THE INSTITUTIONAL PULL TOWARDS INTERSECTORAL WAGE CONVERGENCE

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November 2018

IPSWICH WORKING PAPER 7



This research received funding by the Belspo, the Belgian Scientific Policy Office, within the Brain-be program that is oriented at providing scientific support for federal policies.

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Publisher: KU Leuven

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Abstract

There is a growing belief that increasing wage inequality and the growth of a low-wage labour market is not an unavoidable corollary of economic growth and technological progress, but that institutions play at least a moderating role. Using administrative wage data for the period between 1996 and 2015, we show that in Belgium strongly institutionalized wage setting and narrow margins for firm-level and individual wage bargaining increasingly leads to a pattern of synchronous wage evolutions across the wage distribution, stable inequality and real wage convergence across sectors, rather than sectoral polarization. This suggest that collective claims and coordinated wage setting are mediating factors in Baumol's cost disease. It shows that collective bargaining and the primary distribution of income can be an alternative to anti-poverty measures based on fiscal redistribution.

Acknowledgements

We would like to thank dr. Tim Goesaert and dr. Sam Desiere for assisting with the data cleaning, and the VIONA chair on labour market dynamics held by prof. dr. Ludo Struyven of HIVA KU Leuven for providing additional funding for the data and research.

Introduction

It has been demonstrated that over time, in industrial economies, income inequality has almost continuously and universally risen (Piketty, 2014; Piketty & Saez, 2003). The consensus among economists seems to be that technological progress is at the basis of this trend (see Acemoglu, 2002; Bound & Johnson, 1992; Juhn, Murphy, & Pierce, 1993; Katz & Murphy, 1992). Similar to the way in which steam power was replacing manpower in the Industrial Revolution and required new skills for operators, computers and artificial intelligence are replacing the cognitive capacities of workers, further increasing the demand for skills (Brynjolfsson & McAfee, 2014). The shift in labour demand and the separation of labour markets between skilled and unskilled workers creates inequalities between workers, and this also translates into sectoral differences between skill-intensive industries and low-skill industries.

In this paper, we argue, to the contrary, that the importance of labour market institutions should not be underestimated and demonstrate this relation for Belgium. Earlier research has shown that rents account for a large part of the inter-industry wage differentials in Belgium, but there are no trends over time (Du Caju, Rycx, & Tojerow, 2009). Our results confirm this finding arguing that collective wage bargaining leads to more equal wage developments across the wage distribution, and centralized wage bargaining leads to convergence of the growth rates of wages between sectors (Rycx, 2003). The consequence, in such regimes, is that low-paid work is costlier for employers and more attractive for workers, and high-paid work is less costly for employers, but investments in skills may be less attractive for workers. The compensating effects, however, lead to an unchanged wage bill, and the employment effect is limited or certainly not universally negative or positive (Vandekerckhove, Van Gyes, & Goos, 2018). In this paper, we will focus on the effect of collective bargaining on inter-sectoral wage growth differentials.

The structure of this paper is as follows: in section 1, we discuss the literature and theory on inequality. In section 2, the data are presented. Section 3 provides trend figures on inequality in Belgium. In section 4, the trends in collective bargaining are discussed. Section 5 establishes the empirical link between inequality and collective bargaining. Section 6 concludes the paper.

1 Theory on inequality

1.1 The relation between technology and skills demand

To illustrate the stages in the evolution of inequality and their relation to technological change, the literature has focused on the trends in the UK and the US since the 1980s. From that moment onwards, there is an increasing income inequality, with two distinct patters (Lemieux, 2008): between 1980 and 1995, the overall wage dispersion was increasing, which implied that the entire wage distribution widened (Autor, Katz, & Kearney, 2005; Beaudry & Green, 2005; Lemieux, 2006, 2008). From 1995 onwards, however, the upper-tail inequality was increasing (i.e. more inequality above the median pay level), while the lower-tail inequality (below median pay levels) decreased. A valid explanation of inequality should be able to fit with this changing pattern and explain the relative increase of low wages in the UK and the US.

The first consensus in the literature related the rising inequality to technological advances that benefitted high-skilled workers more (Acemoglu, 2002; Berman, Bound, & Griliches, 1994; Krueger, 1993). This hypothesis is known as 'Skill-Biased Technological Change' (abbreviated SBTC). The idea is that new technology, IT, augments the productivity of high-skilled workers, or is at least complementary to the skills

of these workers, and not of low-skilled workers. This leads to a demand shift and hence increasing income inequality. However, it is not clearly demonstrated that the advantage of some workers derives from their skills and training, or from the use of IT, and why not every IT-user enjoys the benefits of progress, and equally, why not all high-skilled workers see their wages increase.

This led to a second approach and consensus in the 1990s, which states that the nature of technological change is linked to task requirements. According to this approach, the labour market is organised through occupations that consist of tasks that can be routine (e.g. sorting, filing, accountancy), or non-routine (e.g. managing, cleaning) (routinisation-biased technological change). This hypothesis may explain the effect of IT, which excels in taking over routine tasks, for which the demand subsequently decreases, and fails in doing so for non-routine tasks, for which demand is unchanged (Autor, Levy, & Murnane, 2003).

The new consensus seems similar to SBTC: many high-skilled jobs, such as management, computer engineers, doctors, perform non-routine tasks, often assisted by IT. Hence both hypotheses predict an increase in jobs for high-skilled workers. However, a number of high-skilled jobs has become replaceable, and a fair share of low-skilled non-routine service jobs, are still in demand. For instance, robot vacuum cleaners can do a well-defined task, but fail to see (and clean) the dust on higher surfaces, which is an easy job for humans. Therefore, the hypothesis of 'job polarization', predicts a larger share of employment for both high- and low-paid, and high- and low-skilled jobs, but a decreasing share of middling occupations consisting of routine non-manual tasks. The findings for the UK and US (Autor, Katz, & Kearney, 2006; Autor et al., 2006; Goos & Manning, 2007) were subsequently demonstrated for other countries in the EU (Goos, Manning, & Salomons, 2009), although at the surface, different patterns of job growth exist (Fernandez-Macias, Hurley, & Storrie, 2012). Yet, the causes for these differences are not well known.

1.2 Limitations of the consensus models and new ideas

The two consensus models described above correspond with the trends in each of the two stages of inequality growth. The widening of the wage distribution before 1995 is consistent with the SBTC hypothesis. However, the stable inequality in the lower tail is not what one would expect if the demand for low-skilled, low-paid jobs would continue to drop as new technologies are introduced. The task-based approach then become more suitable as an explanation for the trend after 1995. Note that in this case, the decreasing lower tail wage inequality means that a large part of the job shifts goes towards lower paying job then toward higher paying jobs, so that the median wage decreases relative to the wages below this level. However, there is no reason to assume that the nature of technological change was different before and after 1995, leading to a lower demand for low-skilled workers at first and a higher demand next. Also, we find that the demand for higher skilled work had been growing, but now we find job losses and stagnating wages up to the 80th percentile (Autor, 2015). We should look therefore into other, complementary explanations.

One tentative explanation is the increased variable remuneration of managers (Piketty & Saez, 2006; Rosen, 1981). Research suggest that the challenges of complex firms that operate globally require better (i.e. more productive) managers, whose wage claims will be higher. Together with the increase in profits and the use of payment packages consisting of company shares, bonuses, and profit-sharing, about half of the rise in the income of managers can be explained (Gabaix & Landier, 2008). On the other hand, there is a lack of clarity about the residual, which may be linked to changing norms in the Anglosaxon world (Piketty & Saez, 2006). Another explanation might be the increased wage setting discretion of CEO's in companies with fragmented shareholders. However, it is hard to capture the variables that make up this residual. In addition, almost by definition, the wages of top managers cannot weight on the income distribution because of the low number of these positions (Kaplan & Rauh, 2010; Lemieux, MacLeod, & Parent, 2009). However, it is interesting to understand the dynamics at play when rents are distributed: rather than allocating the wages

according to the skills demands or productivity of workers, the position in negotiations and the formal process of distributing the wages might be crucial.

In that respect, minimum wages are found at the other side of the spectrum and are a more reasonable candidate for explaining wage inequality. In the context of income inequality in the US, it is a valid explanation for the rise in income inequality in the 1980s (DiNardo, Fortin, & Lemieux, 1996; Lee, 1999), and for the stability in the period after 1995. However, there is no consensus on the effect of minimum wage changes on employment (Neumark, Salas, & Wascher, 2014), nor on the measurement of this effect (Allegretto, Dube, Reich, & Zipperer, 2013). Most importantly, statutory minimum wages have no link to the kind of work that is performed, and the spill-over effects across the wage distribution tend to vary in different estimation. Following Autor, Manning & Smith (Autor, Manning, & Smith, 2014), we found that in Belgium spill-over effects to percentiles where the minimum wage is not binding are not due to disemployment, but rather that the effect is reversed below the median (Vandekerckhove, Goos, & Van Gyes, 2018). Above all, the cross-sectional effect of different sectors having different wage distributions and different pay levels, is dominant.

A promising approach to depart from the idea that wages are linked to individual skills or occupational skill requirements is the return of industrial dynamics (Goos, Rademakers, Salomons, & Vandeweyer, 2015), referring to Baumol's theory of cost disease as an explanation for rising low-skilled wages (Baumol, 1967; Baumol & Bowen, 1965). The logic is as follows: as technological advances create productivity gains in some (capital-intensive) industries, the relative wage cost in (less capital-intensive) industries without productivity increases rises for two reasons: first, the value of labour in productivity increasing industries is increasing, and second, there can be wage claims by the workers in the industries that are not growing. If the demand for labour of the employer in those sectors is inelastic, the threat of workers moving to industries with productivity increases causes wage rises. However, this implies at least a relative price change for the products or services, so unemployment should result unless the demand for the product or service is inelastic (Autor & Dorn, 2013).

The Baumol theory complements the literature on job polarization, and we are learning more about what drives the cost disease, but the mechanism through which this translates in equal or unequal growth depending on the country is not clear. In the elementary version, the upward pressure on wages come from the worker's mobility while it is known that, outside of the Nordic countries and the British Isles, job mobility and geographic mobility in Europe are not high. It is precisely because of this that employers may behave like monopsonists on the labour market, pushing wages and employment levels below equilibrium.

1.3 An institutional explanation for the different patterns of growth

The debate on minimum wages touches on an important aspect of wage inequality, but the scope should be widened for the purpose of this study. A number of studies have pointed at the correlation between unionization and income inequality, providing evidence of a negative correlation (Card, 1992; DiNardo et al., 1996; R. Freeman, 1993; R. B. Freeman & Katz, 1995). This explains the asymmetric inequality evolution since 1995: as union power in manufacturing industries decreases while the service sector is untouched and has low wage floors, higher mean wages, but more wage dispersion, the wage distribution shifts down towards the low-paid service jobs, decreasing lower tail income inequality, and increasing upper tail inequality, as the median has moved.

Acknowledging the effect of bargaining power and relying on Baumol's theory as well as on the observation that employment growth shows variations in patterns, other than job polarization, both across countries and over time, we argue that the institutional structure may be the mediating factor in all of these dynamics. The institutional structure relates to the centralization of collective bargaining (i.e. the level at which agreements are concluded), and the coordination (i.e. the linkage between agreements). Through multiemployer wage bargaining, firms decide to no longer compete based on wage cutting. Indeed, the crossprice elasticity of demand for a product between companies may be very high, but the demand for the good may be inelastic, as in the Baumol example above. If the social partners agree on this, they may collectively bargain higher wages for the workers, and have sufficient labour supply to maximize profits.

Historically, this is the model that was introduced in Europe in the period of reconstruction after the second world war. In Belgium, it has culminated in a legal framework for collective bargaining that was concluded half a century ago in the Law of 1968 (Vandekerckhove, 2018), defining the legal order of collective bargaining agreements reached at the national, sectoral, and company level, and entitling the National Labour Council and the Central Economic Council as the main governing bodies in this framework, besides the legal supervision and support by the Ministry of Labour. The main element in the Law of 1968 that underscores the importance of collective bargaining in Belgium is the mechanism of legal extension, whereby a collective bargaining agreement reached between the social partners in a sectoral joint committee applies to all workers and all companies in the sector.

The legal framework as it was outlined in the Law of 1968 put most weight of collective bargaining to the joint committees at the sectoral level. However, when Belgium joined the European Currency Area and pegged its exchange rate to a basket of European currencies in preparation of the Eurozone, excessive wage growth could no longer be offset by a currency devaluation in order to preserve competitiveness. The instrument for wage moderation that was introduced to replace this function is the margin for wage growth, or the 'Wage Norm', in the Law of 1996. This norm is based on the projections by the Central Economic Council of wage cost developments in the Germany, France, and the Netherlands, neighbouring countries with similar export structures, which are included in a gentlemen's agreement in an informal body for bipartite social dialogue ('Group of Ten'). However, if the social partners are unable to reach an agreement, the minister of labour may impose a legally binding Wage Norm. Therefore, the Law of 1996 effectively consolidated the centralisation of wage bargaining in Belgium, as the Wage Norm is a single upper margin for wage developments, and therefore the ceiling imposed on sectoral collective bargaining agreements. In 2015, a revision of the law further strengthened the legal imperative of the norm.

2 Description of the data

We use administrative data provided by the National Social Security Office (NSSO). The total sample includes 20% of all employees in Belgium between 1996 and 2015, registered on a quarterly basis. The sampling algorithm ensures that the panel structure of the data is maintained while also being cross-sectionally representative: all workers have a single chance (of 1 in 5) to be selected for the panel, in the last quarter they appear in the population. In practice, therefore, a random sample of 20% of the population (excluding students and apprentices) is drawn in the final quarter of the final year (2015), and then every worker that has been selected is traced back up to the first year (1996). For all new workers in the third quarter of 2015, i.e. the workers leaving employment in the next quarter, another selection of 20% is made, and so on. The data were compared to the Structure of Earnings Survey data for Belgium to verify their representativeness.

The data encompass wages and working time, including the basic quarterly wage, the daily wage rate, bonuses, payments for waiting time, severance payments for dismissals, the percentage part-time work, the relative working volume excluding and including equivalent days (illness, pregnancy, military duty), and the number of paid working days. The basic wage for blue-collar workers does not include the holiday allowance of around 8% of the annual wage, as it does for white-collar workers. Hence, the holiday allowance had to be estimated based on the distribution of equivalent days over the four quarters. Although this procedure

smooths out wage evolutions at the aggregate level, there is additional error on the wage variable, which concentrates in the third quarter when blue collar worker register fewer working hours due to the take up of holiday leave. Other information on the employee and the employer includes: gender, birth year, statute (blue collar, white collar, civil servant), residence (district level), sector (three digit NACE 88 up to 2007 and NACE 08 from 2008 onwards), joint commission (2003 onwards), company seat (district level) and site location (district level), company id, social fund id, and company size. Because the identifier for the joint committee was not a mandatory field in the social security registration until 2003, we used information on sector, social fund, and the worker statute, as well as future information on the employer, to determine the joint commission before this year. The employment evolutions shown in the appendix show that this approach was successful.

Sectoral minimum wages are obtained from own "Belgian minimum wage" database, which combines different sources with information on the wage settlements: Baremawijzer, a tool from an HR service provider; the ICL index of conventional wages from the Ministry of Labour, and minimumlonen.be, the minimum wage database of the ministry of labour). The database includes 44 of the largest joint committees from 2000 onwards, covering 70% of employment in the private sector. It holds information on 1370 wage changes, of which 77% includes wage indexations, 23% includes real wage increases, 15% are real wages increases, and 85% are percentage wage changes. For the period from 1996 to 1999, the times series are extended using the ICL index of collectively agreed wage changes that is provided by the Ministry of Labour. To build a longitudinal index of collectively agreed sectoral minimum wage floors, the same job category had to be traced over time. As European legislation on labour market discrimination, implemented in national legislation in 2007 and effective from 2009, requires seniority wages to be based on competence or tenure and not on age (OECD, 2013), there have been changes in the wage scales in all joint committees affected by the law. In many cases, the minimum wage was defined at 21 years, and younger workers received a percentage of this minimum wage, which was then unlevelled after the change. Although this is interesting variation, the uplevelling is more likely to match the age profile of entrants, so the minimum wage in our database is always measured at age 21 in such sectors.

For computational and statistical reasons, a subset of 4% of the total population is from the sample and, for most purposes, only the main job in a quarter is considered. Around 3% of workers holds more than one jobs in a quarter, but this includes workers that transition between two jobs, and the number is constant. Because minimum wages are not applicable to the public sector, only the private-sector workforce falls within the scope of this study. Also, as temporary agency workers are subjected to the same minimum wages as regular workers in the sectors where they are employed, but as there is no registration of this link, temporary agency workers are not included here. Furthermore, for most analyses, the sample is restricted to the joint committees for which minimum wage information is available. Four sectors had to be excluded because of breaks in the time series: nos. 152, 200, 227, 327 (see annex here as well as more detailed time series in Vandekerckhove, Van Gyes, et al., 2018).

Finally, the subsample selects workers between 21 and 64 years old, excluding teenagers for whom many apprentice statutes exist, affecting the social security administration, and whose minimum wage rates have been adjusted separately from other minimum wages. For instance, in 2015 the national minimum wage for all workers over 18 years old became 100% of the national minimum wage, but most sectors had already equalized minimum wages within the sector in anticipation of this change. Moreover, the relationship between minimum wages and employment for young workers is a topic that is often discussed separately from overall employment effects (Dolado et al., 1996). Finally, because the age of leaving formal education is on average 21.5 years of age and 45% of the age group between 20 and 24 is in education (Eurostat figures for 2009), including the youngest employees would change the sectoral distribution of the sample.

This brings the total number of data point to 7 507 071. The panel size includes 433 995 workers, meaning that the one worker remains on average for 17 quarters in the sample. The minimum sample size is 83 100

in the first quarter of 1996, and the maximum is 101 136 workers in the third quarter of 2012, reflecting an annual average growth of the workforce by 1.2%. as well as the enlargement of the population of civil servants covered by the NSSO.

3 Trends in inequality

3.1 Long-run trends in inequality

While after 1995 inequality in the upper tail has increased in most countries, Figure 1 (right panel) shows no trend of a drop in the p50/p90 ratio, which for full-time equivalent wages is steady around 60%, and for effective wages is around 55%. In the lower tail, we do see that the gap between effective and full-time wages is large in the upper tail, meaning that workers at p10 have fewer working hours than workers at p50, but this difference is also stable over time. The slight drop visible in 2003 is an artefact that results from changing administrative procedures, which measured shorter work periods. The trends in Figure 1 represent the evolution of basic wages (salaries, including task-based compensations and variable payments). The evolution of total remuneration including bonuses (Figure 2) follows a similar steady path, interrupted by rising lower-tail inequality (a drop in the ratio) in the fourth quarter due to differences in end-of-year bonuses which workers at p10 and p20 do not commonly receive. Interestingly, in the third quarter the upper tail is more compressed.



Figure 1. Wage inequality in Belgium between 1996 and 2016

Source: National Social Security Office



Figure 2. Inequality in total remuneration in Belgium between 1996 and 2016

Source: National Social Security Office

As inequality in the tails is not changing, overall inequality if also stable. However, to test for polarization in the wage distribution, we also show the p40/p60 ratio. In case there would be a downward pressure on wages for middling occupations, the wage distribution should become flatter in the part with the highest density, and while the quintile and decile ratio may be unchanged, the p40/p60 ratio should drop because of the widening gap between the percentiles. Yet, as with overall inequality, we do not observe changes in the middle of the wage distribution, regardless of whether one takes into account wage rates (FTE wages) or labour revenue (wage sum), which includes changes in working hours.

3.2 Inequality within and between sectors

Figure 3 shows the average evolution of decile and quintile ratios in the 40 selected joint committees over time in levels (left-hand graph) and expressed as percentage point changes relative to the year 2000 (right-hand graph). A decrease in the ratio implies an increase in inequality. As above, the general trend is stable. However, if we zoom in on the percentage point difference with 2000, some variation appears. Section 0 in the appendix shows all underlying trends by joint committee, grouped by effect-size of the time trend. We mainly see movement in the upper tail, but there is an equal number of sectors where the upper tail is compressed, and where it expands. In the right-hand panel of the figure below, we see minimal changes within the range of +/-1%, with a decrease in inequality, until 2006, except in the lower tail. After 2006, there is a sudden rise in inequality (a drop in the graph) in 2007 and 2008, which were economically prosperous years, followed by a decrease in 2009, when the recession started, which put pressure on high wages and caused dismissals among low-wage workers. From 2010 onwards, inequality rates increase slightly in the upper tail, leading to a decrease in those quantile ratios relative to of around half a percent in 2015.



Figure 3. Inequality in total remuneration in Belgium between 1996 and 2015

The aggregate inequality in the population combines trends within sectors and between sectors. Figure 4 shows the evolution of the variance between sectors of the median and mean wages at a quarterly basis between the first quarter of 1997 until the fourth quarter of 2015. In nominal terms, the deviation is stable, but this should be corrected, as the variation automatically increases with the scale of wages, c.q. with inflation. When adjusting the wage levels to the 2005 base level using the Consumer Price Index, the variance in both real mean and median wages between joint committees is decreasing, converging to almost half its size in 2015 compared to 1997. This shows that behind the overall stability, there are mechanisms that balance inequality between and within sectors. In the next sections, we will first discuss institutional trends that may be the cause for this convergence and stability, and then empirically link these trends to wage developments.

Source: National Social Security Office



Figure 4. Inequality in total remuneration in Belgium between 1998 and 2015

Source: National Social Security Office

4 Trends in collective bargaining

4.1 Evolution of negotiated pay

Negotiations for the interprofessional agreements that set outs the wage norm take place in every even year, and the bargaining at the sector level consecutively takes place in both odd and even years. Figure 5 shows the wage norms for ten two-year bargaining rounds from 1997-98 to 2015-16, the cumulated change in the sectoral wage settlements in each period, and the evolution of the health index¹. The figure shows that the price level gradually takes up a larger share of the nominal wage norm, and that the real wage norm accordingly shrinks, despite an annual inflation rate that is on average below the 2% ECB target. This is related to the change in the definition of the wage norm, which until 2009 was an 'all-in', non-binding agreement, leaving larger margins to sectors and companies. Economic growth and inflation in 2007-2008, however, caused the real wage norm to be negative, because the nominal wage norm was underestimated. Yet, sectors at least followed the indexation of wages. From 2009 onwards, increasing political pressure in response to the recession moderated the wage claims, and the agreements of 2011-12, 2013-14, and 2015-16 were legally enforced by the government. In practice, this has meant an almost complete bargaining centralization (Van Gyes, Van Herreweghe, Smits, & Vandekerckhove, 2018; Vandekerckhove & Van Gyes, 2017). Moreover, these interprofessional agreements exclude wage indexation, and only define the real margin. A revision of the Law of 1996 in 2015 further consolidates this tighter framework and reduces the margins for negotiation.

¹ The health index is a moving average of the consumer price index, excluding alcohol, tobacco, and motor fuels from the basket of goods. The health index was introduced in 1991 in anticipation on the ECU and the Maastricht criteria. The idea was to prevent second round effects from imported 'bad' inflation, such as oil price shocks, as there would be no possibility, in a currency union, to devaluate the currency when wages worsen the competitive position of the economy.



Figure 5. The wage norm, negotiated pay levels, and the health index over ten bargaining rounds (1997-98 to 2015-16)

Source: Ministry of Labour, Statbel

4.2 Evolution of negotiated pay within joint committees

We use the evolution of minimum wages from our database as a measure of collectively agreed wage changes, and contrast this with the wages norms in the nine completed bargaining rounds (TPA' or interprofessional agreements). Figure 6 illustrates the structure of wage setting: the wage norm (log nominal IPA in the graphs) is set for a two-year period, and through sectoral wage changes, this norm is gradually reached. The difference that remains between the wage norm and the sectoral agreements is the margin that can be used to settle company agreements or for individual agreements.

The pattern of reaching the wage norm varies by sector. In the example of the construction sector (no. 124), there are constant increases in the sectoral minimum wage, and in most bargaining periods, the wage norm is fully implemented. Figure 16 in appendix shows the trends for selected joint committees. The adjustment speed and frequency are impacted by the indexation of wages. For example, one system of wage indexation adjusts wages to the cost of living periodically with constant time intervals (monthly, twice a year, yearly), while another system adjusts wages only when the prices are inflated by 2% (the so-called pivot index). As the interprofessional agreements up to 2009 were all-in agreements, some caution to conclude real wage norm has been progressively reduced as part of the austerity politics. Only in the bargaining period 2011-12, the nominal wage norm was significantly higher, but as Figure 5 has shown, the real norm was also low and the nominal increase is linked to inflation during the economic recovery.

Figure 7 shows the cumulated difference between the wage norms and the sectoral minimum wages by year, and in the last quarter of the final year of the bargaining round. This is effectively the area between the bars in Figure 6. One can readily see that the total wage bill would be significantly different if the sectoral agreements implemented the full interprofessional wage norm immediately in the beginning of the bargaining round, versus only in the last quarter. In most interprofessional agreements, the timing of the allowed sectoral wage settlements is not strictly described. In the graphs, we see that the margins decreased over time to even become negative in 2008, because inflation was higher than anticipated. In 2009-10, there

was again some margin, which subsequently lowered again in 2011-12 and 2013-14. The right-hand panel of the figure shows to what extent the sectors had different margins over time. The standard deviation of the margins at a yearly basis or at the end of the bargaining period varies without a clear trend, although economic booms such as in the early 2000s and in 2008 go together with more variation between sectors. In recent years, the variation in negotiated pay growth in wage settlements is on average less than one percent. Naturally, this is closely linked to the low level of the wage norm. In the following section, we will look into the consequences this has for effective wage growth.







Source: Ministry of Labour, Acerta





Source: Ministry of Labour, Acerta

5 The relation between collectively agreed wage increases and wage convergence

5.1 Growth across the wage distribution

Growing wage inequality or polarization of wages implies that not every part of the wage distribution witnesses wage increases of the same size over time. In contrast, the stability of wage inequality in Belgium should imply that wages evolve in the same way across the wage distribution. Figure 8 plots the evolution of the wages in the 20th percentile (left) and the 80th percentile (left) of each of the 40 selected sectors. We

can see exactly the same pattern in wage changes (not shown). Moreover, towards 2015 wages are in a depression, which can be linked to the combination of a low wage norm and little variation in the margin between joint committees, suggesting that the coordinated sectoral wage increase is the wage norm, which was effectively 0% in 2013-14.

Figure 9 summarizes the evolutions of all five deciles (p10, p20, p50, p80, p90) to show that, indeed, their movement is perfectly synchronous, and follows a downward trend between 2000 and 2015, which may be due to the economic environment, but also to the institutional response to this environment. In the right-hand graph, the standard deviation for each decile over all selected sectors is shown. The average deviation is around 2%, except for the 90th percentile that appears to have greater variation.

Figure 8. Annual growth for the 20th percentile (left) and the 80th percentile (right) in selected sectors (1997Q1-2015Q4)



Source: National Social Security Office

Figure 9. Annual growth of different quantiles: mean (left) and standard deviation (right) of selected sectors (1997-2015)



Source: National Social Security Office

5.2 Median growth figures

The evolution of effective wages at given quantiles discussed above relates to the wage settlements, but the quantile figures are also a result of changes in the composition of the workforce (for instance, inflow of lower paid migrant workers or upskilling of the labour supply due to demographic changes and higher educational attainments). A closer figure to match the wage agreements should be the median wage *growth*, not the growth of the median wage.

To find this growth rate, we start by calculating the yearly growth of individual workers' wages. However, due to the system of seniority increases in white-collar sectors, those employees have automatic wage increases. Therefore, we estimate the seniority increase by sector using the following equation:

$$\ln W_{it} = \beta_0 + \beta_1 A_{it} + \beta_2 B_i + \beta_3 W_i^o + \beta_4 \left(\frac{W_i^z}{W_i^o}\right)^{\frac{1}{z-o}} + \ddot{Q} + \varepsilon_{it}$$

Where $\ln W_{it}$ is the log wage of worker *i* at time *t*, *A* is the age, *B* is the year of birth, W^o is the workers' (de-trended) starting wage, $\left(\frac{W_i^2}{W_i^o}\right)^{\frac{1}{2-o}}$ is the average de-trended wage growth throughout the workers' careers, and \ddot{Q} are quarterly time dummies. The reason to include the workers wage progression and starting wage is to filter out wage increases due to ability, and only estimate the automatic increases by age, hence β_1 is the seniority wage increase. Besides running the regression by sector, we only estimate the wages of workers between the ages of 21 and 50, as wage scales stop increasing after 20 to 25 years. This technique has worked well in estimating the rate of seniority increases, as we find an average of 0% for blue-collar workers, an average of 1.4% for white-collar workers, and an average of 0.7% in mixed joint committees, as expected and reported by other sources as well. We can, therefore, subtract the sectoral wage increase from the wage increase form the wage increases of individual workers.

Figure 10 shows the results of this exercise, with the quarterly median growth in the left-hand graph, and the end-of-IPA median growth on the right-hand side. As the latter relates to two-year changes, the rates are naturally higher. We see the same pattern as in Figure 8 and Figure 9, but the median wage increase minus seniority wage increases is always lower, and indeed gravitating towards zero in the last bargaining round. However, if we compare the effective wage evolution with the wage norm (right graph), we find the sectors scattered around the wage norm, including some positive 'wage drift'.

Figure 10. median wage growth and median wage growth corrected for seniority in selected sectors (1997-2015): quarterly figures (left) and end-of-IPA figures with wage norm (right)



Source: National Social Security Office

5.3 The relation between effective wages and collectively agreed wages

The discussion above has already visually linked effective wage evolutions to collectively agreed wages and the wage norm. To quantify this effect, we estimate the 'between changes' in both using a first difference OLS regression. In the first model, we regress three wage concepts (median growth, median growth without seniority, and the growth of the median) on the wage norm at the end of the bargaining round. In the second model, we regress the wage concepts on the wages in the sectoral collective bargaining agreement. Table 1 reports the results, showing almost identical coefficients that demonstrate the strong relation between effective wages and wage agreements and even framework agreements such as the wage norm in Belgium. In both models, the model with the best fit result is the median growth without seniority.

	Median growth	Median growth w/o seniority	Growth of median	Median growth	Median growth w/o seniority	Growth of median
IPA	0.395***	0.396***	0.416***			
CBA				0.640***	0.639***	0.615***
Intercept	0.012***	0.005	0.005	0.015***	0.007***	0.011***
Ν	333	333	333	2809	2809	2809
r2_a	0.132	0.140	0.075	0.387	0.422	0.214

Table 1. Regression of wage growth on the wage norm in the IPA and the wage floor evolution in the sectoral CBAs

Note: * p<0.05; ** p<0.01; *** p<0.001

The last step of the analysis is to link the margin between the wage norm and collective bargaining agreements to the variation in wage growth. If smaller margins lead to less variation in collective wage settlements, we should also see this effect in the effective wages. To test for this, we compute the absolute value of the difference of the median growth without seniority and the median of this wage concept over all sectors. We then regress this on the end-of-year margin. Table 2 shows that there is indeed a significant positive effect of larger margins between the wage norm and the collective bargaining agreements, and the spread of wage increases, or conversely, as the margin decreases, wages converge. Finally, the relation is plotted in Figure 11, confirming also that there is no particular clustering by year, as in the regression output.

Table 2. OLS regression of the absolute deviation from the median wage chang in selected sectors on the margin between the wage norm and the sectoral wage floor growth at the end of the IPA bargaining round in selected sectors

	β
Margin IPA-CBA	0.137***
Year (ref: 1998)	
2000	0
2002	0.003
2004	0
2006	-0.001
2008	0.006**
2010	0
2012	0
2014	0
Intercept	0.009***
Ν	333
R_{adj}^2	0.059

Figure 11. End-of-IPA margin and absolution deviations from the median wage change in selected sectors



6 Conclusions

Wage inequality is a growing concern in the western industrialized world. It may lead to a dualized labour market and precariousness or poverty. However, it may also be an unavoidable economic reality of the future, caused by disruptive trends such as increased globalization, migration, and technological change. Indeed, those drivers are generally the ones to be brought up in the political and academic debate. In contrast, the role of industrial relations systems is often overlooked. Nevertheless, looking at the evolution of inequality in Belgium, it appears that there the corporatist institutions have, until now, managed to contain inequality, despite increased industrial diversification and a number of severe challenges on the way.

The literature does suggest reasons why sectors with fewer productivity increases may also face higher wage claims and be able to cling on to productivity growth in other sectors. However, the effect of wage coordination and centralization can take the place of those explanations. While the Belgian institutional system traditionally puts most weight on collective bargaining at the sectoral level, there is an increasing tendency to enforce national framework agreements (the so-called 'wage norm'). This is paramount to centralizing wage coordination and imposing a strict coordination of wage evolutions.

We have shown that this is indeed what has happened in the last two decades. Wage inequality in Belgium is, in contrast to other countries, stable and wage evolutions are similar across the wage distribution. Sectoral variation is reduced and there is even real convergence between sectors. As the margins for negotiations at the company level and at the individual level become tighter, this trend is expected to continue and to further reduce the inter-sectoral wage differentials.

These findings are important in light of the challenges ahead: there is an implicit trade-off between equality fostered on the market through negotiations, and equality that is fostered by the state through redistribution. To anticipate on the growth of the low-wage service jobs, for instance, a system of service vouchers was introduced in Belgium, where the wage is complemented by benefits received from the state in order to maintain the demand for the service. However, if the demand is not very elastic, a more efficient solution might be to include these low-level service jobs in the collective bargaining structure and to not let them

compete on wages. Of course, this requires administrative controls and the means to combat the grey economy.

This study has highlighted the stability of wage inequality and the strong link between wage setting and effective wages. However, the analysis is based on variation in the wages and wage distribution of sectors, without controls. Future research can add worker information on skills and firm-level information on productivity and capital intensity, in order to better isolate the effect of the bargaining structure, and to reveal latent and perhaps suppressed trends driven by demand and supply factors and technological change.

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7 Appendix

7.1 Data cleaning

Table 3. Joint committees in the analysis

		Variance	Inequality	Negotiated pay	Effective wage	Regressions
		(3.2)	(3)	(4)	(5)	(5.3)
104	Iron	х	х	х	Х	х
105	Non-ferro	х	х	х	Х	х
106	Concrete	х	х	х	Х	х
109	Clothing	х	х	х	Х	х
110	Textile care	х	х	х	Х	х
112	Garages	х	x	х	Х	х
114	Stone	х	x	/	Х	х
115	Glass	х	х	х	Х	х
116	Chemistry	х	х	х	Х	х
118	Food	х	х	х	Х	х
119	Food trade	х	x	х	Х	х
120	Textile	х	х	х	Х	х
121	Cleaning	х	x	х	Х	х
124	Construction	х	х	х	Х	х
126	Woodworking	х	х	х	Х	х
130	Print	х	х	х	Х	х
136	Paper processing	x	х	х	х	х
140	Transport	х	х	x	х	x

		Variance	Inequality	Negotiated pay	Effective wage	Regressions
		(3.2)	(3)	(4)	(5)	(5.3)
145	Horticulture	х	х	х	Х	Х
149	Metal related	х	х	х	х	х
152	Private education	0	0	0	0	0
200	Mixed white collar	x	0	0	0	0
201	Independent retail	х	х	х	х	х
202	Food retail	x	х	х	х	0
207	Chemistry	x	х	x	х	х
209	Metal	x	х	x	х	х
211	Petrol	x	х	x	0	0
214	Textile	x	х	x	х	х
215	Clothing	x	х	x	х	х
218	Mixed white collar	x	х	x	х	х
220	Food	x	х	x	х	х
227	Media	Х	0	0	0	0
302	Accommodation	х	х	х	х	х
306	Insurances	х	х	х	х	х
307	Insurance brokers	х	х	х	х	х
308	Savings banks	х	х	х	х	х
310	Banks	x	х	x	х	х
311	Large retailers	x	х	x	х	х
312	Department stores	х	х	х	х	х
313	Pharmacies	х	х	х	х	х
319	Educational institutions	Х	х	Х	x	х
321	Whosale of drugs	х	х	x	х	х
327	Sheltered workshops	0	0	Ο	0	Ο
329	Social and cultural work	х	x	x	0	Ο
	Number of sectors	42	40	39	38	37

	Variance	Inequality	Negotiated pay	Effective wage	Regressions
	(3.2)	(3)	(4)	(5)	(5.3)
1996	х	х	0	0	0
1997	х	х	х	x	х
1998	х	х	х	x	x
1999	х	х	х	x	x
2000	х	х	х	x	х
2001	х	х	x	x	х
2002	х	х	х	x	х
2003	х	х	x	х	х
2004	х	х	x	х	х
2005	х	х	x	х	х
2006	х	х	x	x	х
2007	х	х	x	х	х
2008	х	х	х	x	х
2009	х	х	х	x	х
2010	х	х	х	x	х
2011	х	х	х	x	х
2012	х	х	х	x	x
2013	х	х	х	x	x
2014	х	х	х	x	x
2015	х	х	х	x	х
Number of years	20	20	19	19	19

Table 4. Years included in the analysis

7.2 Evolution of wage inequality by joint committee



Figure 12. Overall wage inequality by trend quartile: p10-p90

Figure 13. Overall wage inequality by trend quartile: p20-p80







Figure 15. Upper-tail wage inequality by trend quartile: p50-p90



Figure 16. Minimum wage evolution (logs) within IPA bargaining rounds, by joint committee (1997-98 to 2015)





















































































