Employer Size and the Structure of Wages: A Critical Survey

Thierry Lallemand * and François Rycx **

Abstract – *This paper provides a critical survey of the economic literature on the potential effects of employer size on the structure of wages. Two questions are examined both from a theoretical and empirical perspective. Firstly, we investigate why (on average) large employers pay more than small employers. We also examine whether the magnitude of the employer-size wage premium varies across countries and is affected by labour market institutions. Secondly, we focus on the relationship between employer size and the dispersion of wages, both within and between establishments. Particular attention is devoted to empirical results obtained for the Belgian economy.*

JEL Codes: *J21, J31*
Key words – *wage structure, employer size.*

1 INTRODUCTION

This paper provides a critical survey of the economic literature on the potential effects of employer size on the structure of wages. Two questions are examined both from a theoretical and empirical perspective. Firstly, we investigate why (on average) large employers pay more than small employers. We also examine whether the magnitude of the employer-size wage premium varies across countries and is affected by labour market institutions. Secondly, we focus on the relationship between employer size and the dispersion of wages, both within and between establishments. Particular attention is devoted to empirical results obtained for the Belgian economy.

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2 THE EMPLOYER-SIZE WAGE PREMIUM

2.1 Theory

The existence of a positive effect of employer size on workers' wages is well documented in the economic literature (Oi and Idson, 1999a). Yet, there is little consensus about the particular reason why large employers pay higher wages (Winter-Ebmer and Zweimüller, 1999). Differences in both human and physical capital investments between employers of different sizes are at the basis of various theoretical explanations for the size wage premium. According to Hamermesh (1980), large employers hire higher-quality workers due to their greater capital intensity and the capital-skill complementarity. Economies of scale and other financial advantages (*e.g.*, lower interest rates) are often mentioned to explain why large employers might invest more in both human and physical capital. The point is that large employers can spread the fixed costs of their investments across more output and workers. Therefore, it would be relatively less costly for them to adopt advanced technologies, which in turn require more skilled labour (*e.g.*, Dunne and Schmitz, 1992). Black *et al.* (1999) developed a model where the size wage gap is explained by a training size differential. They argue that cost advantages allow large employers to implement stronger formal and informal training systems, which are essential for an efficient use of advanced technologies. A complementary argument to explain why large organizations might employ more high-skilled workers has been developed by Troske (1999). Starting from the hypothesis of Kremer and Maskin (1996)[1], the author argues that if there are fixed costs associated with employing high-skilled workers (*e.g.*, due to more formal recruiting and training processes), large employers should have advantages in matching them together.

Compensating wage differentials may also account for the employer-size wage premium. According to the standard competitive model of the labour market, where the equilibrium wage is determined through marginal productivity, two individuals with identical productive characteristics necessarily receive the same wages. However, compensating differences may occur between similar individuals placed in different working conditions. Indeed, the disutility undergone by one individual following the performance of a task in an unfavourable situation may lead to wage compensation. For a long time, working conditions were considered to be worse within large organizations. Large employers were suspected to offer *inter alia* a more impersonal work atmosphere (Lester, 1967), to decrease the freedom of action and scheduling (Masters, 1969), and to generate longer commuting (Scherer, 1976). This perspective has been challenged at glance by Brown *et al.* (1990) and later on by Oi and Idson (1999b). Both studies show some evidence on superior working conditions in large enterprises. More particularly, Oi and Idson (1999b) argue that large firms typically offer jobs with i) cleaner and safer workplaces, ii) more generous time-off benefits, and iii) superior fringe benefits. Moreover, they suggest for the US that observable working conditions are better within large firms and therefore can not contribute to the firm-size wage premium.

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1.   Following Kremer and Maskin (1996), employers prefer to match workers of similar skills together.

Job stability may also explain the existence of an employer-size wage premium. Doeringer and Piore (1971) emphasized that internal labour markets facilitate the evaluation of the worker's performance and generate higher returns to human capital investments. The point is that the internal mobility of workers tends to reduce the worker turnover within junior workers and to decrease the incentives for senior workers not to share their knowledge with new workers (Criscuolo, 2000). Lower worker turnover means in general lower adjustment and monitoring costs. Therefore, it can be argued that internal worker's mobility is beneficial for an employer. The same is true for the workers since it increases job stability. To put it differently, it improves career prospects and reduces the threat of unemployment. Let us also notice that the stability of the workforce is expected to be higher within large organizations because the latter provide more intensive training programs (Idson, 1996; Black *et al.*, 1999; Winter-Ebmer, 2001) and face a lower risk of bankruptcy (Idson, 1996).

Another possible explanation for the elasticity between size and wages is that large employers have a greater ability-to-pay. The argument is that the latter are more likely to operate in imperfect competitive markets (Albaek *et al.*, 1998). Therefore, large employers can accumulate more monopoly rents that they may share with their workers (Slichter, 1950; Weiss, 1966; Mellow, 1982).[2] Hierarchical matching models predict moreover that workers of higher ability should match with job with more responsibilities in larger firms (*e.g.*, Garicano and Rossi-Hansberg, 2006). In other words, these models explain the employer-size wage gap as evidence that more able workers sort to large firms due to hierarchies which amplify managerial abilities of workers. According to the 'skills-weight' approach of firm specific human capital developed by Lazear (2003), the employer-size wage premium could also be due to differences in employers' abilities to cater to workers' skills. Finally, consistent with monopsony models, the employer-size wage premium may be interpreted as evidence in favour of an upward-sloping labour supply curve to an individual employer (Manning, 2003).

Efficiency wage models provide a complementary explanation for the employer-size wage premium. The point is that in general the latter face higher monitoring costs. To reduce these costs they may pay efficiency wages, *i.e.*, wages that are above the market clearing level for a given quality of labour (Eaton and White, 1983). Indeed, efficiency wages attract workers with better skills and reduce shirking. In the Shapiro and Stiglitz's model (1984), the level of 'no shirk wage' or efficiency wage is negatively correlated with the detection rate. Since the detection rate is supposed to be lower within large organizations, efficiency wages are expected to increase with employer size.[3]

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2. Rent-sharing may arise for several reasons including collective wage bargaining or the employer's willingness to avoid unionisation. However, rent-sharing may also appear in the absence of trade unions (*e.g.*, Blanchflower *et al.*, 1996; Nickell, 1999; and Rycx and Tojerow, 2004). Let us also notice that, according to Brown *et al.* (1990) and Voos (1983), large organizations are more likely to be the target of union drives or to replicate union behaviour.

3. See also the discussion in *e.g.*, Lucas (1978), Oi (1983), Garen (1985) and Barron *et al.* (1987). An alternative version of the efficiency wage model, based on the employers' difficulty to infer workers' ability, has been developed by Weiss and Landau (1984).

2.2 Empirical evidence

What about the empirical results? In their seminal paper, Brown and Medoff (1989) examine the magnitude and causes of the firm-size wage premium in the US. Their results show that *ceteris paribus* working for a large firm (*i.e.*, a firm that is double the size of another) generates a wage premium of between 1.5 and 3.8%. However, they provide little evidence for traditional explanations including the labour quality hypothesis or size differences in working conditions[4]. The study of Idson and Feaster (1990) relative to the US is the first to address the potential selectivity problem, *i.e.*, the non random sorting of workers across employers of different sizes. To do so, they apply the two-step estimation procedure developed by Heckman (1976, 1979) and Lee (1978). Their findings, based on a discrete measure of firm size (5 categories), show that controlling for selection effects increases the magnitude of the size wage gap.

The paper of Schmidt and Zimmerman (1991) supports the existence of a significant firm-size wage premium in West-Germany. Moreover, their results indicate that the magnitude and significance of this premium is not reduced by the addition of many control variables, including tenure, innovative activities of firms, industry dummies, demographic variables, and work characteristics. Main and Reilly (1993) focus on the UK using a discrete measure of the establishment size (3 categories). Moreover, they try to correct for the potential selection bias by adopting the same methodology as in Idson and Feaster (1990). Their results show the existence of a wage gap of around 18 per cent between large and small establishments. They also indicate that traditional explanations do not much account for the size wage premium. Furthermore, in contrast to Idson and Feaster (1990), they do not support the hypothesis of a non random assignment of workers across different size classes. The size wage differential within Italian firms has been investigated by Brunello and Colussi (1998). Using a discrete measure of firm size (6 categories) and controlling for a potential selectivity bias, the authors find that the wage differential between small and large firms is not significantly different from zero. In other words, their results suggest that any wage premium is due to differences in the observed characteristics and selection effects.

More recent explanations of the size wage premium have been tested for the US by Bayard and Troske (1999). The authors use a continuous measure of the firm/establishment size and include supply-side variables directly in their wage regression. Their results show comparable, significant and positive establishment-size wage premia across industries (*i.e.*, manufacturing, retail trade and services). Moreover, according to the theory of Oi and Idson (1999b), their findings suggest that productivity differences between workers in large and small firms account for half of the firm-size wage premium in the manufacturing and service industries. However, they find that neither productivity nor segregation by skill accounts for the establishment-size wage premium.

A similar study has been undertaken with Belgian matched employer-employee data by Lallemand *et al.* (2005a). Their results show the existence of a significant

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4.   Morissette (1993) finds similar results for Canada.

and positive firm-size wage premium, even after controlling for many individual characteristics and working conditions. A substantial part of this wage premium derives from the sectoral affiliation of the firm. It is also partly explained by the higher productivity and stability of the workforce in large firms. Yet, their findings do not support the hypothesis that large firms match high skilled workers together. Finally, their results indicate that the elasticity between wages and firm size is significantly larger for white-collar workers and comparable in the manufacturing and the service sectors.

To get a better understanding of the employer-size wage differential, a number of recent studies rely on panel data techniques. Abowd *et al.* (1999) use a large matched worker-firm panel data set for France and find that individual heterogeneity rather than firm heterogeneity accounts for most of the wage gap between size categories. To do so, they isolate fixed individual and fixed firm effects from workers moving between employers.[5] Ferrer and Lluis (2004) examine the returns to unmeasured skills in Canada considering the non random assignment of workers into firms of different sizes. They apply GMM techniques to longitudinal data for the period 1993-98. Their findings, based on a discrete measure of firm size (3 categories), show that moves are equally distributed across firms of different sizes. They also suggest that moving to a larger firm generally increases the average wage, while joining a smaller firm may not lead to a wage cut[6]. Finally, they indicate that unmeasured skills (*e.g.*, initiative, ambition) are not significantly better rewarded within large firms. The authors attribute this finding to higher monitoring costs within large firms. A similar result has been obtained for Portugal by Silva (2004). Using longitudinal employer-employee data, covering the period 1993-98, the latter finds that observed skills generate higher returns in larger firms while unmeasured abilities are better rewarded in smaller firms.

Another issue is whether the magnitude and determinants of the employer-size wage premium vary across the industrialised countries. Due to the scarcity of harmonised data linking businesses and workers at the micro level in different countries, very little is known on this subject. As far as we know, the contributions of Albaek *et al.* (1998), Teulings and Hartog (1998) and Lallemand *et al.* (2005b) provide the only cross-country evidence on the employer-size wage gap. Albaek *et al.* (1998) focused on the Scandinavian countries using comparable data from registers and surveys. Their results suggest that the plant-size elasticity in Scandinavian countries is of the same order of magnitude than in other countries with totally different wage bargaining institutions, such as the US. In contrast, using similar individual surveys from seven countries, Teulings and Hartog (1998) show the existence of an inverse relationship between the employer-size wage premium and the degree

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5. An objection that can be raised against fixed effects estimates is that they assume that the workers' mobility is exogenous. If this is not the case, fixed effect estimates are inconsistent (Criscuolo, 2000). Another potential problem with fixed effect estimates is that they rely on the hypothesis that unobserved abilities are equally rewarded across firms of different sizes.

6. Using German panel data, Gerlach and Hübler (1998) find that: i) workers moving to smaller firms retain part of their initial size wage premium, and ii) workers moving to larger firms may have to accept wages below the average pay of incumbents with similar characteristics.

of corporatism.[7] Unfortunately, in both studies, results do not refer to the same year in all countries. Moreover, the use of self-reported information for some countries and data from registers for others may be misleading. To overcome these problems, Lallemand *et al.* (2005b) relied on harmonised matched employer-employee data covering five European countries in 1995. Their results show that the establishment-size wage premium fluctuates substantially across countries and appears to be negatively correlated with the degree of corporatism. Yet, caution is required as their analysis covers a limited number of countries, does not control for potential selection effects and is based on cross-sectional data.

3 EMPLOYER SIZE AND THE DISPERSION OF WAGES

3.1 Theory

While an abundant literature has focused on the employer-size wage premium, much less is known on the relationship between employer size and the dispersion of wages. However, the theoretical literature has already developed many explanations for a systematic connection between employer size and the dispersion of wages, both within and between establishments. Three broad categories of factors are generally put forward (Davis and Haltiwanger, 1995): the degree of technological diversity, non-competitive and institutional factors, and compensation schemes. These factors interact with employer size to either increase or decrease within- and between-establishment components of wage dispersion.

Production technologies used by establishments call for different kinds of workforce skills. Consequently, if employers of different sizes adopt various technologies, there could be differences in wage dispersion by establishment size. One can assume that if large employers are more diversified horizontally and vertically, the latter engage in a greater variety of tasks and need workers with more heterogeneous skills (Davis and Haltiwanger, 1995). Therefore, within-establishment wage dispersion should rise with employer size. However, Oi (1983) and Kremer (1993) expect the inverse relationship. In Oi's view, larger employers use standardised production technologies which call for a homogeneous workforce. Kremer (1993) argues that large employers adopt technologies with high skill complementarities which generate a lower dispersion of skills among workers. Davis and Haltiwanger (1995) rely on Lambson's theory of life-cycle dynamics of plants (1991) to suggest that between-establishment wage dispersion decreases with employer size. They assume that smaller employers are young and will experience different technologies

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7. The concept of corporatism, borrowed from political science resembles the level of centralisation of collective bargaining as well as the degree of coordination between the social partners. However, as this concept has not been defined in one single way, there are differences in opinion as to the relative position of the industrialised countries on the scale of corporatism (see the discussion in *e.g.*, OECD (1997, 2004)). The Scandinavian countries and Austria are nevertheless always in the category of strongly corporatist countries, whereas the US and Canada are invariably at the bottom of the ranking.

of production over time. Only those with a successful technology survive and become larger. In other words, the higher variety of production technologies between smaller establishments should lead to a greater diversity in average workforce skills. Therefore, between-establishment wage dispersion should be higher among smaller employers.

Wage structure differences can also arise from rent-sharing and from the diversity in workers' ability to extract rents across establishments of different sizes. Indeed, Davis and Haltiwanger (1995) suggest that intra-establishment wage dispersion depends on heterogeneity in workers' bargaining power. Assuming that high skilled workers have a stronger ability to extract rents and that large establishments employ on average more heterogeneous workers, differences in the bargaining power of workers are possibly stronger within large establishments. Hence, the dispersion of wages within establishments may increase with employer size.

Trade unions may also influence the structure of wages within and between establishments of different sizes. Several studies investigating differences in wage inequalities between unionised and non-unionised establishments have shown that unions i) make compensation schemes uniform across establishments and ii) tend to compress wages (Freeman, 1980, 1982; Gosling and Machin, 1994). In other words, within- and between-establishment wage dispersions are found to be lower within unionised establishments. It also appears that union power or threat is in general stronger within large companies (Voos, 1983; Brown *et al.*, 1990). Therefore, we may expect both between- and within-establishment dispersions of wages to fall with employer size. In continental Europe, the bargaining regime is quite different from the US pattern. Indeed, wage bargaining occurs at different levels: national, sectoral, regional and/or local. Several studies have shown that the level of collective wage bargaining has an impact on the dispersion of wages within and between establishments (Dell'Aringa and Lucifora, 1994; Dominguez and Gutierrez, 2004; Plasman *et al.*, 2005; Card and de la Rica, 2006; Dell'Aringa and Pagani, 2007). However, there is no consensus about the sign of this effect. Therefore, it is not clear whether large establishments, which are expected to renegotiate wages more frequently at the local level, should exhibit higher or lower levels of wage dispersion.

A last factor influencing the internal structure of wages is the type of compensation scheme. Tournament theories suggest that employers should implement some wage dispersion in order to foster the average worker's effort (Lazear and Rosen, 1981). McLaughlin (1988) adds that the higher the number of contestants for a prize (*e.g.*, bonus or promotion) the larger must be the wage differential to enhance worker's productivity. Accordingly, within-establishment wage dispersion is expected to rise with establishment size. However, considering an organisation in which some workers are non-cooperative ("hawks") while others are less aggressive ("doves"), Lazear (1989, 1995) argues that if workers can affect each other's output, standard pay rate policies could be more efficient. Also noteworthy is that efficiency wage models predict that wage differentials based on size differences can emerge from the higher monitoring costs borne by large employers. Indeed, Garen (1985) supposes that monitoring and screening costs are higher for large employers, and reduce their ability to differentiate wages according to workers' unobserved characteristics (*e.g.*, initiative, ambition, effort). In sum, assuming that monitoring costs are higher within large establishments and/or that workers are

less cooperative in the latter, intra-establishment wage dispersion should fall with employer size.

3.2 Empirical evidence

What about the empirical results ? As far as we know, Davis and Haltiwanger (1995) and Lallemand and Rycx (2006) provide the only empirical evidence on the determinants of wage dispersion among employers of different sizes. The study of Davis and Haltiwanger (1995) on the US manufacturing sector in 1982 shows the existence of wage structure differences among employers of different sizes. On the one hand, they use the full distribution accounting methodology of Juhn, Murphy and Pierce (1993) (hereafter JMP) in order to investigate how the wage distribution varies with establishment size. On the other hand, they examine how wage dispersion breaks down into within- and between-establishment components according to size. The authors show that within-establishment wage dispersion increases, in general, with establishment size. They also find that i) workers' heterogeneity tends to rise with establishment size and that ii) the contribution of unobserved characteristics to wage dispersion among workers is larger at smaller establishments. On the basis of these results, the authors attribute the positive relationship between establishment size and *within*-establishment wage dispersion to greater heterogeneity in workers' skills within large establishments. In other words, their results do not support the hypothesis that within-establishment wage dispersion increases with size due to stronger incentive-based pay schemes in larger establishments. Finally, they find that *between*-establishment wage dispersion decreases with establishment size. The authors attribute this result to the hypothesis that smaller employers are technologically more diverse than large employers.

The study of Lallemand and Rycx (2006) examines how the wage distribution differs among small and large establishments in four European countries (*i.e.*, Belgium, Ireland, Italy and Spain). To do so, they use a unique harmonised matched employer-employee data set, *i.e.*, the 1995 European Structure of Earnings Survey (ESES). Moreover, they implement the JMP decomposition of wages following the methodology suggested by Lemieux (2002). The advantage of this methodology is to isolate the contribution of returns to unmeasured workers' characteristics (*e.g.* ambition, initiative, effort). It thus enables to investigate whether there might be differences in the use of incentive-based pay schemes across employers of different sizes. Overall, findings reported by Lallemand and Rycx (2006) are very similar to those of Davis and Haltiwanger (1995) for the US.

4 CONCLUSION

This paper has surveyed the economic literature on the impact of employer size on the level and dispersion of wages both from a theoretical and empirical perspective. The overall conclusion is not clear cut.

The existence of a positive effect of employer size on workers' wages is well documented in the economic literature (Oi and Idson, 1999a). Yet, there is little

consensus about the particular reason why large employers pay higher wages (Winter-Ebmer and Zweimüller, 1999). Traditional explanations suggest that large employers: i) hire more qualified workers, ii) compensate workers for bad working conditions, iii) have more market power and share their excess profits with their workers, iv) avoid or mimic unionisation, and v) substitute high monitoring costs with wage premia. Empirical papers offer only partial evidence for these traditional arguments (*e.g.*, Brown and Medoff, 1989; Idson and Feaster, 1990; Schmidt and Zimmerman, 1991; Main and Reilly, 1993; Morissette, 1993; Lallemand *et al.*, 2005a). As a result, alternative hypotheses have been recently developed. Oi and Idson (1999b), for instance, suggest that workers are more productive in large firms and therefore ask for higher wages. Other explanations emphasize that large firms match more-skilled workers together (Kremer and Maskin, 1996; Troske, 1999) and create internal labour markets in order to increase the stability of their workforce (Idson, 1996). Be that as it may, the reason why large firms pay higher wages remains a complex and unresolved puzzle. Also noteworthy is that there is no consensus in the literature on whether the employer size wage premium varies significantly across countries and is correlated with labour market institutions (Albaek *et al.*, 1998; Teulings and Hartog, 1998; Lallemand *et al.*, 2005b).

While an abundant literature has focused on the employer size wage premium, much less is known on the relationship between employer size and the dispersion of wages. To the best of our knowledge, only two studies have examined this issue empirically (*i.e.*, Davis and Haltiwanger (1995) for the manufacturing sector in the US and Lallemand and Rycx (2006) for the private sector in four European countries). Although both studies do not rely on the same methodology, they end up with quite similar results. Their findings show that *within*-establishment wage dispersion rises with size because large employers have a more diverse workforce. They also suggest that smaller establishments more closely link pay to performance. Further results indicate that *between*-establishment wage dispersion decreases with employer size because smaller establishments are technologically more diversified and hence exhibit greater diversity in average workforce skills.

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