials

One of the effects of a centralized wage bargaining consists of a relatively high level of wage compression. If this compression concerns also the differential between labour with different levels of qualifications, this can determine favourable conditions to an investment on training by the firms independently of the specific or general content of the training. With regards to the objective of training promotion, a strategy that could be implemented by the unions is the following: on one hand, a relatively high minimum wage, valid also for the training period, could be fixed and, on the other, a skilled wage lying below the productivity level

should be accepted. The result would be a degree of wage compression that could stimulate the investment by the firms (Acemoglu and Pischke 1998, 1999). Yet, in order to achieve this, the adhesion level of the firms and workers to the bargaining outcomes should be very high, in order to prevent wage competition between the firms for the recruitment of skilled workforce in the external market. Such a condition does not seem, at present, easy to achieve as rapid technological innovations with the consequent imbalances in the labour markets and wide skill shortages are experienced (Finegold and Wagner 2002). Generally, in last decades advanced economies exhibited a widening gap between the wages of skilled and unskilled workers.

To face this difficulty, the theoretical analysis suggests an alternative strategy. In the model above, the collective bargaining over skilled wage at an industry-wide level implies an increase in the number of trained workers. This effect, as we have seen, is obtained through an increase of the wage differential between trainees and trained workers. The implication that emerges for the unions is, therefore, that of contracting the increase of the wage differential connected to the levels of the workers' qualifications, also by means of a temporary reduction of the wage in the training period. This would constitute a form of participation to the investment in workers' human capital, in exchange for the power of intervention and control over the decisions concerning the quantity and the quality of training provided with by firms, as well as the distribution of it among all the workers. With the establishment of "inteprofessional" Funds, a considerable amount of resources are channelled in favour of training policies managed by the social parties and the power of decision-making with regard to this matter is assigned to them on equal terms. This could represent a favourable context for the adoption of this second strategy.

Nevertheless, the increase in wage differentials could result as a non feasible strategy if workers are credit constrained and the return to training is highly uncertain. Furthermore, the union could accept this strategy only within certain limits for equity considerations. In all these cases the exchange between a lower wage in the training period and a higher future wage could be hard to put into practice. On the other hand, as far as continuous training is concerned, the participation of workers to the financing of it can also occur through other ways than a wage reduction. In particular, proper working and training-time arrangements and changes of work organization could allow for a more efficient distribution of costs between workers and firms. At the same time, a part of productivity gains could be assigned to finance training.

c) Selectivity vs. wide accessibility of training

Through a detailed analysis of the design of the Funds' financing mechanism it emerges that it is based on a levy of modest entity in relative terms – compared, for example, to the similar contribution established by the French legislation, that reaches 1,50% (1,60% from 2005) for the firms with at least 10 employees – spread over all the employees (both skilled and unskilled). In addition, the subsidy is granted only to selected training plans, to the advantage of a relatively limited number of firms and workers, so that its amount can be considerable. The mechanism, therefore, presents a redistributive effect which, as already mentioned, confers a selective effectiveness in favour of beneficiaries.

Such a redistributive effect appears to be justified as an implicit sanction against those firms that do not intend to carry out any training at all and, therefore, can be considered to be potential free riders. Nevertheless, this impact can result to be biased and not equitable. Biased since, due to the heterogeneity of firms and workers, it is likely that small firms and weaker workers do not benefit from the subsidy, with cumulative consequences of segmentation, increase in disparity, and inefficiency. Moreover, it could be not equitable since a paradoxical situation can emerge in which through the levy – paid by all firms (small and large) and by all workers (skilled and unskilled) proportionally to an identical tax rate – , the unskilled workers contribute to fund the further training of skilled workers but are unable to participate to training. Observable experiences indicate that the availability of subsidies is not sufficient in itself to remove non-financial constraints that hamper training in small firms (Gasskov 2000, and Pukkinen et al. 2001). The risk is that these do not join the Funds or that, after joining them and contributing to their funding, they don't benefit from them in a proper measure. Provisional data highlight that the percentage of firms joining the Funds on the total number of those potentially interested is clearly lower than the percentage of workers involved, confirming that it is mostly the larger firms that benefit from the new instrument.

The financial source of the Funds, which corresponds to that of the compulsory contribution against the risk of involuntary unemployment, excludes from the potential receivers of training, the categories of subjects not included in the original field of applications of the contribution itself, in large part coinciding with segments of disadvantaged workers or others for whom it could be of great advantage to resort to training. Amongst these there are, in particular, autonomous workers, owners of small firms, craftsmen and cooperative associates but also various types of collaborators (Ministry of Labour 2003). Besides this exclusion caused by formal eligibility criteria, a further concern is that the resources will be spent by the Funds almost only in favour of the categories already most represented among the participants to continuous training, that is to say, young people, full-time and permanent workers, those with a high level of education, and with middle and high-level qualifications (ISFOL 2004).

In face of this predictable selectivity, the orientation of the Ministry of Labour seems to be that of specializing the various instruments on different targets. By this way the training sponsored by the Funds would be addressed to the 'higher' segments of the workforce, which are the most important from the firms' point of view, while the training financed through the FSE and the laws n.53/2000 and n. 236/1993 to the weaker subjects. Two recent measures adopted in execution of these laws are moving in this direction. The first one reserves 5% of the resources for training leaves (30 million euros) to spread information in order to enlarge the range of beneficiaries. The second one assigns 70% of the resources distributed to the Regions (50 million euros) to interventions in favour of the categories of workers with a major difficulty to enter training².

² This deals with a) workers of private firms with less than 15 employees, b) workers of any private firm with part time work or full-time contracts, or on a continual coordinated cooperation as well as in a limited contractual typology, of a modulated, flexible or project nature, foreseen by law n.30 of 23/02/2003, c) workers of any private firm placed on ordinary or extraordinary integrated cash, d) workers of any private firm with less than 45 years of age, and d) workers of any private firm in possession of an elementary or a compulsory school certificate.

On one hand, the specialization of the various instruments on the basis of the type of trainee can be appreciated for the discretion allowed to the Funds in addressing the resources but, on the other hand, it risks to create a double channel, the first one managed by the Funds in view of training of a strategic value for the firms, and the second one merely of a compensatory nature addressed by public intervention to the weaker subjects. The risk is that this second channel remains not connected with the firms' key-strategies and will end up in supplying training of a lower quality. An alternative solution would be a reform of the 0,30% contribution originally finalized to cover the risk of unemployment. Yet, this would represent a broader intervention on the unemployment insurance system. At the present stage, instead, it could be easier that the social parties, within the perimeter of the Funds' competences, would promote the training of the weaker workers and in small firms. It should also be noted that these subjects contribute to finance the Funds and, therefore, it would not be easy to justify to burden other public resources with the cost of their training.

d) Further implications on the role of the collective bargaining

Since training entered amongst the priorities of the social parties, a problem of coherence of the various contractual choices in respect to such an objective arose. Moreover, even if firms and workers recognize training as a shared objective, they maintain contrasting concerns over it. Wage bargaining itself, as we have seen, has an impact on the distribution of benefits and costs of training, and on the volume of training investments. Besides this, further arrangements of training co-financing exist, which can be suitable for continuous training. In particular, working and training-time management constitute an important instrument of training policy at the disposal of the social parties, together with the development of e-learning. Furthermore, the training demand by firms and workers depends upon various conditions which can be matter of collective agreements. The access conditions and criteria of selection of trainees, may constitute barriers to training participation. Other institutional elements may weigh heavily upon training incentives. Amongst these there are the certification of knowledge and competences, the personnel organization, and the internal and external mobility (Marsden 1999). Finally, the contents of training itself – particularly, its degree of transferability – from which different implications derive in terms of the distribution of benefits between workers and firms, should be well defined and monitored.

Faced with this wide spectrum of issues, collective bargaining in Italy still appears to be at its initial stage. The most recent national contracts define the primary role of training in relation to firms' competitiveness and workers' employability, nevertheless rarely do they pass from generic propositions to operative provisions (ISFOL 2004). Despite exceptions, even at the level of decentralized negotiations training still represents a quite marginal subject, as well as certification is a poorly treated matter (Ministero del lavoro 2002 and 2003). The consequence is that to date training is in fact a unilateral choice of the firms, with all the limits that may derive from this. From the ISFOL survey on large firms it emerges that only in 13% of cases the firms and the unions reach an agreement with regards to training and in no more than 10% of cases unions intervene on planning and realization.

6. Conclusions

The economic analysis indicates that the possible cause of an inefficient investment in the training of workers is the imperfect competition in the labour and credit markets, with different policy implications in the two cases. The empirical evidence for Italy in both cases is still scarce but allows one to assume that there are some remarkable imperfections in the labour markets which can affect private training choices. The analysis was developed through a two-periods model of training investment in an imperfect labour market. It shows that a subsidy may positively influence training decisions when it is financed through a tax on profits. This result raises some doubts, at a theoretical level, on the actual effectiveness of the new “interprofessional” Funds. In fact, in this case the subsidy is funded by means of a tax on wages. Yet, the tax-subsidy mechanism implies a redistribution effect thanks to which the groups of enterprises and workers that benefit from it perceive a net advantage and find it profitable to increase their investment in training. The mechanism, therefore, may result effective at least on a selective basis. On the other hand, it should be noted that the selective nature of benefits, worsened by the ineligibility of certain categories of workers, could prevent continuous training from being effective in augmenting the percentage of workers who participate to training and in contrasting the effects of precariousness and segmentation in labour markets.

The theoretical analysis gives some insights of the deep connection between training policies and wage bargaining. The results indicate that the union may help to remedy the under-provision of training arising in an imperfect labour market. However, it must be recalled that we made the hypothesis that the union represents only skilled labour. Further research should verify how the results change if this assumption would be removed. Due to the entry of continuous training in the agenda of social parties, a problem of consistency arises between training choices and other issues like that of wage determination, mobility, organization, certification, and working and training-time. To this regard, if workers’ continuous training represents a key-element for the unions, a new strategy may be at their disposal: by virtue of the establishment of the “interprofessional” Funds it is now possible for them to accept a temporary flexibility of wages and working-time in exchange for the power of decision and control over training policies.

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Appendix 1

Following Stevens (1996), profit equations of the two firms in period 2 are

$$p_{2i} = (a_2 - w_{2i})F(w_{2i} - w_{2j})(N_i + N_j)$$

$$p_{2j} = (a_2 - w_{2j})[1 - F(w_{2i} - w_{2j})](N_i + N_j)$$

Then first-order conditions are

$$(a_2 - w_{2i}^*)F'N = FN$$

$$(a_2 - w_{2j}^*)F'N = 1 - FN$$

The solution of these gives the optimal wages $w_{2i}^* = \mathbf{n}_2 - \frac{F}{F'}$ and $w_{2j}^* = \mathbf{n}_2 - \frac{1-F}{F'}$. If we define $x = w_{2i} - w_{2j}$, it results $w_{2i} - w_{2j} = \frac{1-2F}{F'}$. Given the properties of $F(\cdot)$, for which $F(0) = \frac{1}{2}$, this equation is valid only if $x = 0$.

Appendix 2

In this case it is possible to proceed in a way like that in the Appendix 1. The profit equations in period 2 are:

$$\begin{aligned} p_{2i} &= (\mathbf{n}_2 - w_{2i})(1-t)F(w_{2i} - w_{2j})(N_i + N_j) \\ p_{2j} &= (\mathbf{n}_2 - w_{2j})(1-t)[1 - F(w_{2i} - w_{2j})](N_i + N_j) \end{aligned}$$

and the first-order conditions

$$\begin{aligned} (\mathbf{n}_2 - \hat{w}_{2i})(1-t)F'N &= (1-t)FN \\ (\mathbf{n}_2 - \hat{w}_{2j})(1-t)F'N &= (1-t)(1-F)N \end{aligned}$$

The optimal wages which solve these conditions are the same as those obtained in the case without taxation, then it follows that $x = \hat{w}_{2i} - \hat{w}_{2j} = 0$ as demonstrated above in Appendix 1.

Tab. 1. Established “Interprofessional” Funds

“Interprofessional” Funds	Industries	Unions and Employers’ Associations
Fondo per le imprese FONDIMPRESA	Industria	Confindustria, Cgil, Cisl, Uil
FONDO FORMAZIONE PMI	Industria	Confapi, Cgil, Cisl, Uil
Fondo per il terziario FOR.TE	Terziario, comparti del Commercio, turismo, servizi, creditizio-finanziario, assicurativo, logistica–spedizioni–trasporto	Confcommercio, Abi, Ania, Confetta, Cgil, Cisl, Uil
Fondo per il terziario FON.TER	Terziario, comparti del turismo e distribuzione servizi	Confesercenti, Cgil, Cisl, Uil
Fondo Artigianato FART	Artigianato, Piccole e medie imprese	Confartigianato, Cna, Casartigiani, Clai, Cgil, Cisl, Uil
Fondo per le imprese cooperative FONCOOP	Cooperazione	A.G.C.I., Legacoop, Confcooperative, Cgil, Cisl, Uil
Fondo dei dirigenti dell’industria FONDIRIGENTI	Industria	Confindustria, Federmanager
Fondo dei dirigenti del terziario FON.DIR	Terziario, comparti del Commercio, turismo, servizi, creditizio-finanziario, assicurativo e logistica–spedizioni–trasporto	Confcommercio, Abi, Ania, Confetta, Fendac, Sinfub, Fidia, Federdirigenticredito, ,
FONDO DIRIGENTI PMI	Piccole e medie imprese industriali	Confapi, Federmanager
FONDOPROFESSIONI	Studi professionali e aziende ad essi collegate	Consilp, Confprofessioni, Confedertecnica, Cipa, Cgil, Cisl, Uil

Source: Min. Lav. 2004

Tab. 2 – Number of firms joining the Funds and their dependent workers (november 2004)

“Interprofessional” Funds	Firms which joined a Fund	Dependent workers
Fondo per le imprese FONDIMPRESA	40.000	2.223.000
FONDO FORMAZIONE PMI	29.000	368.000
Fondo per il terziario FOR.TE	76.000	1.060.000
Fondo per il terziario FON.TER	40.000	275.000
Fondo Artigianato FART	144.000	597.000
Fondo per le imprese cooper. FONCOOP	8.000	265.000
Fondo dirigenti industria FONDIRIGENTI	10.000	63.000
Fondo dirigenti terziario FON.DIR	3.000	23.000
FONDO DIRIGENTI PMI	400	1.300
FONDOPROFESSIONI	13.000	51.000
TOTAL	362.000	4.925.000

Source: Min. Lav. 2004 on data INPS

Fig.1. Imprese tot. e imprese con 10-19 addetti che fanno formazione (in perc. su tutte le imp. e per corrispondente classe dimensionale), 1999, CVTS2-Eurostat .

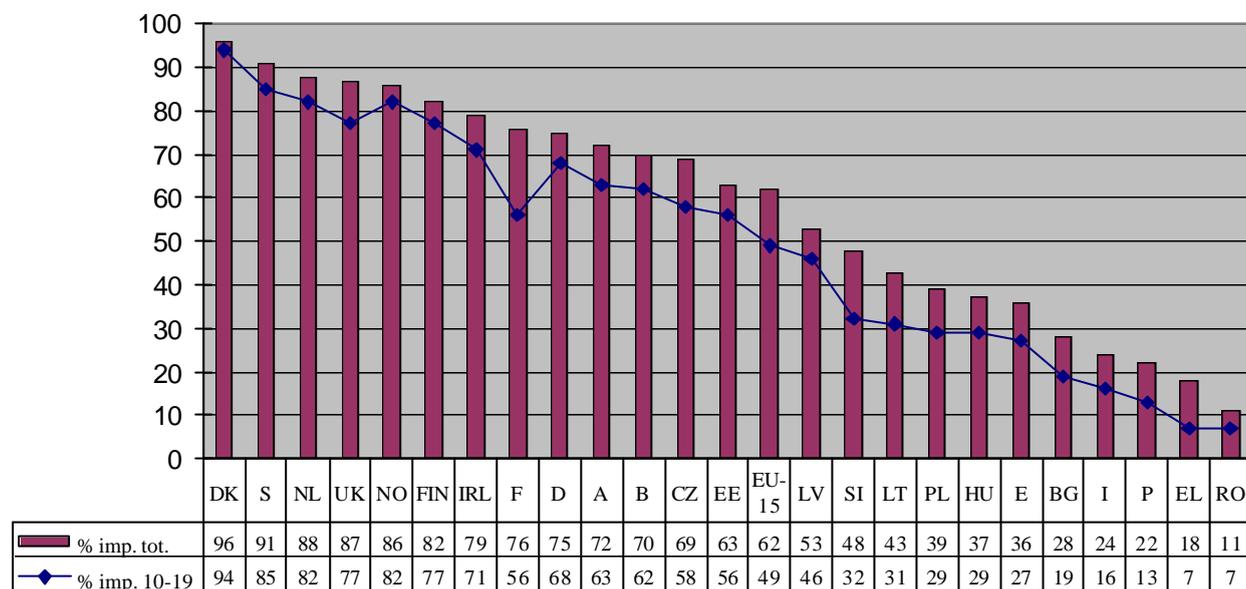
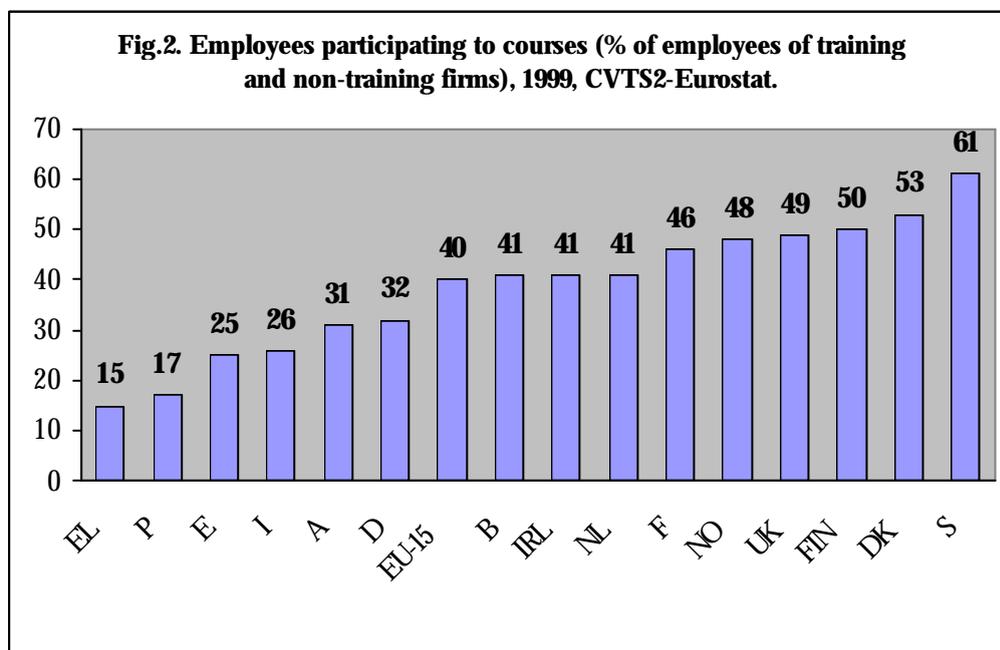


Fig.2. Employees participating to courses (% of employees of training and non-training firms), 1999, CVTS2-Eurostat.



Tab.3 Characteristics of dependent workers who participated to training per occupational group, % - Italy, 2003.

Characteristics	average	Managers and middle managers	Office workers, technicians and executives workers	Specialized and unskilled workers, clerks, cashiers
average	28,8	48,1	33,8	18,5
Males	32,2	49,1	38,8	21,4
Females	23,6	40,0	29,0	13,0
Age: up to 24	26,8	-	30,2	20,0
25-34	32,0	53,3	31,6	27,9
35-44	27,6	40,5	36,7	13,7
45-54	28,4	51,2	34,2	15,2
55 and more	16,9	30,8	23,8	4,0
University degree	51,7	53,2	49,4	53,8
High school	31,6	47,6	33,3	19,8
Vocational school	28,1	66,7	25,0	27,0
Secondary school	16,2	21,4	24,6	14,5
Primary school	12,5	-	20,0	11,1
<10 employees	20,6	53,1	20,5	14,8
10-49 employees	21,4	22,7	29,1	13,1
50-249 employees	29,7	54,5	37,0	18,5
250 and more	43,7	53,8	49,5	29,5
industry	24,0	36,8	30,6	18,5
building	25,9	53,3	28,4	15,7
commerce	19,5	60,0	21,5	12,0
services	39,9	51,5	42,8	24,3

Source: Min. Lav. 2004, data MLPS-Isfol

Tab. 4 –Policies of funding of continuous training

Causes of inefficient training	Remedies
Imperfect credit market	a. Public loans b. Subsidies financed through tax on skilled wage
Imperfect labour market	a. Regulation b. Subsidies financed through tax on profits

Tab. 5. Synopsis of the model results under different assumptions

Assumptions	Wage of the period 1	Wage of the period 2	Difference between wages of the two periods	First-order conditions relative to the number of trainees
A. Imperfect labour market	$2n_1 - n_2 + k$	$n_2 - k$	$2(n_2 - n_1 - k)$	$n_2 - n_1 - \frac{1}{2}k - d = C'(N_i^*)$
B. Perfect labour market	$2n_1 - n_2$	n_2	$2(n_2 - n_1)$	$n_2 - n_1 - d = C'(N_i^f)$
C. With subsidy and tax on profits	$2n_1 - n_2 + k$	$n_2 - k$	$2(n_2 - n_1 - k)$	$n_2 - n_1 - \frac{1}{2}k(1 - t) - d = C'(\hat{N}_i)$
D. With industry-wide wage bargaining	$n_1 - b(n_2 - n_1)$	$n_1 + b(n_2 - n_1)$	$2b(n_2 - n_1)$	$\frac{1}{2}(n_2 - n_1)(1 + b) - d = C'(\tilde{N}_i)$

