The evolution of wage structures in Portugal 1982-1992
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Citation for published version (APA):
Chapter 9

Final conclusions and remarks

This study has examined the wage structure and wage inequality in Portugal from 1982 to 1992. This was a period of adjustment during which time the country joined the EU and embarked upon a path of restructuring and modernisation of its economic activity. The economy grew rapidly after the mid-1980s and employment expanded. The labour market was functioning at nearly full-employment, thus giving a high score for Portugal in terms of macroeconomic performance. A series of institutional changes, such as deregulating the industry, initiating the privatisation of many state-owned enterprises, de-unionisation, and establishing mechanisms for social concertation also occurred. The primary tool of analysis was the wage equation relating individual wages to a large set of individual, job, and institutional characteristics.

9.1 Wage determinants

In the standard competitive model of the labour market workers are compensated according to their opportunity cost. Aside from compensation for job attributes affecting workers' utility, wage differences among individuals would reflect differences in human capital accumulated. In such a world, wages are determined regardless of the type of industry or firm, although short-run differences across industries or firms are conceivable. Wages would therefore be homogeneously determined in that, apart from compensating differences, individuals with the same amount of human capital would receive equal wages. Moreover, this is a long-run theory where it is assumed that each individual will obtain a proper job, given his amount of human capital, thus making the job requirement redundant. Education would have a unit-price characteristic throughout the labour market.

Our results indicate that differences in human capital accumulated do generate differences in wages. Individuals with higher levels of education, greater experience, or longer tenure with the employer earn higher wages, ceteris paribus. Nonetheless, the Portuguese wage structure seems to be far from what a competitive labour market would predict. Wages vary over individuals with the same observed amount of human capital depending on the region, industry, or firm in which they work. Furthermore, institutional factors do matter. In particular, the level at which collective bargaining takes place influences wages. Finally, job requirements do not seem to be redundant. There exist discrepancies between education actually attained by the individuals and that required by the jobs they perform; this influences the wage-effect of education: i.e. education does not have a unit-price characteristic. This price depends on realised job-worker matches.

The size and evolution of the returns to education were examined in detail. The results suggest much heterogeneity at this level. Returns vary across different margins (i.e. levels) of
the schooling distribution. They tend to be higher at higher levels of the schooling distribution. They are lower for females than for males. They are different across bargaining regimes and skill groups (white- and blue-collar workers). The effect of a year of education varies according to the allocation in the labour market. Years of education above the job requirement yield a positive but lower return than the return to years of required education. Years of education below that intended for the job are penalised. This coincides with most of the international evidence on the subject. Finally, the effect of education on wages is not equal across the conditional wage distribution. Returns are higher for individuals with higher positions in the conditional distribution (with 'better' unobserved earning capacities). This is also valid for the effect of years of required education and years of education above the job requirement. The same occurs if the schooling distribution is split into levels, but with minor exceptions for tertiary education.

A proper comprehension of the true returns to education is especially important in order to evaluate and formulate adequate policies. Typically, since the influential work of Mincer (1974), the estimation of these returns has relied upon the ordinary least squares (OLS) estimator. However, it has been argued that OLS estimates of the rates of return to education may be biased. An attempt was made to evaluate the size of the true returns to education for male workers. For this purpose, OLS, IV and selectivity-corrected Mincer-type wage equations were estimated. Identiﬁcation in the IV and in the selectivity-corrected models is achieved by making use of legal changes in the compulsory level of schooling. IV estimates of the return to schooling are as high or lower than those obtained with OLS. This result is at variance with evidence reported in other recent studies for other countries. For the selectivity-corrected equation the evidence is mixed. A reasonable interpretation of the results may be that an OLS estimation provides an upper-bound of the return to education. However, due to the nature of the identifying strategy, a generalisation of the results to the entire population may not be unambiguous. Speciﬁcally, the possibility of capturing only the return to education of a specific group (the low achievement group) cannot be dismissed.

With respect to the evolution over time, the rates of return to education increased over the period examined. This development is conﬁrmed for men and women, but was more pronounced for women. University education in particular is an investment with a high and rising return in Portugal. However, it should be stated that private universities were first permitted in the late 1980s; this will contribute to the increase of university graduates in the near future. To what extent such an increase in supply of university graduates will correct the recent rise in the rewards to this speciﬁc group is an intriguing issue.

Portugal has clear regional economic imbalances despite being a small country. The economy has generally been characterised by modernisation since the post-war period, but some asymmetries are noteworthy. In particular, the region of Lisbon and the Tagus Valley (LTV) has captured most of the high-tech and modern activities and has become a centre of rapid transformation. We analysed the rates of return on human capital in LTV and in the rest of the country in the period 1982-1992. For this purpose, an assignment model of heterogeneous
workers to heterogeneous jobs was set up and estimated. Its main implication, a high return being associated with similar workers being assigned to more complex jobs, was confirmed by the data. In LTV equally-skilled workers receive more complex jobs (thus a higher return on human capital) compared to the rest of the country. The process is demand-driven, with the new high-tech economy pulling highly skilled workers to the LTV region. The estimation procedure allowed us to obtain a simple, dimension-free parameter, which measures the heterogeneity in jobs and therefore the ease of substitution between worker types. This is called the complexity dispersion parameter. Calculations based upon its estimated value suggest that paying half the optimal wage is almost equal to doubling the cost per efficiency unit of labour.

The study indicates that non-competitive wage effects are substantial. For instance, wage differentials associated to firm size are very high when compared to other European countries. This may reflect a strong insider power in the few large firms existing in Portugal. The bargaining regime wage-effect was also examined. The main results reveal that wage differentials between bargaining regimes are in some cases sizeable. Moreover, the bargaining regime influences the wage structure. A comparison with recent results for the Netherlands indicates that wage differentials by bargaining regime are larger in Portugal. Particular emphasis was given to industry affiliation. The results indicate that this is very important for wage determination. To the extent that it is possible to compare the results from different studies, they suggest that the U.S. and Sweden occupy opposite points of the ranking. For instance, industry affiliation and human capital variables seem about equally important in the U.S., but human capital variables are more than ten times as important as industry variables in Sweden. Germany occupies an intermediate position between those two extremes. Portugal lies somewhere between Germany and the U.S. This suggests a significant range for lower-educated workers to boost their earnings if they manage to obtain jobs in high-wage industries.

Furthermore, an international comparison revealed a common finding that the size of inter-industry wage dispersion decreases as the country’s level of centralisation of the wage setting increases. The size of the inter-industry wage dispersion in Portugal is high and seems similar to that of countries rated as having a decentralised wage setting (U.S. and Canada). These large wage differences between industries for apparently equally-skilled workers indicate a great flexibility to exploit industry (or firm) specific conditions, and this may be related to particular circumstances regarding industrial relations. Portuguese industrial relations have been marked by multi-unionism and trade union rivalry. The employer side is also very fragmentary, with many associations organised at high digits of the industry classification. The bargaining unit seems largely determined by the organisation of the employer associations and, as a result, collective bargaining is very fragmented. There is also limited coordination among the many (small) bargaining units, and consequently across industries. Nevertheless, changes occurred and collective bargaining probably became more coordinated during the 1980s. Finally, because of adjustments pursued at the firm level by the employer, wages drift significantly over those bargained for the industry.
Unobserved ability and compensating differentials, which were emphasized in the study, are both consistent with the competitive labour market model. Indeed, the estimated industry-effect may be undermined by some bias that was impossible to take into account. For instance, unobserved workers' quality may bias the industry coefficients. If high paying industries are more likely to hire and attract more intelligent workers, the wage premiums in these industries are likely to be overstated or simply spurious. It could also be important to control for job/industry characteristics that are susceptible to compensation. Disentangling competitive and non-competitive forces is an important topic for further research and is crucial for policy making in the labour market. However, by using empirical evidence for other countries, in which it was possible to control for a large set of working conditions or difference out unobservable individual qualities, it is possible that they are not wholly associated to competitive effects.

If industry wage differences have a competitive quality, policy intervention is not called for. In such a case, we should believe that labour is rewarded at its opportunity cost and efficiently allocated across industries. However, if indeed they do have a non-competitive quality, this suggests the existence of good and bad jobs in the economy. Moreover, good jobs are likely to be rationed and envied by those working in low paying sectors. Because labour does not move freely between low- and high-paid industries, marginal productivity of labour is not equalised across sectors, thus resulting in allocative inefficiencies. In addition, rationing jobs in the high paying sectors increases the supply of labour to low-paid sectors and depresses wages below that which competitive equilibrium would predict (with negative effects in terms of industrial restructuring). For those who do not enter into the high paying sector, (perhaps because insiders manage to keep wages high, thereby reducing employment in this sector), wages in other sectors may be low in order to absorb the excess labour supply. An unattractive outside option in the unemployment sector (as has been pointed out in several studies for Portugal) may contribute to depress wages in the low pay absorbing activities. This is presently speculation, but the arguments may count when the time comes to outline policies for industrial restructuring and modernisation. It is likely that the high flexibility of wages, and consequently the capacity to create employment in Portugal, has been located into a very specific segment of the labour market (low-paid jobs), and supported by a non-generous and very strict unemployment benefit system. The analysis of this possible 'duality' and the mobility between high and low paying sectors is an avenue for future research.

Nevertheless, industry wage differentials shrank over the period examined (mainly after the mid-1980s). This occurred along with some centralisation of the wage setting, which corresponds with the notion that centralisation reduces inter-industry wage differentials. It is intriguing that inter-education wage differentials became more dispersed. If institutional change played a role here, the results suggest that centralisation/corporatism may not compress the wage structure across the board, but instead mainly may compress those wage-effects that do not fit into the competitive model. The process of deregulation of economic activity may have
also compressed the industry wage structure. Indeed, industry premiums were reduced after
the mid-1980s in high paying sectors subjected to deregulation.

9.2 What has really happened to wage inequality? How can it be explained?

The basic changes in inequality and the wage structure over the decade following 1982 are
summarised in Table 9.1. Overall wage inequality expanded during the 1980s and early 1990s.
This was also found in previous research undertaken by Cardoso (1997). It is clearly in
contrast with the hypotheses advanced in Gouveia and Tavares (1995).

Table 9.1: Basic changes in the wage structure and wage inequality

<table>
<thead>
<tr>
<th>Changes in overall wage inequality (sample standard deviation of log-wages)</th>
<th>total</th>
<th>men</th>
<th>women</th>
</tr>
</thead>
<tbody>
<tr>
<td>Changes in the male/female wage differential</td>
<td>+</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Changes in inter-industry wage dispersion (WASD)</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Changes in the returns to education:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Across different specifications of the wage equation</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Mincer’s model</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Thurow’s model</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>ORU equation</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Across different estimators</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OLS</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>IV</td>
<td>+</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Two-step method</td>
<td>+</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quantile regression</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Changes in residual wage inequality (standard deviation of the regression residuals)</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
</tbody>
</table>

The signs refer to changes from 1982 to 1992 except those concerning the IV and two-step method estimates, which refer to the 1986-92 period.

Changes in the wage structure in two primary arenas played a major role in raising
inequality for men and women. First, there was an increase in between-group inequality.
Second, there was an increase in within-group (residual) wage inequality. Despite this
evidence, the fundamental causes of these changes are not fully understood. But the results
indicate that market forces may explain a large part of the story; institutional variation may also have had some influence.

Let us begin by reiterating changes in between-group inequality. Rising returns to education were the main force increasing this source of inequality. In particular, changes in the return to required education contributed substantially to increase wage dispersion. Such an expansion in the price of education occurred along with a shift in the supply of labour towards more-educated workers. In a simple supply-demand setting, observed changes in the price of education require the demand for educated labour to outstrip the rise in supply. In other words, the process is apparently demand-driven.

A chief explanation for such a demand shift is skill-biased technological change. This conclusion is primarily based on the observed shift towards more-educated labour being mainly due to changes within industries rather than to a reallocation of employment between industries towards sectors requiring high-educated labour. Indeed, after joining the EU in 1986, the industrial composition of employment shifted in the direction of sectors that traditionally require low-educated rather than high-educated labour such as retail, restaurants and hotels (tourism), textiles (exports), construction (EU funded), and social services, so this does not explain the facts.

The forces operating within industries reflect a process of modernisation occurring in Portugal and may not be independent from the entry into the EU. First, structural funds from the EU as well as specific financial aids for industrial investment for modernisation of the productive structure have helped to instigate new technologies. Second, the liberalisation of trade with more developed countries that produce capital goods most likely encouraged Portugal to import technology requiring skilled labour.

An examination of the evolution of educational requirements for jobs and of education actually attained within the labour force provides further evidence on the issue. The distribution of actual education within the labour force, has moved upwards faster than the distribution of the education intended for the jobs. The supply side clearly won the race in terms of mean values. The supply-demand model, in its simplest version, would predict a reduction of the returns to education. This did not occur and so the evolution of the returns to education should not be interpreted in terms of mean values of actual and required education. The human capital model in its simplest version with perfect substitutability between education levels apparently does not work for Portugal. This conclusion critically depends on the quality of the data. In particular, it depends on the validity of measuring required education. The use of alternative measures (e.g. worker evaluation) would shed further light on this, but this type of data is not available for Portugal. We also think that a vast cross-country comparison would be useful.

Contrary to mean values, the demand dispersion increased faster than the supply dispersion. The process may thus remain demand-driven. The extension of the demand distribution relative to the supply distribution may indicate that the demand for higher educated workers has increased faster than their supply (probably due to technological advances). There is a clear
shortcoming, however. Although this story is consistent over time, it did not work very well with respect to regional variation.

We saw the existence of a consistent and formal setting for comparative static analysis as an important guide to the analysis. As a start we used the Tinbergen (1956) assignment model, which expresses explicitly the price of (required) education in terms of the means and dispersions of the frequency distributions for required and actual education. But this was not very helpful for interpreting the facts. We then derived a more elaborate model from the assignment literature and the work of Teulings (1995). The model is able to explain a higher return on human capital in Lisbon compared to the rest of the country, but it fails to explain intertemporal variation. Still, this type of analysis which relies on the assignment literature seems to be a promising avenue to pursue.

In the search for fundamental causes of the evolution of the returns to education in Portugal, other hypotheses can also be advanced. Moreover, their role may not be dismissed without testing. First, the increase in the returns to education may be capturing changes in the returns to omitted variables that correlate positively with education. In particular, vocational training increased much over the 1980s; this most likely enhanced the earning capacity of those who had received training. Training was omitted in all regressions and this may bias the coefficient of education upwards. This may occur when education and training co-vary positively and the return to training increases over time. Indeed, a positive covariance between education and training has been established for the U.S. (probably because more educated workers receive more training for the same reasons they attained more education, or that for some reason the provision of training programs was biased towards more-educated workers). Or possibly, all else being equal, the covariance between education and training may have increased over the period examined, thus producing an upward bias in the return to education when training is omitted. Such an increase amounts to changing the quality of labour among different educational groups over time. If that were the case, the huge training expansion undertaken in the 1980s contributed to the increase of wage inequality.

Second, the skill-biased technological change explanation relies on a non-uniform growth in the demand across educational groups favouring the more-educated. It is worth noting however, that in an economy such as Portugal, widening wage differentials probably appear even under uniform labour demand growth. Most likely, a very high number of low-educated workers in the informal or in the rural subsistence economy makes the unskilled labour supply very elastic. On the other hand, educated labour is manifestly scarce and thus its supply is inelastic in the short run. Even if demand for labour expands uniformly across educational groups, wages probably fan-out in favour of more-educated workers.

Finally, institutional changes may also have had a role. Privatisation and deregulation of the industry may have reduced wage premiums in some high paying industries, thus contributing to the reduction of this source of dispersion. At this level, the implementation of mechanisms of social concertation may have also played a role (see section 9.1). It was not possible to test for the real effect of de-unionisation. This process has been indicated as a source of increased
wage dispersion in the U.S., since despite minor exceptions, trade unions seem to compress the wage structure within their domain (e.g. the returns to education). Because the decrease in unionisation in Portugal was arguably sharp in the 1980s, it may have added to increase wage inequality.

The causes for increased within-group inequality are less clear-cut. One way of proceeding is to assume that unobservable attributes such as ability, motivation, leadership, and so on have been reaping higher rewards. Another possibility is that those unobserved dimensions of skill may have become more dispersed, ceteris paribus. If the former possibility holds, it may result from increased demand or decreased supply of unobserved skills. Juhn et al (1993) argue that the primary explanation for a rise in the price of unobserved components of skill in the U.S. economy is a demand shift, and we have no evidence that this was not the case in Portugal. Nevertheless, institutional changes may have played a role too. In particular, the privatisation of state-owned companies may have influenced the implementation of discretionary wage policies by the management in these companies based upon unobserved attributes.

9.3 Which model?

The wage structure changed in Portugal over the 1980s. In particular, rewards to education increased and contributed to expand wage inequality. The explanation that these changes occurred through shifts in homogeneous human capital in years of education does not work. The ORU specification is not perfect either but the dispersion hypothesis seems relevant over time. The Tinbergen model, as has been used here, seems restrictive since it uses only one variable: education. Perhaps in a future work we should bring in other control variables. The assignment model of chapter 7 is a closed form equilibrium structure and, when estimated, it works across regions but fails over time. We believe that further exploration of the assignment literature may be worthwhile. Although changes in job requirements are routinely included within explanations of shifts in the distribution of earnings, the use of formal models which explicitly account for the demand side of the labour market are normally absent in this type of analysis.

The quantile regression model may relate to unobserved variables: the position within the distribution. It is therefore an important tool for analysing changes in within-group wage inequality. As we have seen, the marginal effect of education upon that type of inequality tended to increase over time, despite a few exceptions. If workers at higher quantiles have better unobserved characteristics, and since the returns to education are high at higher quantiles, likely unobserved variables (such as ability) complement education to generate wages (see Mwabu and Shultz, 1996). This complementarity may have strengthened over time and contributed to expand inequality. This is naturally an important route for empirical research.

Although progress was made concerning the fundamental causes of the aforementioned changes, we are aware that more research and modelling are needed.