Job Polarisation and Wage Inequality in Portugal

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(preliminary version)

Wages and earnings in the private sector

Table 3 Median real hourly wage (euros)

	2005	2012	Annual growth rate (%)
Total	4.85	4.99	0.41%
Age <30 years	4.31	4.77	1.46%
30<= age <45	5.16	5.16	0.00%
Age >=45	5.18	5.01	–0.48%
Non-tertiary education	4.53	4.67	0.44%
Tertiary education	10.81	11.87	1.35%
Male	5.45	5.60	0.39%
Female	4.21	4.35	0.47%

Source: QP dataset (Figueiredo *et al*. 2015).

Expanding the analysis to all workers in both years we can see that substantial flows of workers did occur over the period (Table 4). A reduction of total employment in the Portuguese private sector (305,159 fewer employees in 2012 compared with 2005) is the outcome of three diverse situations: workers who remained employed (2005 and 2012), workers who were not employed in 2005 but were in 2012 (inflow) and workers who were employed in 2005 but not in 2012 (outflow). Three main changes deserve to be stressed: (i) the strong reduction of employment among young people; (ii) the heavy concentration of job destruction on men's jobs; and (iii) the noticeable increase in employment of highly qualified workers. As regards the impact of these changes in wages the most noticeable aspect is that the evolution of the median wage between 2005 and 2012 became negative for the highly educated, meaning that the increase reported in Table 4 applies only to highly educated *insiders*. For highly qualified newcomers, wages are lower than they were for those who entered the labour market in 2005 or earlier. In a related analysis using the same dataset, Figueiredo et al. (2015) also show that inter-decile wage mobility also decreased from 2005 to 2012, particularly for the middle-wage groups adding further evidence to a diagnostic of relative lethargy in the Portuguese labour market affecting both the relative situation of the young and the upward mobility of the middle classes.

Table 4: Stocks and flows of employment in Portugal (private sector)

	2005	2012	2005 and 2012	Flows 2005–2012		
				flow in	flow out	net flow
Total	2,596,231	2,291,072	1,374,057	917,015	1,222,174	–305,159
Age Groups						
Age <30 years	742,444	463,813	420,786	43,027	321,658	–278,631
30<= age <45	1,153,470	1,080,011	685,171	394,840	468,299	–73,459
Age >=45	700,317	745,082	268,100	476,982	432,217	44,765
Education						
Non tertiary education	2,299,827	1,890,366	1,202,016	688,350	1,097,811	–409,461
Tertiary education	296,404	400,706	172,041	228,665	124,363	104,302
Gender						
Male	1,469,232	1,212,014	758,889	453,125	710,343	–257,218
Female	1,126,999	1,079,058	615,168	463,890	511,831	–47,941

Source: QP dataset (Figueiredo *et al*. 2015).

QUADROS ELABORADOS COM OS QP MAS QUE NÃO FICARAM NA VERSÃO FINAL DO PAPER

Table 5: Stocks and flows of employment in Portugal (private sector)

	2005	2012	2005 and 2012	Flows 2005-2012		
				flow in	flow out	net flow
Total	2.596.231	2.291.072	1.374.057	917.015	1.222.174	-305.159
Age Groups						
Age <30anos	742.444	463.813	420.786	43.027	321.658	-278.631
30<= age <45	1.153.470	1.080.011	685.171	394.840	468.299	-73.459
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Gender						
Male	1.469.232	1.212.014	758.889	453.125	710.343	-257.218
Female	1.126.999	1.079.058	615.168	463.890	511.831	-47.941

Source: QP dataset (Figueiredo *et al.* 2015).

Table 6: Mobility matrix of Portuguese workers by wage group, 2005-2012

		2012					Total	workers	share
		<60%	60%-80%	80%-120%	120%-200%	>200%			
2005	<60%	21,8	47,1	23,1	6,4	1,6	100,0	77957	**5.7%**
	60%-80%	4,5	55,6	31,4	6,8	1,7	100,0	300639	**21.9%**
	80%-120%	1,4	16,9	60,9	17,3	3,5	100,0	428894	**31.2%**
	120%-200%	0,7	5,1	25,1	53,8	15,3	100,0	308639	**22.5%**
	>200%	0,3	1,8	5,1	15,4	77,4	100,0	257928	**18.8%**
Total		2,8	21,6	33,8	22,2	19,5	100,0	1374057	**100.0**

Source: QP dataset (Figueiredo *et al.* 2015).

Table 7: Mobility matrix of Portuguese workers by wage group, 2005-2009

2005		**2009**					Total	workers	%
		<60%	60%-80%	80%-120%	120%-200%	>200%			
2005	<60%	34.0	41.8	17.2	5.3	1.7	100.0	106231	**6.1%**
	60%-80%	6.0	60.3	25.7	6.4	1.7	100.0	387944	**22.3%**
	80%-120%	1.3	15.7	63.5	16.0	3.5	100.0	546893	**31.4%**
	120%-200%	0.6	4.1	21.5	58.6	15.3	100.0	382134	**21.9%**
	>200%	0.3	1.3	3.9	12.8	81.6	100.0	317921	**18.3%**
	Total	**4.0**	**22.0**	**32.2**	**22.0**	**19.8**	**100.0**	**1741123**	**100.0%**

Source: QP dataset (Figueiredo *et al*. 2015).

Table 8: Mobility matrix of Portuguese workers by wage group, 2009-2012

2009		**2012**					Total	workers	%
		<60%	60%-80%	80%-120%	120%-200%	>200%			
2009	<60%	38.5	43.9	13.3	3.5	0.9	100.0	74528	**4.3%**
	60%-80%	4.4	65.8	24.9	4.0	0.9	100.0	390441	**22.7%**
	80%-120%	1.1	13.4	70.4	13.1	2.0	100.0	550529	**32.0%**
	120%-200%	0.5	4.2	19.8	64.4	11.2	100.0	379123	**22.1%**
	>200%	0.2	1.3	4.0	13.8	80.6	100.0	324395	**18.9%**
	Total	**3.2**	**22.3**	**33.9**	**22.1**	**18.6**	**100.0**	**1719016**	**100.0%**

Source: QP dataset (Figueiredo *et al*. 2015).

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5. Case studies

We conducted two case studies to highlight particular dimensions of the Portuguese labour market, aimed at establishing a closer link between changes in the labour market situation and the income distribution. Case study 1 discusses job polarization, while case study 2 highlights some issues related to public employment.

Case study 1: the structural transformation of employment and the middle classes: polarization or upgrading?

The possible polarization or hollowing-out of the labour markets of the most developed economies (Autor *et al.*, 2008; Autor and Dorn, 2013) is crucial to understanding the relative position of middle-income groups. If jobs at the bottom and the top of the wage and skill distributions grow at the expense of medium-skilled occupations, one may expect middle-income groups to be disproportionally affected because their employment- and earnings-related components of income, in particular, could be significantly reduced (in relative terms) through the effect of employers' reduced demand for their traditional jobs and skills. To date, however, the evidence on this polarization hypothesis is somewhat contradictory. Goos *et al.* (2014), for example, show that between 1993 and 2010, both high-paying managerial, professional and associate professional jobs, as well as low-paying service and elementary jobs increased their employment share in Portugal at the expense of middle-level clerical, craft-related and industrial (machine operators and assemblers) jobs. Fernández-Macias (2012) argues, however, that the pervasiveness of job polarization in Europe – as documented by those authors – is strongly dependent on the consideration of a common ranking of jobs (both by skill and wages) across countries and disregards differences in the relative importance (employment share or even average skill levels) of specific occupations in different economies. Using instead national-level job rankings as well as wage and skill quintile measures, the author finds that the dynamics of the specific occupations used by Goos *et al.* can hide, in specific economies, significant structural upgrading. The author shows that this is the case for Portugal where, from 1995 to 2007, there was a very strong destruction of low-paid (first wage quintile) jobs and a stronger creation of highly-skilled (fifth skill quintile) jobs. The authors' results further show that, when jobs are ranked according to their initial wage level, it appears to have been middling jobs (third and fourth quintiles) that experienced the strongest growth during this period.

This tension between polarization and upgrading is, we believe, important for understanding the way in which recent changes in the structure of the Portuguese labour market can impact the relative position of middle-income groups and why one may expect that the existence of such polarization dynamics may not necessarily result in a very visible deterioration of their relative position.

In this section and following Figueiredo *et al. (*2015), we look at changes in the composition of private-sector jobs in 1995–2009, ranked according to their initial skill and wage levels. We again use the *Quadros de Pessoal* dataset which collects the staff logs of practically all private-sector firms with at least one employee. Jobs are here defined as specific 4-digit CNP (ISCO-88) occupations. The period 1995 to 2009 is the longest available for which there are no breaks in the occupational classification available in this dataset. The non-inclusion of public sector workers is an important limitation if we take into account the importance of this sector among highly-skilled workers. We do, however, refer to the relative position of public sector versus private sector workers in the following section.[1]

We start by looking at the change in the employment share of specific jobs (in percentage points) ranked both by initial mean (median) hourly wage and skill (share of university graduates) levels. Figures 25 and 26 provide an initial visualization of the transformation of the Portuguese private-sector labour market over this period, with the area of each bubble referring to the share of employment of each occupation in 1995.
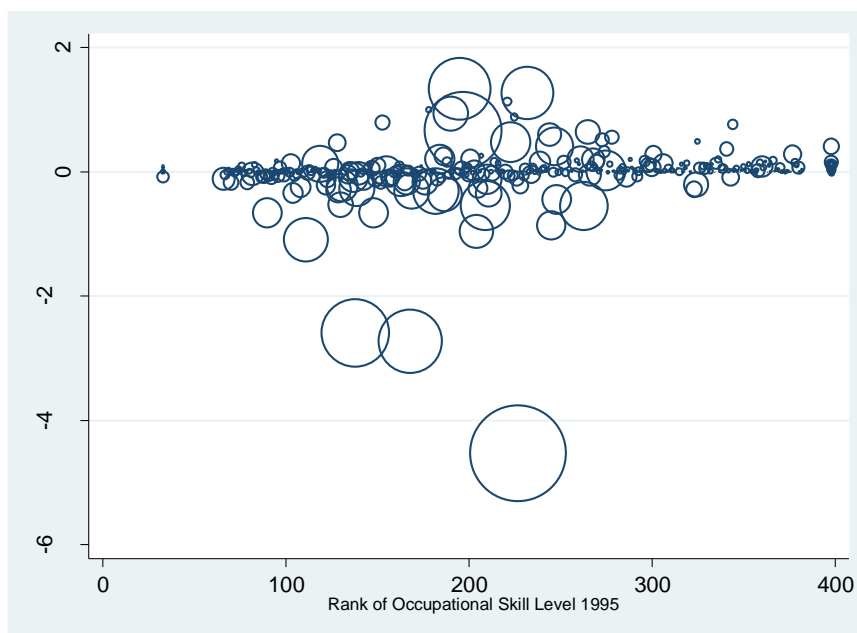
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[1] Goos *et al.* (2014) findings for Portugal are, however, calculated using ECHP and EU-SILC data which include public sector workers.

Figure 25 Change (1995–2009) in employment share of occupations ranked by initial (1995) hourly wage
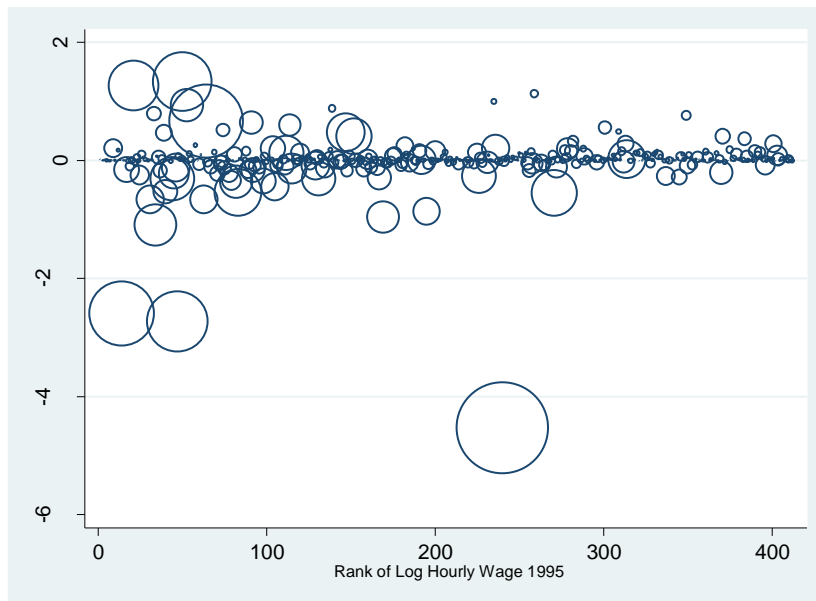
Source: QP dataset (Figueiredo *et al.* 2015).

Figure 26 Change (1995–2009) in employment share of occupations ranked by initial (1995) skill level

Source: QP dataset (Figueiredo *et al*. 2015).

First, these figures show that a relatively small number of occupations have the potential to account for a relatively large share of employment in 1995. Changes in the representativeness of these jobs in employment over this period can then help us to understand a large part of the overall story of polarization or upgrading over this period. Second, they also make it clear that private-sector employees were overly clustered in low-wage and low/middle-skilled occupations in 1995. Third, they do not display a very clear pattern of polarization. When jobs are ranked according to their initial earnings level, for example, there are both sizeable downward and upward shifts in the employment share of important low-paid jobs. Similarly, when ranking jobs by their initial skill level, we can spot both large decreases and increases in the employment share of significant middle-skilled occupations, as well of a number of relevant low-skilled occupations.

In order to add detail to this story, Tables 5 and 6 provide a list of the top 10 and bottom 10 jobs when these are ranked by changes in their employment share over this period. These 20 jobs accounted for slightly more than 40 per cent of overall employment in 2009. In addition, Table 7 lists similar details about the ten biggest jobs (in terms of employment share) in 2009, which accounted for 35 per cent of overall employment. In addition to the information on changes in their employment share, these three tables also provide details about the skill intensity of these occupations (measured by the share of university educated individuals among these workers), their median hourly wage levels in 2009, as well as how they compare with other jobs in terms of the age structure of their workforces.

Table 5: List of top ten fastest increasing jobs (in employment share), 1995–2009

	Job		Change in Emp Share (pp)	Employment Share 09	Median Hourly Wage 09	Share of Graduates	Age Ratio 95	Age Ratio 09
1	9132	Helpers and Cleaners (Offices, Hotels, …)	1.34	0.06	3.23	0.02	1.11	1.14
2	5123	Waiters	1.27	0.04	3.27	0.03	0.87	0.89
3	4121	Accounting and Bookkeeping Clerks	1.13	0.01	5.03	0.20	1.04	0.98
4	4190	Other Office Clerks	1.00	0.01	4.69	0.18	1.05	0.96
5	5122	Cooks	0.94	0.02	3.43	0.02	1.05	1.09
6	7129	Other Building Frame and Related Trades Workers	0.88	0.01	3.85	0.02	1.01	1.02
7	5133	Home-based Personal Care Workers	0.79	0.01	3.77	0.01	1.09	1.12
8	2419	Other Business Professionals	0.76	0.01	9.10	0.59	0.96	0.93
9	5220	Shop Sales Persons and Demonstrators	0.67	0.07	4.10	0.05	0.88	0.86
10	4211	Cashier and Ticket Clerks	0.64	0.01	3.63	0.05	0.94	0.91
	Total		9.42	25.5%				

Note: Age ratios refer to the ratio of the occupation workers' average age and the average of workers in all occupations.
Source: QP dataset (Figueiredo *et al.*, 2015).

Table 6 List of ten fastest decreasing jobs (in employment share), 1995–2009

	Job		Change in Emp Share (pp)	Employment Share 09	Median Hourly Wage	Share of Graduates	Age Ratio 95	Age Ratio 09
1	4122	Statistical and Finance Clerks	-4.53	0.054	6.03	0.22	0.97	0.98
2	9322	Hand packers and other Manufacturing Labourers	-2.73	0.017	3.63	0.02	0.92	0.96
3	7436	Sewers, Embroiderers and Related Workers	-2.59	0.024	3.00	0.00	0.84	0.99
4	7442	Shoe-Makers and Related Workers	-1.10	0.010	3.15	0.00	0.86	0.99
5	8282	Electrical-Equipment Assemblers	-0.96	0.003	4.86	0.01	0.82	0.98
6	8320	Motor Vehicle Drivers	-0.86	0.000	2.81	0.27	1.10	1.05
7	8264	Bleaching, Dyeing and Cleaning-Machine Operators	-0.66	0.003	3.44	0.01	0.97	1.04
8	8262	Weaving- and Knitting-machine operators	-0.66	0.003	3.75	0.00	1.02	1.07
9	3415	Technical and Commercial Sales Representatives	-0.55	0.019	8.52	0.24	1.02	1.00
10	7122	Bricklayers and stonemasons	-0.54	0.020	3.93	0.02	1.02	1.09
	Total		-15.19	15.2%				

Note: Age ratios refer to the ratio of the occupation workers' average age and the average of workers in all occupations.
Source: QP dataset (Figueiredo *et al.*, 2015).

*Table 7 List of ten most representative jobs (in employment share), 2009*

	Emp Share Rank	Job		Change in Emp Share (pp)	Median Hourly Wage 09	Employment Share 09	Share of Graduates	Age Ratio 95	Age Ratio 09
Decreasing	3	4122	Statistical and Finance Clerks	-4.53	6.03	0.054	0.22	0.97	0.98
	5	7436	Sewers, Embroiderers and Related Workers	-2.59	3.00	0.024	0.00	0.84	0.99
	10	3415	Technical and Commercial Sales Representatives	-0.55	8.52	0.019	0.24	1.02	1.00
	8	7122	Bricklayers and stonemasons	-0.54	3.93	0.020	0.02	1.02	1.09
	9	9312	Construction and Maintenance Labourers (roads, …)	-0.32	3.52	0.020	0.03	0.93	0.96
Increasing	7	8324	Heavy-Truck and Lorry Drivers	0.48	5.48	0.021	0.01	1.14	1.11
	1	5220	Shop Sales Persons and Demonstrators	0.67	4.10	0.072	0.05	0.88	0.86
	6	5122	Cooks	0.94	3.43	0.023	0.02	1.05	1.09
	4	5123	Waiters	1.27	3.27	0.042	0.03	0.87	0.89
	2	9132	Helpers and Cleaners (Offices, Hotels, …)	1.34	3.23	0.055	0.02	1.11	1.14
	Total			-3.85		35.1%			

Note: Age ratios refer to the ratio of the occupation workers' average age and the average of workers in all occupations.
Source: QP dataset (Figueiredo *et al.*, 2015).

The story that these three tables convey appears, at first glance, to show strong points of contact with Goos *et al.* (2014), as well as the broader polarization narrative. The list of top ten growing jobs include, for example, relatively low-skill personal and customer-related services jobs (for example, 5123, 5122, 5220, 4211), as well as relatively high-skill jobs, such as business professionals. The list of fast-decreasing jobs, in turn, also includes many of the occupations usually associated with middle-level jobs in the international literature, namely office clerks (4122), craft and related trade workers (7436, 7442), machine operators and assemblers (8262, 8264, 8282). A crucial difference regarding the Portuguese productive structure, however, is that many of these latter jobs – which are considered middle-skilled and middle-wage occupations in the context of other economies – cannot be classified as such here. It is informative to consider, for example, that the type of low-skilled personal- and customer-related services we mentioned above do not pay necessarily less on an hourly basis than the manufacturing-related jobs that have been destroyed to a greater extent.[2] In other words, while the shift from manufacturing to service-related jobs appears clearly, this does not necessarily affect very different groups across the wage distribution, which may mean that there will be much less severe consequences for the fate of the Portuguese middle classes than might be expected in more developed economies.[3] By contrast, the decrease in the relative importance of clerical or technical/sales representatives jobs (for example, 4122 and 3415) may have more substantial consequences for the middle classes; in particular, to groups located relatively high up in the earnings distribution.

In order to provide a more systematic account of such changes in the employment structure of the Portuguese economy, Figures 27 and 28 look at the changes in the employment share of wage-ranked and skill-ranked job quintiles during this period. In order to construct these quintiles, we initially ranked occupations based on their 1995 hourly wage and skill levels and then allocated these to specific quintiles, weighting each occupation by its number of employees. Each quintile should, therefore, correspond to close to 20 per cent[4] of the overall number of employees in 1995.

Figure 27 Changes in the employment share by wage-ranked 1995 quintile, 1995–2009
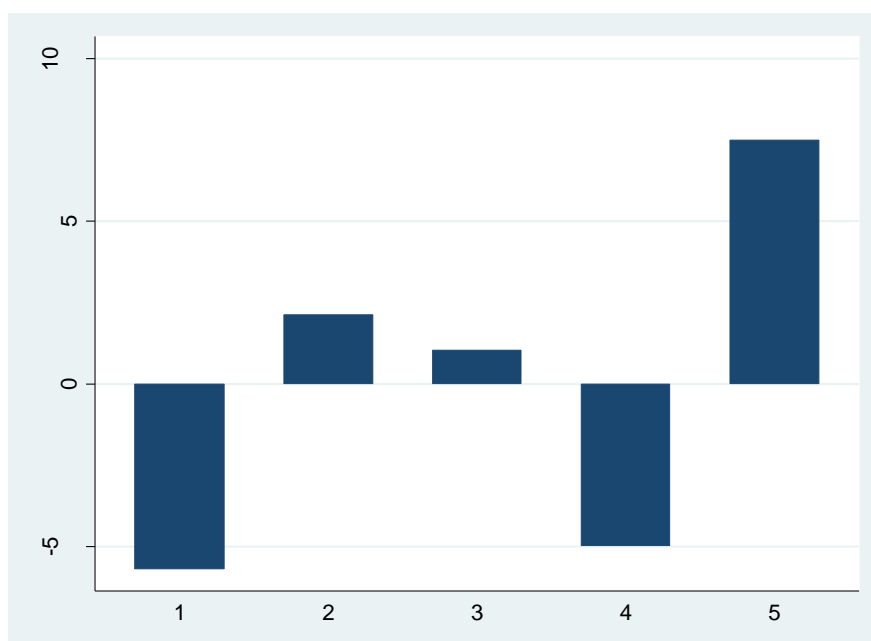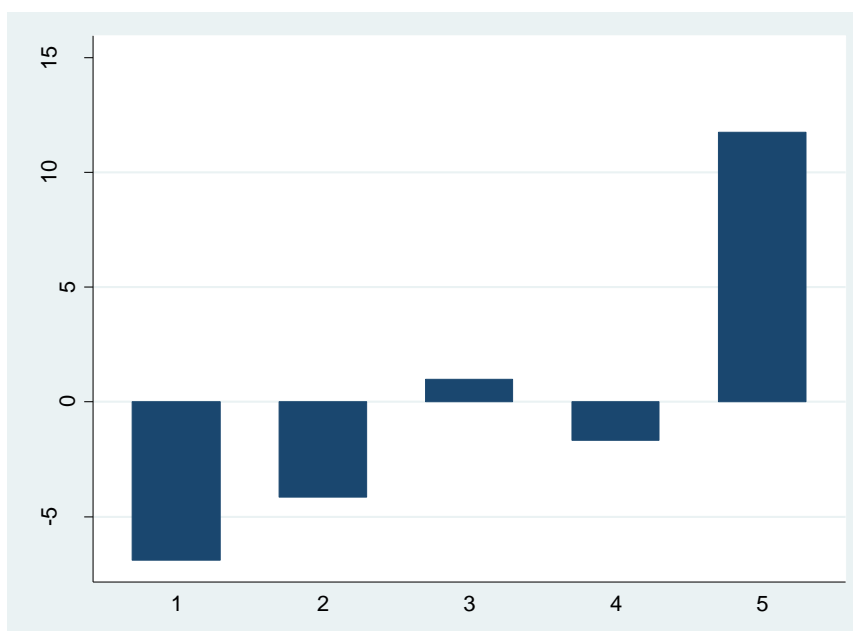

Source: QP dataset (Figueiredo *et al.* 2015).

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[2] Interestingly, a number of these relatively low-skilled services jobs appear to employ a disproportionate number of young people, in contrast to manufacturing-related jobs over this period.
[3] Fernández-Macías (2012) shows, for example, that 'less-knowledge intensive private services' – which includes activities in retail, hotels and restaurants – were an important source of employment creation in Portugal between 1995 and 2007, affecting the second, third and fourth earnings quintiles.
[4] Because workers are allocated to quintiles based on their occupation and some occupations are relatively large, each quintile does not necessarily represent exactly 20 per cent of all employees.

Figure 28 Changes in employment share by skill-rank 1995 quintiles, 1995–2009
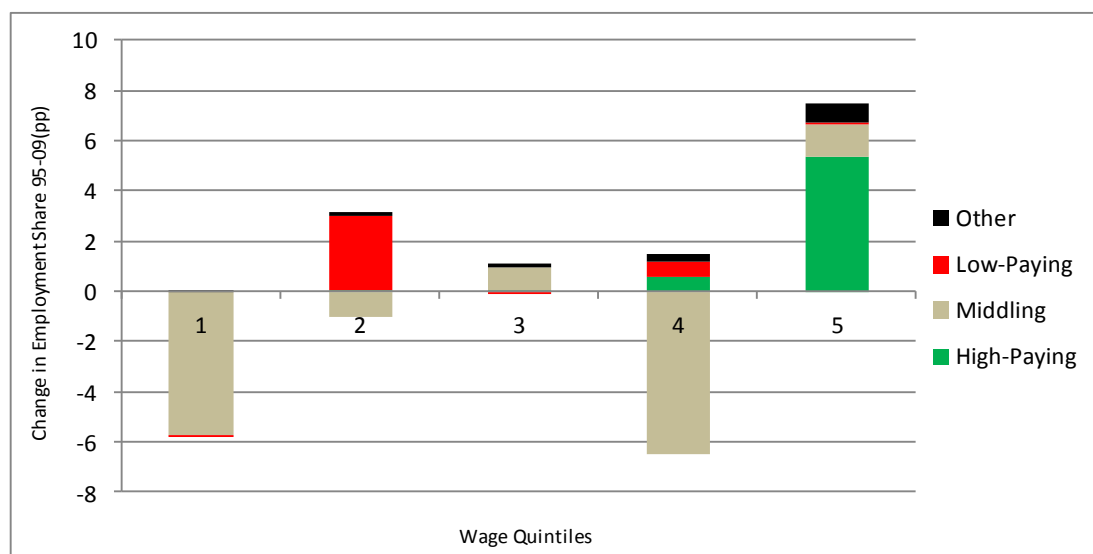

Source: QP dataset (Figueiredo *et al.*, 2015).

In both figures, it is possible to see that the most important changes during this period were the increase in the representation of the top-skilled and top-paying occupations in the initial year, as well as the important shift away from the bottom-paid and skilled occupations. This is largely consistent with the modernization and upgrading of the Portuguese productive structure. Also, when we look at skill quintiles, the pattern of upgrading is clear. Occupations that had already a higher share of university graduates in 1995 appear to have been the ones that increased the most in terms of their employment share. In order to contextualize this finding it is important to remember that the educational attainment levels of the Portuguese workforce also increased significantly during this period. We do not see, however, an unambiguous pattern of upgrading, namely when we look at the occupations' initial hourly wage level. There is, in particular, a strong decrease in the employment share of fourth quintile occupations which can perhaps be better understood by referring to some of the occupations we looked at in Tables 5–7.

In order to shed further light on this issue, however, we decompose the changes in the employment share of each quintile according to the contribution of four groups of jobs using Goos *et al.*'s (2014) classification of ISCO 2-digit jobs into low-paying (51, 52, 91 and 93), middling (41, 42, 71–74, 81–83) and high-paying (12, 13, 21, 22, 24, 31, 32 and 34) jobs.[5] Figures 29 and 30 present the results of this exercise. It is striking, in fact, that the revealed pattern is now clearly compatible with the polarization hypothesis, with most job destruction happening at the level of so-called middling jobs. A large portion of these middling jobs are, however, in the case of the Portuguese economy the lowest paid jobs, making this pattern of polarization compatible with some degree of apparent structural upgrading. In turn, jobs which in the international literature are considered low-pay are, in the context of the Portuguese economy, relatively skilled (in the sense of absorbing a higher percentage of university graduates), thus reinforcing the possibility of simultaneous upgrading and polarization.
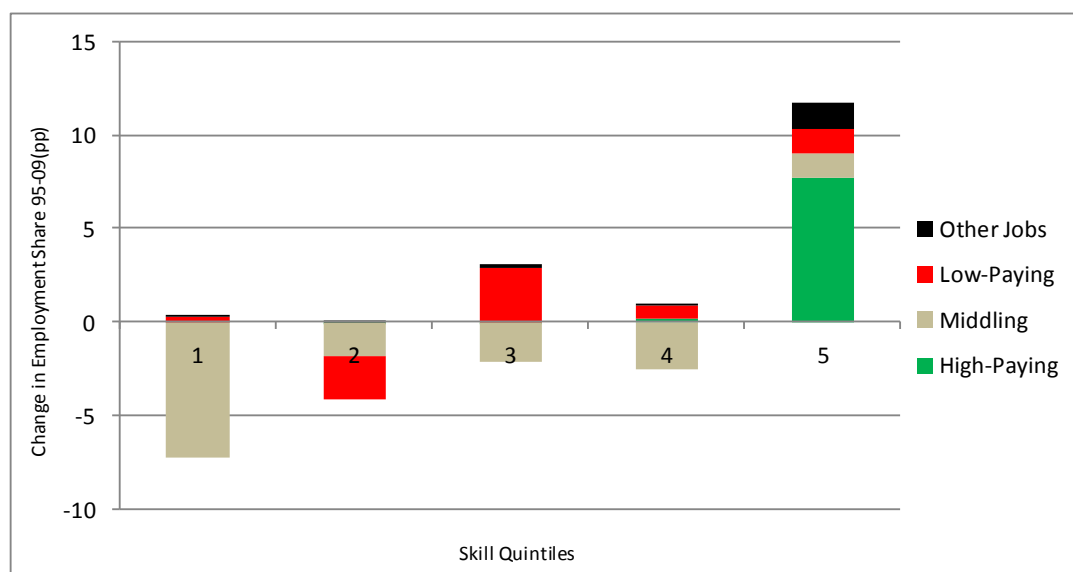
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[5] The fourth group corresponds to a residual category of all other jobs not explicitly considered by Goos *et al.* (2014).

Figure 29 Decomposition of wage quintile changes in employment share by type of job, 1995–2009

Source: QP dataset (Figueiredo *et al*. 2015).

Figure 30 Decomposition of skill quintile changes in employment share by type of job, 1995–2009

Source: QP dataset (Figueiredo *et al*., 2015).

Finally, we take a very quick look at changes (log differences) in all jobs' nominal hourly wages across this period (Figures 31 and 32). If the decline of employment opportunities in the lowest-paid jobs or quintiles of the distribution resulted in the displacement of a large number of workers and if these workers remained actively looking for similar jobs, we could expect strong downward pressure on wages. Conversely, if the creation of high-paying and high-skilled occupations greatly exceeded increases in the supply of workers with the necessary skills for such jobs we could anticipate increases in the relative wages of these jobs, with wage inequality growing as a result. The figures we present here, however, convey a different story because the lowest-skill and lowest-paid appear to be those with larger relative increases in their hourly wages. There are two possible – rather speculative – interpretations. On one hand, given the very low levels of pay in the Portuguese economy one would expect that minimum wage

legislation may have played a particularly important role in avoiding further decreases in the hourly wages of the lowest-paid jobs. Furthermore, the increases in the minimum wage levels witnessed during this period may have contributed to the larger relative increases in these jobs' hourly earnings. Second, this period is also characterized by important shifts in the educational attainment of the workforce. In 1995, for example, there were only slightly more than 4 per cent of university graduates in the whole dataset we used for these calculations. In 2009, the respective value was 15.5 per cent, with much higher values among the young. This means that the young and higher-skilled are unlikely to search for the same jobs as the previous, less-qualified generations of workers, thereby increasing the supply of workers competing for jobs in the top quintiles. In the opposite direction, flows into inactivity of the lowest skilled may also have played a role in curbing downward pressure on the earnings of the lowest paid occupations. At this stage these are fairly speculative hypotheses rather than well-grounded conclusions.

Figure 31 Change in hourly wages (log difference) of occupations ranked by 1995 wage level

Source: QP dataset (Figueiredo *et al.*, 2015).

Figure 32 Change in hourly wages (log difference) of occupations ranked by 1995 skill level
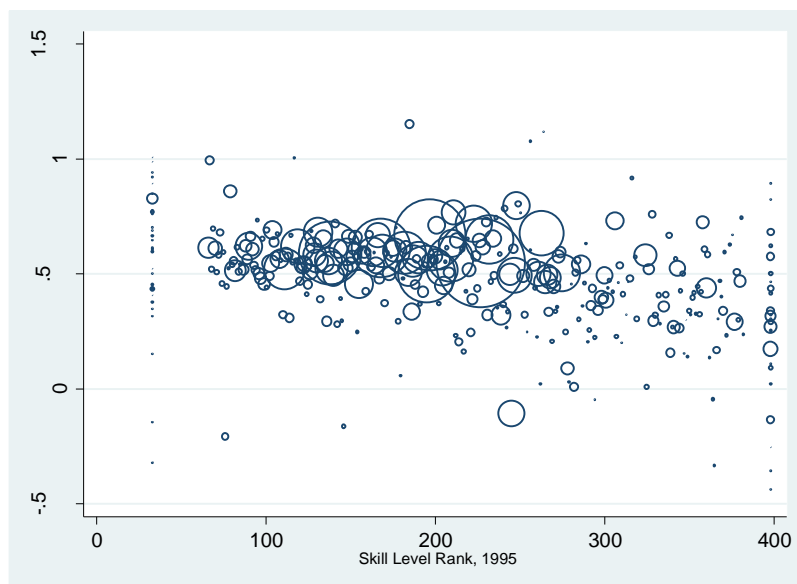
Source: QP dataset (Figueiredo *et al.*, 2015).

In sum, we can – tentatively – conclude that the type of structural upgrading we have just described and, therefore, the greater availability of better paid jobs may prevent, for the moment, a visible deterioration of the relative situation of the groups located in the middle of the skill or wage distributions. At the same time, the fact that the polarization story – as it is consistently described for other more advanced economies – also seems to lurk behind this upgrading suggests that we may be entering a period in which the level of wage inequality at the top of the wage distribution is likely to grow significantly. In other words, as the skill levels of the workforce grow and as relatively well-paid middling jobs disappear, a growing gap is likely to emerge between those able to access what *in the future* will be called bad and good jobs.