



Market imperfections and firm-sponsored training[☆]

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ABSTRACT

Using worker and firm data from Dutch manufacturing, our paper investigates how product market competition and labor market imperfections affect firm-sponsored training. We find that product market competition does not affect the firms' training expenditures. Increasing competition, for instance due to increased international integration and globalization, is not a threat to investments in on-the-job training. Instead, labor market imperfections influence firm-sponsored training. An increase in labor market flexibility significantly reduces the incentives of firms to invest in training. The magnitude of this effect is nevertheless small.

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1. Introduction

On-the-job training of employed workers is important because, at macro level, the accumulation of human capital is the main engine of growth (Lucas, 1993) while at micro level, on-the-job training is a key factor for a sustained competitive advantage (Wright et al., 1995).¹ To the extent that investments in training of workers are beneficial to

labor market performance and economic growth, it is relevant to understand firms' main determinants of these investments.

According to non-competitive theories of training, labor market imperfections and product market competition are determinants of firms' investments in the training of their employees. There may be different sources of labor market imperfections affecting firm-sponsored training.² First, search frictions could make it difficult for workers to quit and find a new suitable job (Acemoglu, 1997).³ If an employee needs time to find a new job rewarding her human capital, the current employer can momentarily extract rents from the worker and recoup training investments. Second, information asymmetries about the amount of training the worker has acquired with the current employer (Katz and Ziderman, 1990; Chang and Wang, 1996) and/or about workers' ability (Chang and Wang, 1995; Acemoglu and Pischke, 1998) could make potential future employers unwilling to pay workers for *ex ante* unverifiable productivity. This generates *ex post* informational monopsony power and makes it profitable for the current employer to sponsor general training. Moreover, according to

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¹ Several studies find that firm-sponsored training has a positive impact on productivity. See, among others, Bartel (1994, 1995), Barrett and O'Connell (2001), Conti (2005), Dearden et al. (2006), and Zwick (2006).

² See Leuven (2005) for a detailed survey of the theoretical sources of imperfect competition leading to firm-sponsored training.

³ See also Shintoyo (2008) for a search and matching model with firms that create job vacancies and are willing to sponsor general training.

Manning (2003) a perfectly competitive labor market is likely to deliver an efficient level of training as no potential future employers of a worker can expect to make profits on them. However, also a very monopsonistic labor market will deliver an efficient level of training as there are few future employers to make profits out of the trained worker. Stevens (2001) presents a model of a training market with credit constraints and labor market imperfections. She shows that labor market imperfections reduce the demand for training and increase the supply for training. The demand effect dominates with a perfect capital market. With credit constraints, the supply effect may prevail and labor market imperfections may increase training and welfare of workers and firms.

Firm-sponsored training may also be influenced by competition in the product market. Gersbach and Schmutzler (2010) argue that the softer the competition, the higher the training incentives. The reason is that, when competition on the product market is weak, the risk of competing firms poaching trained workers is low. Brunello and De Paola (2008) show that the relationship between product market competition and training can be ambiguous: if an increase in competition affects the proximity of workers and firms, the negative effect of poaching on training can be compensated by positive local agglomeration effects. Finally, Bassanini and Brunello (2010) predict a positive effect of product market competition on firm-sponsored training: with tougher product market competition, it is relatively more important for firms to employ a better skilled workforce.

Existing empirical studies on the effect of market imperfections on firm-sponsored training display mixed results. Autor (2001) focuses on temporary help supply firms in the US, finding that firm-provided training increases with product market competition. Bassanini and Brunello (2010) examine 15 European countries and 12 industries finding that an increase in product market deregulation generates a sizeable increase in training incidence. Görlitz and Stiebale (2011) find instead no significant effect of competition measures on training in Germany. Muehleemann and Wolter (2007) and Muehleemann (2008) find that Swiss firms are less likely to provide apprenticeship training in dense regional labor markets, where the probability that workers are poached by other firms is likely to be higher. Brunello and Gambarotto (2007) find that in the UK firm-sponsored training is less frequent in areas with higher local employment density.

Clearly, non-competitive theories of training provide ambiguous predictions about the effect of market imperfections on firm-sponsored training. Furthermore, empirical studies on training display mixed results. This calls for additional research, which we provide. Our paper contributes to the empirical literature on firm-sponsored training. We investigate whether and to what extent labor market imperfections and product market competition affect firm-sponsored training. So far, these potential determinants have not received a lot of

attention in the empirical literature (see, e.g., Lynch and Black, 1998). Yet, in a changing economic environment in which labor markets have a tendency to become more flexible and product markets have a tendency to become more competitive through a process of international integration, understanding these relationships is important from a policy point of view. We improve upon previous empirical studies which have attempted to directly test the predictions of non-competitive models of training by disentangling the effect due to labor market imperfections from the effect due to product market competition. Labor market imperfections and product market competition may be correlated across markets but, as we show, this correlation is far from perfect. This allows us to establish the effects of both potential determinants separate from each other.

Our empirical analysis is based on Dutch worker and firm data. The worker data are informative on individual wages and labor market transitions which allow us to determine the degree of labor market imperfections. The firm data are informative on firms' revenues and costs which allow us to establish the extent of product market competition. The estimation strategy to identify the impact of both product market competition and labor market imperfections exploits their variation across markets and over time. We use econometric techniques that control for firm unobserved heterogeneity and we perform robustness check to test whether the results might be biased by too strict parametric assumptions. We find that an increase in labor market flexibility significantly reduces firms' training expenditures. Instead, product market competition does not have an effect on firm-sponsored training. From this we conclude that competition policy and increasing international competition will not pose adverse effects on firm-sponsored training of workers. An increase in labor market flexibility, for example because of a reduction in employment protection, will lead to a lower training incidence. However, the size of this effect is rather small compared to the cross-sectional variation in the incidence of training.

Our paper is organized as follows. The data are described in Section 2. Section 3 presents the indexes of market imperfections we use to test non-competitive training theories. The econometric model and estimation results are presented and discussed in Section 4. Section 5 concludes.

2. Firm-sponsored training

The data we use in our empirical investigation are gathered by Statistics Netherlands at the level of both workers and firms. We use the information about firm-sponsored training at the level of firms, i.e. whether or not firms participated in training of their workers, and if so how much money was spent on this. The firm data are also used to compute the product market competition index at the 3-digit SIC industry level. The firm data come from the 2000–2005 waves of the Industry Production Survey (PS). All the Dutch manufacturing firms with

Table 1
Summary statistics, 2000–2005.

	Firm data on training			Worker data	
	Fraction of firms investing in training (%)	Yearly expenditures in training per unit of labor, unconditional on investing in training (€)	Yearly expenditures in training per unit of labor, conditional on investing in training (€)	Gross hourly wage (€)	Elapsed job duration (years)
2000	–	–	–	15.89	12.6
2001	76.2	260	340	15.85	12.6
2002	66.0	237	360	15.81	12.7
2003	62.6	213	341	15.97	12.7
2004	59.6	194	325	16.08	12.8
2005	57.7	207	359	16.09	13.1
Overall	63.5	220	345	15.95	12.8
Standard deviation	48.1	470	550	6.52	10.4
Minimum	0.0	0	3.9	6.52	0.0
Maximum	100	25,350	25,350	46.33	51.2
No. of observations	No. of firms: 26,707			No. of workers: 2,327,036	
No. of years	5			6	

Note: Hourly gross wages are in real terms in 2005 prices (CPI in 2005 = 100).

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