FACES OF JOBLESSNESS IN PORTUGAL: ANATOMY OF EMPLOYMENT BARRIERS

Daniele Pacifico and Céline Thévenot

Faces of Joblessness in Portugal

Anatomy of Employment Barriers

OECD
BETTER POLICIES FOR BETTER LIVES

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1. INTRODUCTION

This Policy Analysis Note (PAN) for Portugal assesses the characteristics and employment barriers of working-age individuals with no or weak labour-market attachment. It is one of six such country notes in a joint EC-OECD project covering Estonia, Ireland, Italy, Lithuania, Portugal and Spain. The objective of this project is to provide a novel perspective on employment difficulties, and to aid in the identification of policy approaches to overcome them. The project website at http://www.oecd.org/social/faces-of-joblessness.htm provides further information.

Each PAN develops profiles of key employment barriers and quantifies their incidence and intensity among jobless individuals and among those who work or earn very little or intermittently. The underlying conceptual framework and statistical approach is described in an associated methodological background paper (Fernandez et al., 2016; Immervoll and Isik-Dikmelik, 2016) and is consistent with that employed in a related EC-World Bank activity covering six further EU countries. The empirical results from each PAN will be used to inform a dialogue on policy approaches and options that could address the most prevalent employment barriers in selected population groups and strengthen their labour-market attachment. This dialogue will take place in a second part of the EC-OECD project. Its results and an associated policy inventory will be presented in a series of six Country Policy Papers (CPP).

A key motivation behind this project is the finding from the literature on activation and employment-support policies (AESPs), and on social protection systems more generally, that careful targeting and tailoring to individual circumstances are crucial factors for policy success.[1] However, policy discussions do not necessarily reflect this. They often refer to broader labour-market groups such as "young people", "older workers", "people with disabilities" or "lone parents". Similarities of employment barriers among members of such broader groups are implicitly assumed but not well documented (for instance, being "young" is not an employment barrier). As a result, policy interventions targeted on the basis of characteristics such as age, health status or family situation alone may be ill-adapted to the needs of jobless individuals and those with precarious employment patterns. An in-depth inventory of people's employment barriers, and an identification of groups who share similar combinations of labour-market obstacles, can contribute to a better match between individual needs and available support, and make associated policy interventions more effective and less costly.

Countries frequently seek to account for individual circumstances and labour-market difficulties by means of powerful statistical tools that "profile" individual benefit claimants using administrative data. Such tools are useful for tailoring the employment programmes that each registered individual is offered. They often rely on administrative data, which have distinct advantages, but tend to cover only a subset of the out-of-work population, such as the registered unemployed. As a result, the profiling tools built around these data typically cannot be used to provide a broader perspective on the employment barriers facing the entire population of those with no or weak labour market attachment. This note complements existing profiling instruments by adopting more of a "birds-eye" approach that considers the employment barriers of *all those with no or weak labour market* attachment. This sizeable and heterogeneous group constitutes the potential client group for AESPs. Understanding their employment barriers is not only important for linking up services provided by different institutions, but it is also essential for identifying groups who would benefit from employment-related programmes or incentives, and who are not currently clients of any of the institutions providing such measures.

A comprehensive assessment of potential employment barriers requires detailed information on people's skills, work history, health status, household circumstances and incomes. The European Union

1. See for example OECD (2013a, 2013b, 2014a, 2015a); Immervoll and Scarpetta (2012); Arias et al. (2014); World Bank (2013); European Commission (EC) (2015); Eurofound (2012).

Survey on Income and Living Conditions (EU-SILC) contains rich information for identifying and assessing potential barriers to employment and is the primary source of data for this note. EU-SILC offers cross-country comparability, an extended *reference period*[2] over which one can assess the respondents' main activity status, and detailed information on individual and family circumstances including people's work-related skills end education, work history, health status, income sources, tax liabilities and benefit amounts. However, there is a relatively long time-lag between data collection and availability (EU-SILC 2014 was made available in February 2016). EU-SILC also contains less detailed information on labour-force status than standard labour-force surveys.

In Portugal, 39% of the *working age population*[3] can be considered to face potential labour-market difficulties according to SILC data for 2014. The remainder of this note refers to this group as the "target population". Of these 39%, 29% did not work *at all* throughout the reference period[4] and a further 10% had "weak labour market attachment" with either unstable jobs, limited working hours or zero or near-zero earnings. Potential employment barriers that are particularly common among the "target population" include no *recent* work experience (74% of the target population), low education (73%), scarce job opportunities (43%) and health limitations (39%). Other potential barriers, such as high levels of non-labour income and care responsibilities are frequent for some sub-groups, but less prevalent overall.

The results of the statistical clustering analysis suggest that the target population can be separated into nine distinct groups with similar employment-barrier profiles within each group. Focusing on the prevailing characteristics in each group, the emerging clusters may be summarised as follows:

1. "Older women with health limitations, low education and limited work experience" (22% of those with no or weak labour market attachment)
2. "Prime-age long-term unemployed with low education and scarce job opportunities" (20%)
3. "Underemployed workers with low education" (12%)
4. "Early retirees with health limitations, low education and long employment record" (12%)
5. "Long-term unemployed youth without any past work experience and scarce job opportunities" (9%)
6. "Early retirees with weak financial work incentives" (9%)
7. "Women with low education and without any past work experience" (7%)
8. "Unemployed youth with limited work experience" (6%)
9. "Mothers with care responsibilities and limited work experience" (3%)

These group labels indicate that commonly used proxy groupings, which are commonly referred to in the policy debate, such as "women", "disabled", or "youth", include **distinct sub-groups with very different employment-barrier profiles**. For instance, the following combinations of employment barriers are common for women: low education with limited work experience (Group 1), low education without any past (paid) work experience (Group 7), and limited work experience and care responsibilities (Group 9). Employment barriers are also highly heterogeneous for youth (Groups 5 and 8) and older individuals (Groups 4 and 6).As shown in Section 4, these groups also differ markedly with respect to their poverty risks, material deprivation levels and other family or individual circumstances.

2. EU-SILC data provide information on individuals' labour-market status at different points in time during the reference year (each of the 12 months) and at the time of the interview. This note uses all 13 data points to characterise people's employment status.

3. Ages 18 to 64, excluding individuals in full-time education or compulsory military service.

4. This compares well with results from the EU Labour Force Survey, which show 39.4% as the proportion of working-age people in Portugal who were not in paid work during different points in 2013 (the reference year for the 2014 SILC). Some of them will have been out of work for only part of the year, so the LFS share is expected to be higher.

Most individuals in the target population face **more than one potential employment barrier simultaneously**. Four in five face *at least two* barriers, and about one half show *three or more*. For instance, as the label indicates, most of the "*Prime-age long term unemployed with low education and scarce job opportunities*" (Group 2) combine low labour demand in their labour-market segment with employability problems due to low education. Similarly, many "*Older women with health limitations, low education and limited work experience*" (Group 1) lack work experience, education and also have health limitations that may limit their availability for paid work. Addressing one type of employment obstacle may not be enough to boost employment levels. From a policy perspective, these results point to a need to carefully combine or sequence different activation and employment support measures, and to co-ordinate them across policy domains and institutions.

The rest of this note proceeds as follows. Section 2 provides some background information on the evolution of social and labour market conditions in Portugal and how this compares with other EU countries. Section 3 uses the most recent EU-SILC data to construct quantitative indicators of the intensity and incidence of different types of employment barriers. Section 4 applies a statistical clustering technique to organise the population of individuals with no or weak labour-market attachment into groups with homogeneous combinations of employment barriers. It also presents key demographic and socio-economic characteristics that are relevant for deciding policy priorities and approaches for each group. A short concluding section highlights selected possible directions for extending the approach further.

2. LABOUR MARKET AND SOCIAL CONTEXT

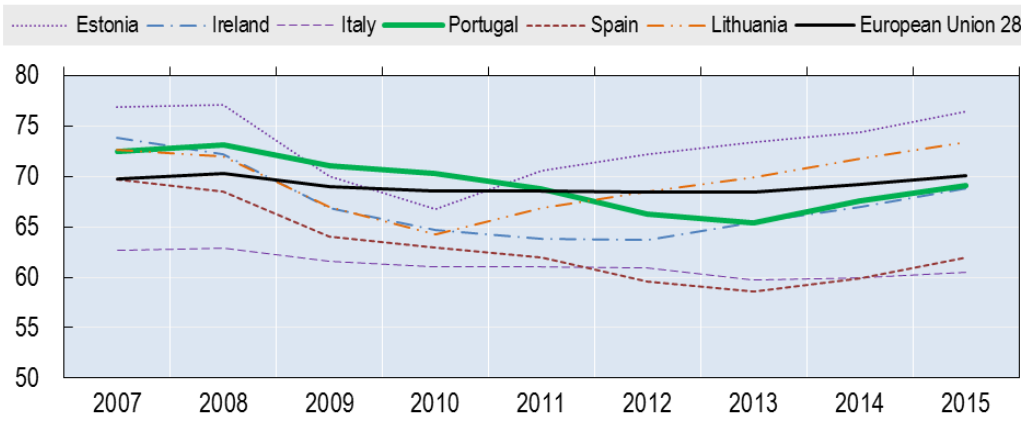
Trends in employment, unemployment and labour-market inactivity

As in all six countries covered in this project, the economic crisis has significantly impacted the labour market in Portugal, in turn causing increased poverty and material deprivation. The employment rate in Portugal was three percentage points (ppts) above the EU average before the onset of the crisis; it then fell steadily between 2008 and 2013 and started a mild recovery since then.

Figure 2.1 shows the employment rates in the six countries between 2007 and 2015 and compares these with the EU average. Employment rate in Portugal fell from 73 to 65% between 2007 and 2013, a fall similar to the one that occurred in Ireland and slightly less severe than in Spain. Employment rate then started to recover from 2013. The recovery occurred at about the same time as in Ireland or Spain, but later than in Estonia or Lithuania. The late start of the labour-market recovery meant that employment in Portugal remained well below its 2007 level in 2015, and also slightly below the EU average (70%). Recent projections for 2016 foresee a continued recovery during 2016 without, however, reaching pre-crisis levels (OECD, 2016a).

Figure 2.1. Employment rates: mild recovery from the crisis

In % of working-age population



Note: The EU average is weighted.

Source: Eurostat Labour Force Statistics.

Unemployment has also fallen significantly in Portugal in recent years (from 16.4% in 2013 to 12.6% in 2015) but remains high compared to both the EU average (8.8% in 2016), and the other countries studied in this project, with the exception of Spain (20%). Emigration contributed to recent labour-market adjustments in Portugal. On average, the number of people leaving Portugal exceeded arrivals by about 30 000 per year between 2011 and 2014 (approximatively 0.6% of the working age population), causing the working age population to shrink about twice as fast as it would have based on natural decline alone (European Commission, 2016). Increasing participation in training programmes (from 1.4% of the labour force in 2012 to 2.6% in 2016) may also have reduced unemployment, as unemployed people attending trainees are by definition (ILO) not registered as unemployed.

Long-term unemployment has declined more slowly. The share of unemployed who have been out of work for a year or more was 57% in 2015, compared to 48% for the EU on average. The share of unemployed people who have been unemployed for more than 48 months (very-long-term unemployment) also remains high at 5% in 2015, more than 2 ppts above the EU average (2.8%). As a share of the labour

force, long-term unemployment peaked at 9.3% in 2013 and declined to 7.2% by 2015 (the EU average in 2015 was 4.5%).

Despite signs of improvement in education level and school drop-out rates, the low level of education of the labour force is a major challenge for the labour market and a key reason for persistently high rates of long-term unemployment (European Commission, 2016, OECD, 2014, OECD, forthcoming). In 2014, only 65% of the population aged 25-34 had attained upper secondary education or higher, well below the EU average of 83%. Moreover, the gap in employment outcomes between those with high and low levels of education[5] is smaller than in most EU Member States, suggesting that macroeconomic skills mismatches, though on the rise, are limited, and that the demand for high-skilled workers is moderate. In the long run, however, the low skill level of Portugal's labour force can act as a barrier to the country's competitiveness. (European Commission, 2016; OECD, forthcoming). In recent years, Portugal has nevertheless made significant improvements in the educational attainment of its adult population (OECD, 2015e).

Activation measures are crucial to connect people with jobs. Over the period 2011-2015, Portugal took several steps to strengthen its activation framework (OECD, forthcoming). Recent measures have reduced the generosity of unemployment benefits, both in terms of the replacement rate of unemployment insurance and the maximum duration of benefits. Despite the fact that the recent reforms also strengthened the safety net provided by unemployment benefits (i.e., made them more accessible), they reach only 45% of the unemployed, and have a built-in bias towards older workers (due for example to existing links between benefit duration and age, see OECD, 2014; OECD, forthcoming). The offer of short-term training has been expanded while new hiring subsidies have been introduced and significantly ramped up since 2012: the number of beneficiaries of hiring subsidies increased from a very low number in 2011 to nearly 50 000 over the first ten months of 2015. However, there may be a need now to refocus some of these programmes on those who need them the most, i.e. youth and the long-term unemployed seem to benefit less from these programs (OECD. Subsidised internships have been designed to help groups at the margins of the labour market (particularly youth and the low-skilled) gain valuable work experience. Several changes were introduced to these programmes with the intention of broadening their coverage. As a result, the number of participants in these programmes increased significantly from less than 20 000 in 2011 to more than 70 000 in 2014. While subsidised internship programmes appear to have a positive impact on the employment outcomes of participants, further analysis suggests that the low-skilled appear to benefit less from such programmes than better skilled individuals (OECD, forthcoming).

The rise in unemployment in the aftermath of the economic crisis has particularly affected young people, whose unemployment rate reached 38% in 2013. It dropped to 32% in 2015, still 12 ppts above the EU average. One out of six young adults aged 15-24 is neither in a job, nor preparing for employment. The number of young people aged 15-24 not in employment, education or training (NEET) has also decreased since 2010 and at 11.3% in 2015 it was 0.7 ppts below the EU average. "Low-skilled" youth (those with a low level of education[6]) face much higher unemployment risks in Portugal than in other European countries (40% in 2014 compared to the EU average of 30%). In 2012, Portugal launched its strategic programme to tackle youth unemployment (*Impulso Jovem*, OECD, forthcoming). The reach of the programme is limited as the majority of NEETs are not registered with the Public Employment Service (OECD, forthcoming, European Commission, 2016). The government has acknowledged this challenge and has taken steps to simplify the registration process by means of an online platform. In addition an outreach campaign designed specifically for NEETs is being developed jointly with the ILO.

5. The education level refers to the ISCED classification. High education corresponds to upper secondary and post- secondary education (ISCED 4-6), low education corresponds to below secondary and primary levels of education (ISCED 0-2).

Incidence of economic hardship

Portugal has one of the most unequal income distributions in Europe. The Gini coefficient for the disposable income is high at 0.34 in 2013, against and EU average of 0.31. Between 2004 and 2009, inequality had been on a downward trend but inequality has subsequently remained at an elevated level since 2010. The at-risk-of-poverty rate is 2 ppts above the EU average (Table 2.1). Increases in poverty were most pronounced among the working age population, children and youths, while poverty increased only marginally among the elderly.. The proportion at risk of poverty or social exclusion (AROPE) is 28%, also above the EU average of 25% in 2014. It has been increasing since 2010, largely due to a sizeable rise in the number of individuals living in workless households or in households with very low work intensity.

Taxes and transfers alleviate market-income inequality in Portugal, but less so than in many other countries. Despite recent reforms, unemployment benefits reach only about 45% of the unemployed, and they have a built-in bias towards older workers (OECD, 2014a). Minimum income benefits are low in international comparison. Reforms undertaken in 2010 and 2012 led to a reduction in the number of eligible beneficiaries by over 40% (*ibid.*). The tax system is overall redistributive. In 2013, marginal rates were raised and all incomes above the national minimum wage were subjected to an "extraordinary income surtax" of 3.5%. At the same time, tax exemptions were reduced. Overall, while these reforms have shifted most of the burden to high-income households, simulations suggest that the lowest income group has also suffered significant losses (OECD, 2014b; Avram et al., 2012). Income support for the unemployed is close to the OECD average for initial stages of unemployment, but lower for long spells of joblessness. In 2012, more than 40% of the unemployed lived below the poverty line. Benefit levels remain heavily age-dependent. More generally, there have been concerns that the effectiveness and efficiency of programmes is weakened by the large number of measures intended to protect the most vulnerable groups, resulting in co-ordination challenges and overlapping benefits with possibly inconsistent sets of rules (OECD, 2014b).

Table 2.1. People at risk of poverty or social exclusion

2014, in % of people aged 16-64

	Portugal	Estonia	Ireland	Italy	Lithuania	Spain	EU28
People at risk of poverty or social exclusion	*28*	25	29	29	26	32	25
People at risk of poverty							
All	*19*	20	17	20	18	23	17
Not working	*32*	36	31	31	35	36	31
Working	*11*	12	6	11	8	13	10
full-time	*9*	11	3	10	7	10	8
part-time	*31*	20	11	17	24	23	16
Households without children	*16*	25	15	16	18	16	15
Households with children	*23*	18	16	24	20	28	19
People living in households with severe material deprivation [1]							
All	*10*	6	9	12	12	8	9
Households without children	*10*	7	6	10	16	6	8
Households with children	*11*	5	10	13	12	9	10
People living in households with very low work intensity [2]	*13*	8	21	13	9	18	12

1. Individuals aged 18-64.

2. Individuals aged 18-59.

Source: Eurostat (EU-SILC 2014).

Target groups for activation and employment-support policies

Individuals with labour market difficulties frequently move between non-employment and different states of "precarious" employment. As a result, limiting attention to "snapshots" of non-employed (or underemployed) individuals at a specific point in time, such as those based on labour force surveys, may not capture the true extent of labour-market difficulties or the need for policy intervention. To cover the

potential scope of AESPs, the **target population** of the analysis in this note therefore includes working-age individuals who are "*persistently*" *out of work* (either unemployed or labour-market inactive for more than 12 consecutive months) as well as individuals whose labour-market attachment is "weak".[6] "Weak" labour-market attachment can include individuals with *unstable jobs* working only sporadically, those on *restricted working hours*, and those with *very low earnings* (due to, for example, working informally or in very low productivity self-employment). Box 2.1 defines the sub-groups of this population and explains how they are identified using the EU-SILC data. The target population is a sub-set of the *reference* population of working-age adults relevant for AESPs. The **reference population**, in turn, is defined as all working-age adults except for full-time students and those in compulsory military service as these groups are typically outside the scope of AESPs. For simplicity, the rest of this note also refers to this reference group as the "working-age population".

Clearly, not everybody experiencing potential labour market difficulties may be an intended target for AESPs.[7] The *broad* definition of labour market difficulties adopted in this note is not intended to be *prescriptive* about the appropriate scope of AESPs; instead, it seeks to inform policy decisions by documenting the employment barriers and circumstances of individuals with no or weak labour market attachment. The approach is thus *descriptive* and takes no position on whether policy intervention is justified for specific groups. The resulting profiles of employment barriers are intended to facilitate discussions of the strengths and limitations of different policy interventions for concrete groups of individuals. They can also be used to help inform decisions on whether to channel additional policy efforts towards specific priority groups.

6. We do not attempt to distinguish between voluntary and involuntary joblessness or reduced work intensity. Individuals can of course choose to be out of work, or in part-time or part-year employment, voluntarily, and some surveys ask respondents whether they "want to work". However, those saying they do not want employment, or prefer to work part-time or part-year, may do so as a result of employment barriers they face, such as care obligations or weak financial incentives, which policy might potentially address. If extended voluntary labour-market inactivity or underemployment creates or exacerbate certain types of employment barriers, it may subsequently give rise to involuntary labour-market detachment or partial employment in later periods.

7. It is worth noting that, with a definition of working-age as 18-64, some individuals whom policy makers may wish to include in the scope of AESPs are not included in the target group in this note. Although the 18-64 age cut-offs are common in comparative empirical work, they are becoming less suitable as populations age, especially in countries that are actively seeking to increase retirement ages beyond 65.

Box 2.1. Individuals with potential labour market difficulties (target population)

The target population in this note includes those who are persistently out-of-work, as well as those with weak labour-market attachment.

The **persistently out-of-work** population (*long-term unemployed* or *inactive*) includes individuals reporting no employment activity throughout the *reference period*. The reference period corresponds to 12 consecutive monthly observations in the *income reference year* (January-December of year T-1) plus one additional observation at the *moment of the interview* (in year T).

The group with **weak labour market attachment** refers to individuals reporting employment activity during the *reference period* matching any of the following three situations:

i) **Unstable jobs**: individuals working only a limited number of months throughout the reference period. The threshold is equivalent to Eurostat's low-work-intensity measure: Above zero but no more than 45% of potential working time in the income reference year. To reconcile information reported for the income reference period and at the moment of the interview the following individuals are also considered in this group: 1) Workers who report no work activity during the income reference period but who are working at the moment of the interview and, 2) workers with between 45% and 50% of work activity during the income reference period who do not report any work activity in either the last month of the income reference period or at the moment of the interview.

ii) **Restricted hours**: workers who spent most or all of the reference period working *20 hours or less* a week.[1] However, individuals working 20 hours or less who are not likely to have additional work capacity, e.g. due to ongoing education or training, are excluded.

iii) **Near-zero earnings**: individuals reporting some work activity during the income reference period but negative, zero or *near-zero* monthly earnings.[2] In addition to possible classification error, situations included in this group could signal potential labour market difficulties, such as underpayment and/or informal activities.

1. The 20-hours threshold is approximately in-line with the 45% "part-year" threshold that identifies the group with unstable jobs. For a 40-hours working week in a full-time job, 45% of full-time would correspond to 18 hours a week. However, in SILC, the distribution of working hours in the main job shows a high degree of bunching at 10, 15, 20 and 25 hours a week. As the closest multiple of 5, a value of 20 hours was therefore chosen.

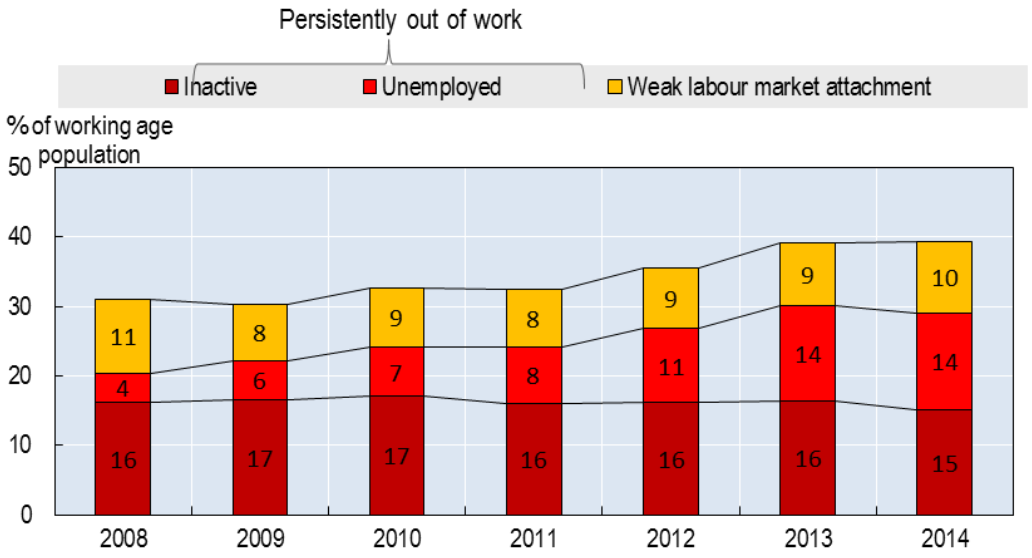
2. The near-zero earnings threshold is set in Portugal at EUR 102/month. This value corresponds broadly to the 1st percentile of the SILC earnings distribution.

Figure 2.2 shows the *evolution* of the target population in Portugal between SILC survey years 2008 and 2014 (since the reference period is the year prior to the interview, these data refer to the period 2007 to 2013). The proportion of working age adults who were persistently out of work and economically inactive remained broadly constant throughout this six-year period, at around one sixth of all working-age individuals. However, the proportion of long-term unemployed increased from 4% of the working age population in 2007 to 14% in 2013. This is consistent with the pattern based on LFS data discussed earlier in Section 1 of falling static employment rates and rising unemployment, as discussed above.

Figure 2.3 shows the size and composition of the target population in SILC 2014. Of the 74% who were out of work throughout the reference period, most were unemployed (36% of the target population) or retired (18% of the target population). 13% reported that they were engaged in domestic tasks, and 5% that they were unfit to work. 26% of the target population did hold some paid employment during the reference period, but belong to the "weak labour-market attachment" category. The majority of them spent most of the reference period out of work (unstable jobs) and 2% worked less than 20 hours a week throughout the year. 9% of the target population worked full-time throughout the year, typically as self-employed, but report having zero or "near-zero" earnings.

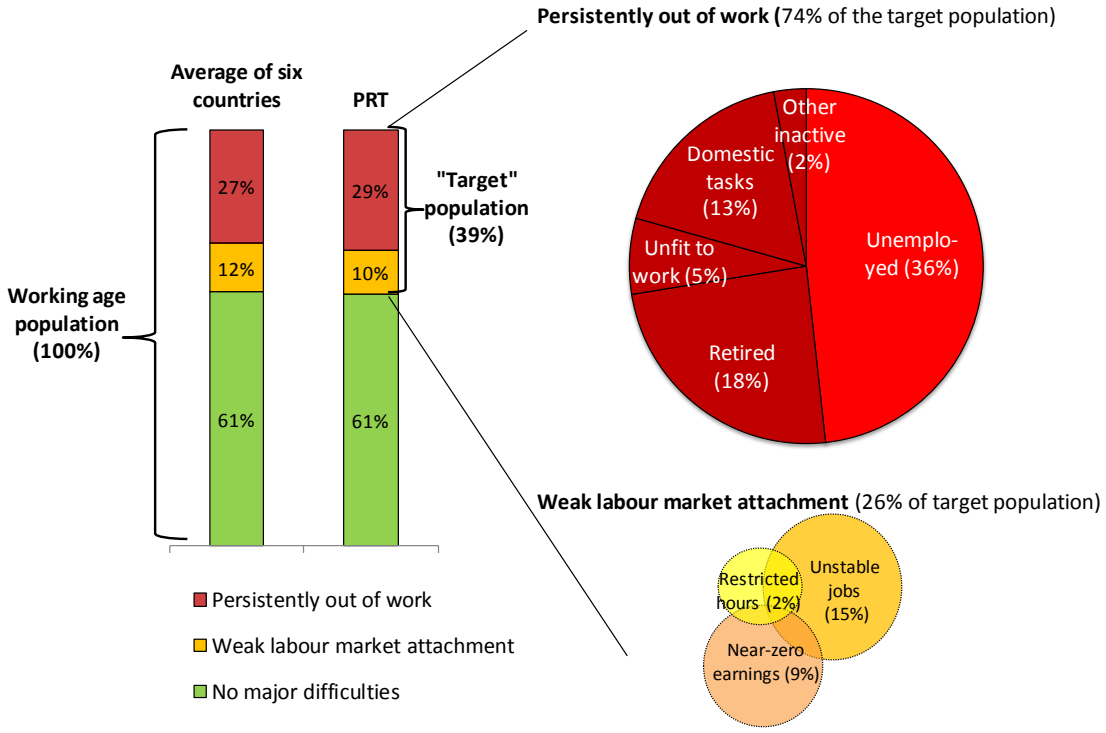
Figure 2.2. Dynamics of population groups with potential labour market difficulties

In % of working age population



Source: Calculations based on EU-SILC 2008-2014. See Box 2.1 for the definitions of the three groups.

Figure 2.3. Composition of the Portuguese population with labour market difficulties



Note: The six-country average is unweighted.

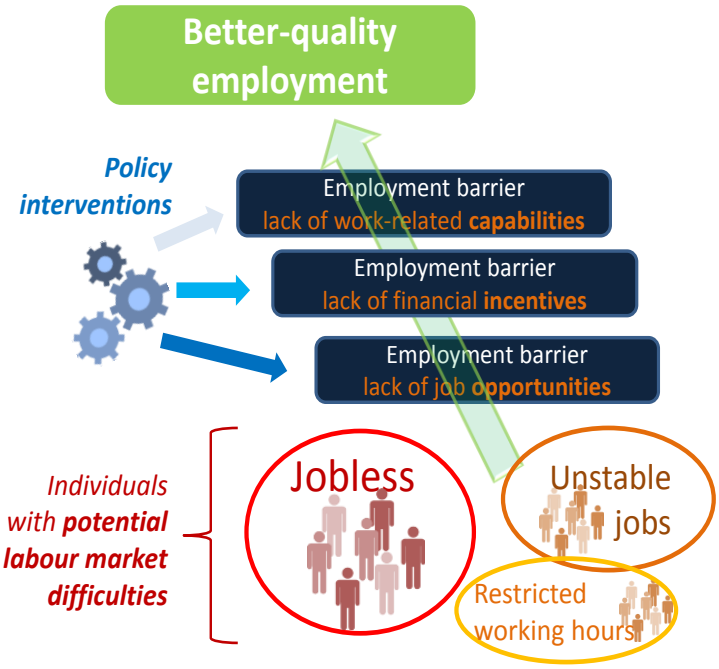
Source: Calculations based on EU-SILC 2014. See Box 2.1 for the definitions of the three groups.

3. EMPLOYMENT BARRIERS IN PORTUGAL

Working age individuals with no or weak labour-market attachment may face a number of employment barriers that prevent them from fully engaging in employment activities. A thorough understanding of these barriers is a pre-requisite for designing and implementing policy interventions in a way that is well-targeted and suitably adapted to the circumstances of different policy clients. Following Immervoll and Scarpetta (2012), this note examines three types of employment barrier, namely:

- **Insufficient work-related *capabilities*** , e.g. a lack of skills, work experience, care responsibilities and health-related limitations;
- **Lack of *financial work incentive* to look for a "good" job**, e.g., because of low potential pay, relatively generous out-of-work benefits, or access to high levels of income independent of own work effort (such as capital income or high earnings of other family members);
- **Scarce *job opportunities***, e.g., a shortage of vacancies in the relevant labour-market segment due to shocks or cyclical factors, or because of skills mismatch, discrimination, dual labour markets or other frictions in the labour market.

Figure 3.1. Employment barrier: conceptual framework



Source: Fernandez et al. (2016).

The employment barriers outlined above cannot all be measured directly. To operationalise the concepts, this note implements a set of workable indicators under each of the three main categories. Fernandez et al. (2016) provides a fuller discussion of the indicators and their rationale, including descriptive statistics for selected countries, as well as indications of other barriers that may be relevant but are difficult or impossible to measure with available data. The indicators used in this note are as follows:

- **Capability, item 1. "Low" education**. The indicator takes the value 1 if an individual has a lower-secondary degree or less (ISCED-11 standards).
- **Capability, item 2.** Two measures of **work experience**:
  - **No *recent* work experience:** if an individual did no paid work during the reference period (i.e. they were without employment for at least 12 months).
  - **"Low" relative *total* work experience:** the indicator takes one of three values: 1 for those who have *no past work experience at all*, 2 for those who have *some* work experience but have worked *less than 60%* of the time since they left full-time education, and 3 otherwise (i.e., if their total work experience is not "low").
- **Capability, item 3. Health limitations:** If an individual reports some or severe long-standing physical or mental limitations in daily activities.
- **Capability, item 4. Care responsibilities:** if an individual has a (minor or adult) family member who requires care[8] and is either *the only* potential care giver in the household, or the only person in the household who is economically inactive or working part-time *because of care responsibilities.*
- **Incentives, item 1. "High" non-labour income:** if the household's income other than that relating to the work efforts of the individual in question,[9], is more than 1.4 times the median value among the reference population (EUR 4 790/year, adjusted for household size).
- **Incentives, item 2. "High" earnings-replacement benefits:** if an individual's earnings-replacement benefits received during the reference year exceed 60% of their estimated potential earnings in work.[10]
- **Opportunity (one item only). "Scarce" job opportunities:** if an individual has a "high" risk of not finding a job despite active job-search during at least seven months, and willingness to take up employment (as stated at the moment of the SILC interview). The risk is estimated in a regression including region, age group, gender, level of professional skills and education as independent variables and being long term unemployed or involuntarily working part time as the dependent variable (see Fernandez et al., 2016 for more details). Individuals with an estimated risk of more than 1.6 times the median value in the working-age population are considered to face "scarce" job opportunities. Scarce job opportunities not only present a barrier to employment in the short term, but if jobseekers become discouraged and stop active job search, it could lead to further problems in the longer run.

Table 3.1 shows the share of individuals in the *target* and the broader *working-age* populations facing each employment barrier. As expected, and as required for the employment-barrier indicators to be plausible, the incidence of each barrier is significantly higher in the group with potential labour-market difficulties (i.e., the target population). In most cases, barriers are also more prevalent among those who were out of work throughout the entire reference period than for those with weak labour-market attachment. Consistent with the discussion of skills deficiencies in Section 2, the most common barrier in Portugal is low education, which is faced by about three quarters of the target population. "Scarce job

8. Family members assumed to require care are children under the age of 12 receiving less than 30 hours of non-parental childcare a week and adults reporting severe limitations in daily activities due to their health and being economically inactive throughout the reference period (and in the case of those of working age, that permanent disability is the reason for their inactivity).

9. This includes earnings, individual-level earnings replacement benefits, and the individual's share of household-level earnings replacement benefits.

10 . Potential earnings are estimated in SILC with a regression model corrected for sample selection. See Fernandez et al. (2016) for details.

opportunities" also remains a major barrier after the labour-market downturn, affecting more than two fifth of the target population. A special case is the "no recent work experience" barrier, which not only acts as a potential employment obstacle but also is a direct result of the way the target population is defined: by definition, those who were persistently out of work did not work at all during the reference period. As a result, 100% of this group are shown as facing "no recent work activity" as a potential barrier.

The other employment barriers, in particular, "care responsibilities", "high levels of non-labour income" and "no past work experience", are somewhat less prevalent overall, but they are still important for some population sub-groups as shown in Section 4. It is also worth noting that only 10% of the target population receive "high" levels of earnings replacement benefits. As a result of low benefit coverage, work disincentives from that channel do not affect large numbers of jobseekers. However, other "inactivity" benefits, such as those available for early retirees, might limit the financial attractiveness of employment for some groups. This is confirmed by the profiling analysis in Section 4, which identifies a sub-group of individuals who receive "high" levels of early-retirement pensions compared to potential earnings.

Table 3.1. Employment-barrier indicators

% of population facing different types of barrier

	Working age population	"Target" population		
		All	Persistently out of work	Weak labour market attachment
Insufficient work-related capabilities				
"Low" education	61	73	77	64
No past work experience	4	11	15	0
Positive but "low" relative work experience	14	27	29	19
No recent work experience	29	74	100	0
Health limitations	27	39	43	28
Care responsabilities	3	7	9	4
Lack of financial work incentives				
"High" non-labour income	30	28	28	28
"High" earnings replacements	5	10	12	8
Scarce job opportunities				
Scarce job opportunities	17	43	46	33

Note: See text for definitions and thresholds.

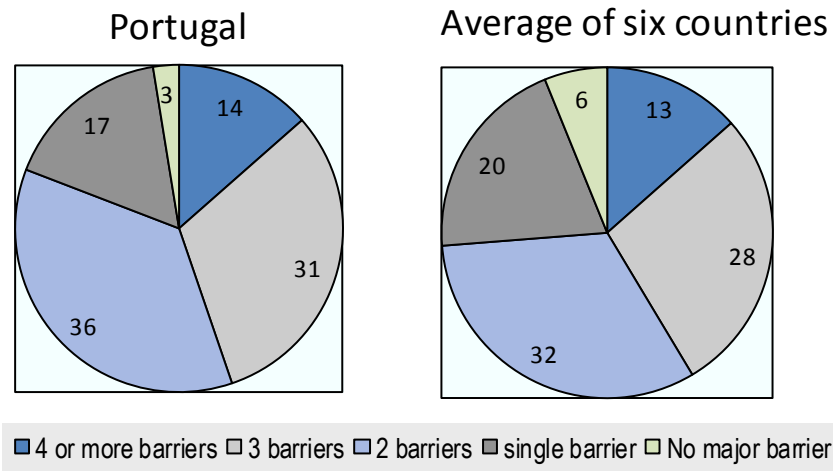
Source: Calculations based on EU-SILC 2014.

In practice, people's individual and family circumstances are complex and often lead to situations where they face multiple barriers to employment. In addition, and particularly in Portugal where long-term joblessness has been common, employment barriers may multiply or intensify when labour-market detachment, unsuccessful job search, or marginal/unstable employment continues over longer periods of time (e.g. because of depreciating skills, erosion of potential wages, or declining motivation). Figure 3.2 shows the number of (simultaneous) barriers faced by individuals in the target population. Nearly two fifths face two barriers simultaneously, close to one third face three, and 14% face four or more barriers. Around half of the target group are affected by three or more simultaneous barriers.

On the other end of the spectrum, only 3% face no major employment barriers. For this group, the employment-barrier indicator is either below the respective thresholds used in this note, or they are not working or underemployed for reasons unrelated to the barriers discussed here. The next section uses a statistical clustering technique to examine which combinations of employment barriers are most common in Portugal.

Figure 3.2. Number of simultaneous barriers

% of target population



Note: The six-country average is unweighted.

Source: Calculations based on EU-SILC 2014.

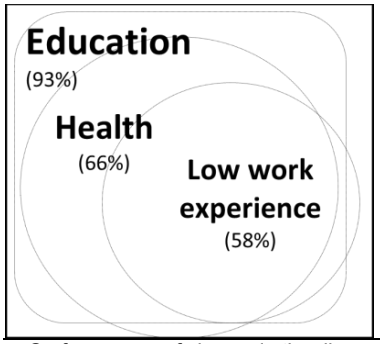
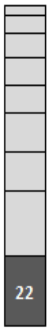
4. FACES OF JOBLESSNESS IN PORTUGAL

This section applies the method described in Fernandez et al. (2016) to *segment* the target population into groups of individuals with *similar combinations* of employment barriers. Using the 2014 SILC data for Portugal, the segmentation process leads to the identification of **nine groups** of individuals with no or weak labour market attachment (the "target population").[11]

The following paragraphs describe each group in detail. At the end of each paragraph a box reports a Venn diagram showing extent and degree of overlap of the main barriers characterising the group, as well as a list of selected individual and household characteristics with a "high" probability of occurrence within the group. Together, this information can help attach suitable labels ("*faces*") to group members, although the labels are necessarily arbitrary to some extent and cannot substitute for careful examination of the comprehensive list of employment barriers and socio-economic characteristics, as reported in Annex Tables A.1 and A.2.

Group 1 (**22%** of the target population): ***"Older women with health limitations, low education and limited past work experience"***. This group is characterised by late-middle age (average 55 years old) women (78%) who are currently labour market inactive (73%). The most common barrier to employment in this group is low *education* which is a problem for 93% of individuals (7.6 years of schooling on average). The next most common barrier is a long-standing physical or mental *health limitation* (66%) with 20% suffering from *severe* health issues. All have *work experience* (on average for 22 years) but for 58% of them this is low relative to their potential experience, reflecting possibly career breaks or early exits from the labour market. This past work experience was also at a low professional skills level, i.e. elementary occupations (30%) or craft and machine operators (32%), which could further reduce their re-employability possibilities. 27% live in households with high levels of income from other sources than own income from work, such as a partner's earnings or private pension, and this could weaken their financial *incentive* to undertake paid work. Only 6% were actively seeking a job at the time of the interview showing that the majority of the group are not motivated to re-enter the labour market.

Box 4.1. Group 1: "*Older women with health limitations, low education and limited work experience*"

Main employment barriers[(1)]	Selected characteristics[(2)]	% of the target pop.
	- 55 years old (average) - Women - Labour-market inactive - 22 years in paid work (average) - Former professions: craft, machine operators, elementary occupations - 7.6 years of schooling (average) - Average equivalised disposable income: EUR 7 097 (3rd quintile[(3)]) - 2.6 simultaneous employment obstacles (average)	

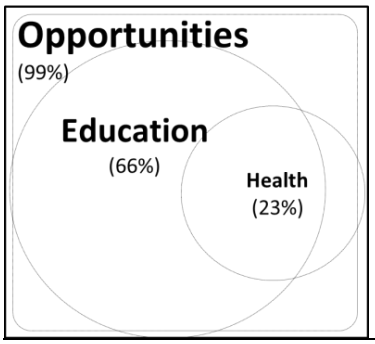
1. Surface areas of shapes in the diagram are proportional to the number of group members facing the related barrier ("Proportional Venn Diagrams"). The outer square represents the group size (100%). The diagram shows the three most prevalent barriers in the group and is based on the indicators discussed in Section 2. An exception is the recent work experience indicator. Although this indicator is included in the numerical results in Annex Table A.1, it is not shown in the diagrams as its high prevalence (due to the strong two way causal link with the other barriers) would dominate all other barriers in the graphical representation in all but two groups.
2. Characteristics that distinguish this group from other groups, i.e., categories that have a high probability of occurring in the group. Table A.2 reports individual and household characteristics in more detail.
3. Income quintiles are calculated for the entire national population.

Source: Calculations based on EU-SILC 2014, see Annex Tables A.1 and A.2 for full results.

11. Annex A outlines the segmentation method and the process that lead to the identification of the 9 groups. Fernandez et al. (2016) describes in detail the econometric model and the related methodological framework.

Group 2 (**20%** of the target population): **"*Prime-age long-term unemployed with low education and scarce job opportunities*"**. This group in prime age (85%) was unemployed during most of the reference period (99%). Only 14% of them found a job by the time of the interview while 82% were still actively looking for work. The most common employment barrier is therefore an overall lack of *job opportunities* (99%) which can partially depend on the low level of work-related capabilities characterising this group. 66% have indeed low *education* (41% have a primary education while another 25% a lower secondary degree) and their past occupation was at "low" skills levels, typically as craft/machine operators (35%) or clerks (30%). 23% also face *health limitations*. 41% are at risk of poverty and 42% face material deprivation (with half of those being *severely* deprived). 45% received unemployment benefits (EUR 6 204/year) and 31% family benefits (EUR 906/year).

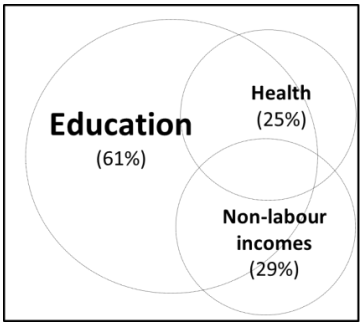
Box 4.2. Group 2: "*Prime-age long-term unemployed with low education and scarce job opportunities*"

Main employment barriers	Selected characteristics	% of the target pop.
	- 43 years old (average) - Unemployed - Length of unemployment spell: 12+ months (average) - 21 years of paid work (average) - 10.9 years of schooling (average) - Average equivalised disposable income: EUR 6 867 (2nd quintile) - 2.4 simultaneous employment obstacles (average)	

Group 3 (**12%** of the target population): ***"Underemployed workers with low education"***. Individuals in this group are of prime working age (average age 46) and report some recent employment activity with 86% working at the time of the interview. Despite the high level of employment their labour market attachment remains weak with 33% having unstable jobs, 23% working with restricted working hours (spent most or all of the reference period working 20 hours or less a week) and 56% reporting zero or near-zero earnings. 73% of those with restricted working hours could not find better employment or work more hours during the reference period, while those with unstable jobs were employed at the moment of the interview (46% full time and 54% part time). The sub-group reporting zero or near-zero earnings has many self-employed (80%) who worked throughout the entire reference period reporting strictly positive earnings (89%) with an average of EUR 685/year; the main sectors of activity were wholesale and retail trade (23%), agriculture (15%), transport (14%) and construction (11%).[12] The major barrier to employment in this group is low *education* (61%), while other less frequent barriers are *health limitations* (25%) and the possibility to draw on significant incomes that do not depend on own work effort (29%), which might weaken work *incentives*. The low overlap between these barriers (see Figure 4.1) indicates however that they affect employment outcomes rather independently.

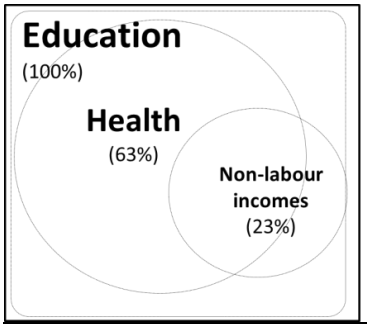
12 . Annex Table A.3 reports additional statistics for the sub-group with near-zero earnings.

Box 4.3. Group 3: "*Underemployed workers with low education*"

Main employment barriers	Selected characteristics	% of the target pop.
	- 46 years old (average) - Employed - 26 years of paid work (average) - 11.1 years of schooling (average) - Average equivalised disposable income: EUR 6 949 (2nd quintile) - 1.3 simultaneous employment obstacles (average)	

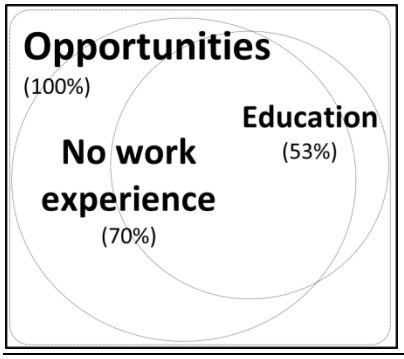
Group 4 (**12%** of the target population): **"*Early retirees with health limitations, low education and long employment record*"**. Individuals in this group are in old age (93%, 60 years old on average) and have worked their entire adult lives (41 years on average) but are now largely labour market inactive (59%). Only 14% are still actively looking for work at the time of the interview and 16% received unemployment benefits. This group has the second lowest *education* level of all nine groups (seven years on average) and this can represent a potential barrier to re-employment for all group members (100%). Low education in this group is also associated with "low" professional skills, with 59% reporting professions such as craft and machine operators (42%) or elementary occupations (17%) in their previous job. The other two major barriers to employment are a long-standing physical or mental *health limitation* (63% of group members – with 16% suffering from *severe* health issues and receiving sickness and disability benefits of EUR 4 833/year on average) and the possibility to draw on significant incomes that do not depend on own work effort (23%), which might weaken work *incentives*. Although 40% receive old-age benefits (EUR 6 288/year) these are not high compared to their potential earnings and are not expected to generate strong work disincentives.

Box 4.4. Group 4: "*Early retirees with health limitations, low education and long employment record*"

Main employment barriers	Selected characteristics	% of the target pop.
	- 60 years old (average) - Inactive - 41 years of paid work (average) - Former professions: craft, machine operators, elementary occupations - 7 years of schooling (average) - Average equivalised disposable income: EUR 7 760 (3rd quintile) - 2.1 simultaneous employment obstacles (average)	

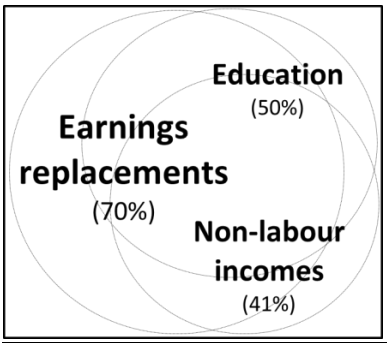
Group 5 (**9%** of the target population): **"*Long-term unemployed youth without any past work experience and scarce job opportunities*"**. This group is characterised by young (85%, average of 24 years) people who had been unemployed (78%) for most of the reference period, with 76% who were still seeking employment at the time of the interview. This group is likely to face three or more simultaneous employment obstacles, the second highest among all the groups (Figure 4.1). A major barrier is low professional skills, largely due to the fact that 70% do not have any *work experience*. Low skills levels and low *education* (53%) are likely to reduce employment possibilities and this helps to explain why all group members face also scarce *job opportunities*. Although 77% are unemployed, only 4% receive unemployment payments, and this put individuals under further financial strain. 74% live with their parents, 45% are at risk of poverty and 49% face material deprivations (with half of those being *severely deprived*).

Box 4.5. Group 5: "*Long-term unemployed youth without any past work experience and scarce job opportunities*"

Main employment barriers	Selected characteristics	% of the target pop.
	- 24 years old (average) - Unemployed - Length of unemployment spell: 12+ months (average) - No past work experience - 11.6 years of schooling (average) - At risk of poverty - Average equivalised disposable income: EUR 6 081 (1st quintile) - 3 simultaneous employment obstacles (average)	

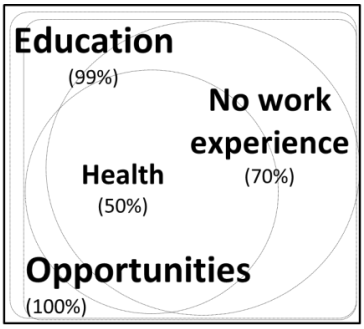
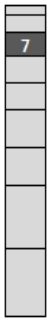
Group 6 (**9%** of the target population): ***"Early retirees with weak financial work incentives"***. Most people in this group (90%) are aged 55 or over (average age 61 years), and have 12.2 years of education on average (second highest educated group). They have lengthy paid work experience (37 years on average) and more than half (53%) have worked in occupations at "high" skill content such as technicians (17%), professionals (25%) or managers (10%). This group has the highest average equivalent disposable income of all the groups (EUR 15 741/year). The majority of group members are labour-market inactive (88%) with 80% reporting to be retired. 41% suffer from long-standing physical and mental *health limitations*, with 8% reporting a *severe* condition. Many of them (70%) are entitled to high levels of earnings replacements benefits compared to their potential earnings; 75% receive old age benefits (average amount of EUR 19 271/year) and 17% receive disability benefits (average amount EUR 9 737/year). 41% live in households with high levels of income from other sources, such as a partner's earnings or private pension. Both benefits and non-labour incomes could thus weaken financial *incentives* to undertake paid work.

Box 4.6. Group 6: "*Early retirees with weak financial work incentives*"

Main employment barriers	Selected characteristics	% of the target pop.
	- 61 years old (average) - Retired - 37 years of paid work - 12.2 years of schooling (average) - Average equivalised disposable income: EUR 15 741 (top quintile) - 2.1 simultaneous employment obstacles (average)	

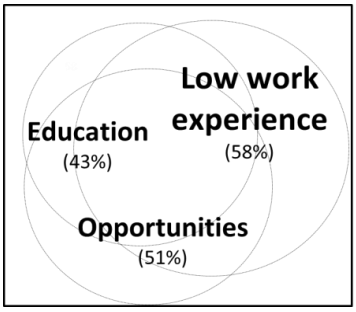
Group 7 (**7%** of the target population): "***Women with low education and without any past work experience***". This group consists of prime age (65%) women (80%) who are mostly inactive (62%). Most of this group face at least three simultaneous employment barriers (the highest of all groups – see Figure 4.1). All individuals in this group have low *education*, with 6.6 years of schooling on average (the lowest level of any group). 69% have no past *work experience* at all while the rest were employed in occupations at "low" skill content, such as machine operators or elementary occupations. The combination of low professional skills and low education are likely to reduce employment possibilities and this helps to explain why all group members also face scarce *job opportunities*. 53% suffer from long-standing physical and mental *health limitations*, with 17% reporting a *severe* condition. The group is the poorest of the nine groups, with 49% of individuals in the bottom quintile of the income distribution and 48% at risk of poverty. This is also the group with the largest proportion of individuals living in rural areas (38%).

Box 4.7. Group 7: "*Women with low education and without any past work experience*"

Main employment barriers	Selected characteristics	% of the target pop.
	- 49 years old (average) - Women - No past employment record - 6.6 years of schooling (average) - At risk of poverty - Average equivalised disposable income: EUR 5 854 (1st quintile) - 3.8 simultaneous employment barriers (average)	

Group 8 (**6%** of the target population): **"*Unemployed youth with limited work experience*".** Individuals in this group are mainly young (average age 26) and unemployed with an average unemployment spell of ten months. Of the 64% who were unemployed during the reference period 28% found a job by the time of the interview while the rest were still seeking employment. All group members have worked in the past (five years on average) but for 58% of them this *work experience* is low relative to their age. Within this group, 51% face also scarce *job opportunities* as a result of the high youth unemployment rate in Portugal, and this may explain why many (30%) are still actively seeking employment at the time of the interview. Low *education* represents a barrier to re-employment for 43% of group members.[13] 77% live in households with other working members, typically their parents, and 34% in households with high levels of income from other sources, such as parents or partner's earnings, which could weaken financial *incentives* to undertake paid work. The group has the second highest equivalent disposable income of all the groups (EUR 7 914/year on average) and the second lowest number of simultaneous barriers (two on average).

Box 4.8. Group 8: "*Unemployed youth with limited work experience*"

Main employment barriers	Selected characteristics	% of the target pop.
	- 26 years old (average) - Unemployed - Length of unemployment spell: 10 months (average) - 5 Years of paid work experience (average) - 13 years of schooling (average) - Average equivalised disposable income: EUR 7 914 (2nd quintile) - 2 simultaneous employment obstacles (average)	

Group 9 (**3%** of the target population): ***"Mothers with care responsibilities and limited work experience"***. Individuals in this group are prime age (81%) women living in families with young children and a working partner. Women in this group have in general one or two young children with the youngest being four years old. Most (66%) have *care responsibilities* and 54% receive family benefits (EUR 1 115/year, on average). All individuals have past *work experience* but for 72% of them this is low relative to their potential work experience based on age and education. The skill content of this past experience is also "low" as the majority were clerks (37%), crafts (16%) or employed with elementary occupations (26%). 53% also have low *education* with 36% having achieved only a primary education and 17% a lower secondary degree. 66% remained unemployed throughout the reference period while 33% were economically inactive reporting care duties.

13. The probability of re-employment in this group is strongly related to the education level. Among those who found a job by the time of the SILC interview 70% have a secondary degree or an upper-secondary degree (36% and 34%, respectively).

Box 4.9. Group 9: "*Mothers with care responsibilities and limited work experience*"

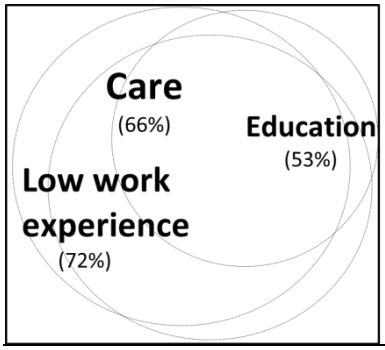
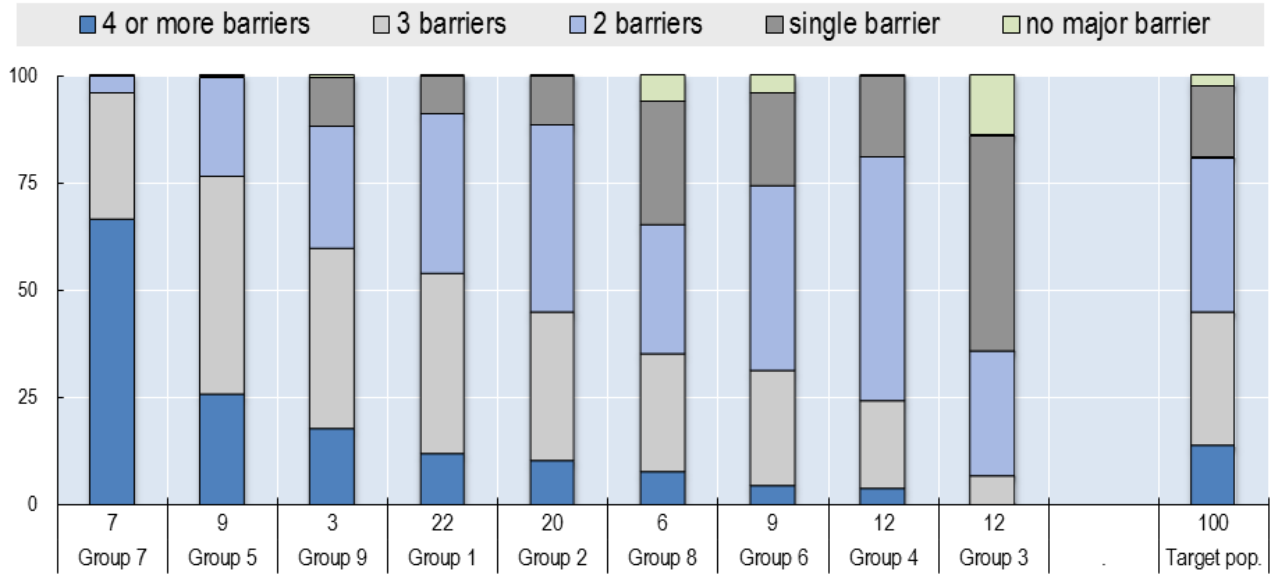
Main employment barriers	Selected characteristics	% of the target pop.
	- 38 years old (average) - Women - Couple with children - Unemployed/Inactive - 10 years of paid work experience (average) - 11.4 years of schooling (average) - Average equivalised disposable income: EUR 6 538 (3rd quintile) - 2.7 simultaneous employment obstacles (average)	

Figure 4.1. Share of individuals facing multiple employment barriers in each group

In descending order of shares facing at least three barriers; shares in %



Note: Group sizes are reported on the horizontal axis. See Box 2.1 to Box 2.9 for details. 1. "Older women with health limitations, low education and limited work experience". 2. "Prime-age long-term unemployed with low education and scarce job opportunities". 3. Underemployed workers with low education". 4. "Early retirees with health limitations, low education and long employment record". 5. "Long-term unemployed youth without any past work experience and scarce job opportunities". 6. "Early retirees with weak financial work incentives". 7. "Women with low education and without any past work experience". 8. "Unemployed youth with limited work experience". 9. "Mothers with care responsibilities and limited work experience".

Source: Calculations based on EU-SILC 2014.

5. CONCLUSIONS

This note has used a novel method for identifying, analysing and visualising the most common employment barrier profiles characterising the Portuguese population with potential labour market difficulties. The underlying premise is that out-of-work individuals (unemployed and inactive) and workers with weak labour market attachment face a number of possible employment obstacles, and each of them may call for different policy responses. The success of activation and employment-support policies (AESPs), and of social protection measures more generally, is expected to hinge on effective strategies to target and tailor policy interventions to these barriers and to individual circumstances.

The segmentation method used in this note has uncovered patterns that can provide concrete guidance for policy design and targeting strategies in Portugal. Results show that "short-hand" groupings that are often referred to in the policy debate, such as "youth", "women", "unemployed", are far from homogeneous, and may distract attention from the specific employment obstacles that policies seek to address. Indeed, some of these categories include several distinct sub-groups with very different combinations of employment barriers.

For example, the statistical clustering has identified three quite different groups of women that are likely to respond to policies in different ways. One group is characterised by limited work experience and no major barriers to employment other than the need to care for children. For this group training programmes and affordable childcare may represent the most effective policy mix. A larger group isolates older women who combine low education with health limitations. In this case active labour market policies to tackle skills deficits should go together with flexible work arrangements. A third group has no past work experience at all and very low levels of education. In this case a longer-term approach to addressing employment barriers may be necessary.

The statistical clustering has identified two groups of older people facing different employment barriers. Both have low education and a long employment record but one has health limitations, whereas the other lives in relatively rich households and receives high earnings replacement benefits. Again, these differences suggest scope for employing quite different policy approaches for different groups of older working-age people.

The statistical clustering has also identified two distinct sub-groups among the youth. Both are unemployed, one is trying to find a job for the first time and is facing scarce job opportunities while the other has some professional skills deficits but is slowly managing to return to paid work. In view of these different characteristics, a uniform approach regarding youth policies would likely be inappropriate.

Although the clustering results do not in themselves say which groups should be the focus for AESPs, they may highlight priority groups for policy interventions. For instance, very high poverty risks, a large number of young people or a strong over-representation of women in some groups may signal a need to review whether existing targeting strategies meet governments' social cohesion objectives. A high poverty risk combined with weak work incentives may call for caution in applying benefits recipient requirements (such as for some individuals in Group 3). By contrast, groups with relatively high incomes and financial disincentives caused by high levels of income replacement benefits (such as Group 6) may indicate scope for targeted benefit reductions or for tightening benefit eligibility conditions.

Likewise, information on the intensity and number of barriers faced by individuals can inform difficult policy decisions involving trade-offs between helping those in greatest need and targeting those who are likely to be the most responsive to policy interventions. For example, it is debatable whether resources should be channelled primarily to those with severe or multiple barriers who are, in some sense,

furthest from obtaining or holding a stable job or to groups with moderate employment difficulties, for whom policy interventions may have a greater probability of success.

A forthcoming Country Policy Paper to be produced as part of this project will take stock of existing policy measures for some of the groups identified here. Based on that policy inventory, it will seek to analyse whether they are well-aligned with the employment barriers identified in this paper.

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ANNEX A
LATENT CLASS RESULTS

Using the 2014 SILC data for Portugal, the segmentation algorithm outlined in Annex B leads to a model with **nine groups**. Table A.1 shows the estimated parameters, i.e. the *share* of individuals facing the employment barriers in each latent group and the related *group size* in the target population (first row). Groups are ordered by size; colour shadings are used to highlight barriers with higher (dark blue) and lower (light blue) frequencies in each group.

Table A.1. Latent class estimates

Percentage of individuals with selected characteristics, by group

		Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8	Group 9	Target Pop
	Group Size (Target population=100)	**22**	**20**	**12**	**12**	**9**	**9**	**7**	**6**	**3**	**100**
Core indicators	*"Low" education*	93	66	61	100	53	50	99	43	53	73
	No past work experience	0	0	0	0	70	0	69	0	0	11
	Positive but "low" relative work experience	58	20.3	6	0	29	1	16	58	72	27
	No recent work activity	94	72	7	80	100	96	100	17	100	74
	Health limitations	66	23	25	63	17	41	53	13	1	39
	Care responsabilities	8	5	3	4	5	2	13	4	66	7
	"High" non-labour income	27	20.0	29	23	31	41	28	34	34	28
	"High" earnings replacements	3	11	5	5	0	70	2	0	5	10
	Scarce job opportunities	2	99	1	14	100	1	100	51	35	43

Note: Section 3 describes the indicators and applicable thresholds. Group sizes refer to the target population as defined in Section 1. Colour shadings identify categories with high (dark blue) and lower (light blue) frequencies. Complementary categories (e.g. "high" skills) are omitted. Additional information on model selection and model specification is provided in Annex B.

Source: Authors' calculations based on EU-SILC 2014

Table A.2. Characterisation of the latent groups

Percentage of individuals with selected characteristics, by group

		Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8	Group 9	Target Pop
Number of individuals (% of the Target population)		22	20	12	12	9	9	7	6	3	100
Number of individuals (frequency, in thousands)		518	484	293	279	212	205	173	136	71	2372
Unstable jobs		3	28	33	7	1	3	0	62	0	15
Restricted working hours		3	0	23	5	0	0	0	10	0	5
Reason for restricted hours (% of)	No better job opportunities	..	..	73	..	..	..	..	81	..	68
	Housework or care responsabilities	..	..	7	..	..	..	..	0	..	7
	Other reasons	..	..	20	..	..	..	..	18	..	25
Zero or near-zero earnings		3	2	56	12	0	1	0	24	0	11
*Women**		78	42	52	45	47	39	80	46	99	56
*Age groups**	*Youth*	0	6	5	0	85	0	8	84	18	15
	Prime age	53	85	83	7	15	10	65	16	81	50
	Old-age	47	9	13	93	0	90	27	0	0	34
Age (average)		55	43	46	60	24	61	49	26	38	49
Main activity during the reference period	*Employed FT*	1	0	7	2	0	0	0	5	0	2
	Employed PT	3	0	19	4	0	0	0	12	0	4
	Self-employed FT	2	0	38	8	0	1	0	9	0	7
	Self-employed PT	1	0	9	2	0	1	0	2	0	2
	Unemployed	22	99	15	25	78	10	38	64	67	46
	Retired	26	0	3	44	0	80	0	0	1	18
	Unfit to work/disable	12	0	1	4	6	3	15	0	0	5
	Housework	32	0	2	7	7	2	44	2	30	13
	Other inactive	3	0	4	2	8	3	2	6	1	3
Activity at the time of interview	*Employed*	6	14	86	17	0	3	0	61	0	20
	Unemployed	21	85	7	23	77	9	38	36	66	40
	Inactive	73	2	7	61	23	88	62	3	34	40
Length of unemployment spell †		12+	12+	12	12+	12+	..	12+	10	12+	12.1
Actively seeking a job at the time of the interview		6	82	..	14	76	..	37	30	44	67

Table A.2. Characterisation of the latent groups *(cont.)*

Percentage of individuals with selected characteristics, by group

		Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8	Group 9	Target Pop
Number of individuals (%)		22	20	12	12	9	9	7	6	3	100
Level of education (ISCED)	Primary	76	41	42	84	28	35	81	18	36	54
	Lower secondary	16	25	19	16	26	15	17	25	17	20
	Upper secondary	5	21	21	0	32	23	1	33	34	16
	Tertiary	2	13	17	0	15	27	0	24	13	11
Years of education		7.6	10.9	11.1	7.0	11.6	12.2	6.6	13.0	11.4	9.8
Work-related skills (ISCO)	*No work-related skills*	0	0	0	0	70	0	68	0	0	11
	Elementar occupations	30	14	22	17	4	4	9	20	26	18
	Craft and machine operators	32	35	16	42	6	19	10	18	16	25
	Clerk and sales	31	30	29	29	14	24	11	38	37	27
	Technicians et al.	3	10	6	6	3	17	1	6	6	6
	Professionals	2	7	12	0	2	25	0	13	11	7
	Managers	3	4	13	6	0	10	0	5	4	5
Years of paid work experience †		22	21	26	41	4	37	19	5	10	24
Severe health limitations		20	5	6	16	3	8	17	3	0	10
Migrant		5	9	11	3	9	5	5	8	12	7
Equivalent disposable income (€/year - average)		7097	6867	6949	7760	6081	15741	5854	7914	6538	7705
Position in the income distribution	*Bottom quintile*	36	42	43	29	46	6	49	33	42	36
	Second quintile	25	21	20	24	23	8	23	26	20	22
	Third quintile	18	17	13	21	16	12	15	17	21	17
	Fourth quintile	13	12	12	17	9	23	9	11	11	13
	Top quintile	8	8	12	9	6	51	5	13	6	12
AROPE (eurostat methodology)		35	41	41	29	45	6	48	32	41	36
Material deprivation (Eurostat)	*No material deptivation*	63	59	72	66	51	89	52	67	59	64
	Deprived	18	22	17	19	21	7	27	17	25	19
	Severe	19	20	11	15	28	4	21	16	17	17
Benefits - Recipiens and average amounts (€/year)	*Sickness and disability recipients (%),*	23	3	8	17	4	17	18	2	3	12
	they receive, in average †	4250	..	4372	4833	..	9737	3340	..	..	4872
	Unemployment benefits recipients (%),	5	45	10	16	4	7	8	12	13	16
	they receive, in average †	4564	6204	5529	5163	..	..	..	..	..	5773
	Social Assistance recipients (%),	6	9	3	3	14	1	13	5	11	7
	they receive, in average †	2198	2397	..	..	3124	..	..	..	..	2552
	Housing Benefits recipients (%),	5	7	9	4	7	7	4	6	12	6
	they receive, in average †	154	157	194	..	..	..	..	..	..	174
	Family-related benefits recipients (%),	17	31	23	8	31	3	30	22	54	22
	they receive, in average †	928	906	1074	..	1174	..	944	837	1115	982
	Old-age Benefits recipients (%),	21	1	3	40	0	75	1	0	0	16
	they receive, in average †	5465	..	..	6288	..	19271	..	..	..	11227
Household type	*Single*	6	7	3	10	1	10	3	1	1	6
	Couple without children	34	20	22	45	12	46	25	15	10	28
	Couple with children	16	33	33	5	12	8	20	13	57	21
	2+ adults without children	29	21	23	31	38	28	29	46	11	28
	2+ adults with children	13	14	16	8	36	7	22	22	18	16
	Lone parents	2	4	2	1	1	2	2	1	4	2
*Have children**		15	36	29	8	30	5	23	21	66	23
Number of children †		1.7	1.4	1.5	..	1.8	..	1.7	1.4	1.6	1.5
Age of the youngest child †		6	6	5	..	4	..	5	5	4	5
*Live in rural area**		32	25	27	31	23	20	38	27	26	28
Household with other working household members		51	55	68	47	68	42	54	77	77	57
Number of simultaneous barriers		2.6	2.4	1.3	2.1	3.0	2.1	3.8	2.0	2.7	2.4

Note: Results based on weighted observations. Colour shadings identify categories with high (darker) frequencies. The average number of simultaneous barriers per individual is computed for the core indicators in Table A.1 with the exception of recent work experience. Income quintiles refer to the entire population. Poverty risks and material deprivation are calculated with the Eurostat methodology. "Length of unemployment spell" only covers reference period: unemployment spells that started before the start of the reference period are left-censored at the start of the reference period.

* The variable enters as an additional indicator in the latent class model. See Annex B for details.

† Average across observations with strictly positive values.

Source: Authors' calculations based on EU-SILC 2014.

Table A.3. Characterisation of the group with zero or near-zero earnings in Group 3

Panel A. Selected characteristics by main activity status during the reference period

	Main activity	Average earnings (€/year)*	*Strictly* positive earnings (%)	Average number working months	"Low" education (%)	At risk of Poverty (%)
Employed FT	13	942	84	12	46	33
Employed PT	4	632	28	11	73	67
Self-employed FT	69	673	94	12	66	55
Self-employed PT	12	661	88	12	71	53
Unemployed / inactive	1	…	…	4		5
Total	100	685	89			

Panel B. Distribution of group members by sector of activity

Wholesale and retail trade	23
Agriculture, hunting and forestry	15
Accommodation and food service	14
Construction	11
Real estate, professional, administrative activiti	9
Mining, manufacturing, electricity, water supply	8
Social work activities	5
Education	3
Financial and insurance activities	2
Transportation and storage	2
Information and communication	2
Public administration	1
Others	7

* Sub-group with strictly positive earnings.

Source: Authors' calculations based on EU-SILC 2014.

ANNEX B
LATENT CLASS ANALYSIS AND MODEL SELECTION

The segmentation method used in this note is *Latent Class Analysis* (LCA). This method exploits the interrelations of an array of indicators through a fully-specified (i.e. parametric) statistical model for organising the target population into homogeneous groups. In the present framework, the indicators represent employment barriers and the statistical algorithm therefore identifies population sub-groups sharing similar barriers to employment, e.g. "low skills *and* scarce job opportunities" for Group 1; "limited work experience *and* low financial work incentives" for Group 2, etc.

LCA has three main advantages relative to other common segmentation (or "clustering") methods: 1) Formal statistical tests guide the selection of the optimal number of groups and other model's features; 2) LCA does not allocate individuals into specific groups in a deterministic way but, instead, provides *probabilities* of group membership, thus reducing possible classification errors in any post-estimation analysis; 3) LCA deals easily with common data-related issues such as missing data and complex survey designs.

Latent Class Analysis does not automatically provide an estimate of the *optimal* number of latent classes. Instead, models with different number of classes are estimated sequentially and the optimal model is chosen based on a series of statistical criteria. To summarise, the model selection process starts with the definition of a *standard* latent-class model that is repeatedly estimated for an *increasing number of latent classes* (Step 1).[14] The choice of the *optimal* number of classes is primarily based on goodness-of-fit and error-classification statistics (Step 2, see also Figure B.1), and then on the analysis of potential misspecification issues (Step 3). Fernandez et al. (2016) describes these steps in details and provides guidelines for practitioners interested in adapting the approach to specific analytical needs or data.

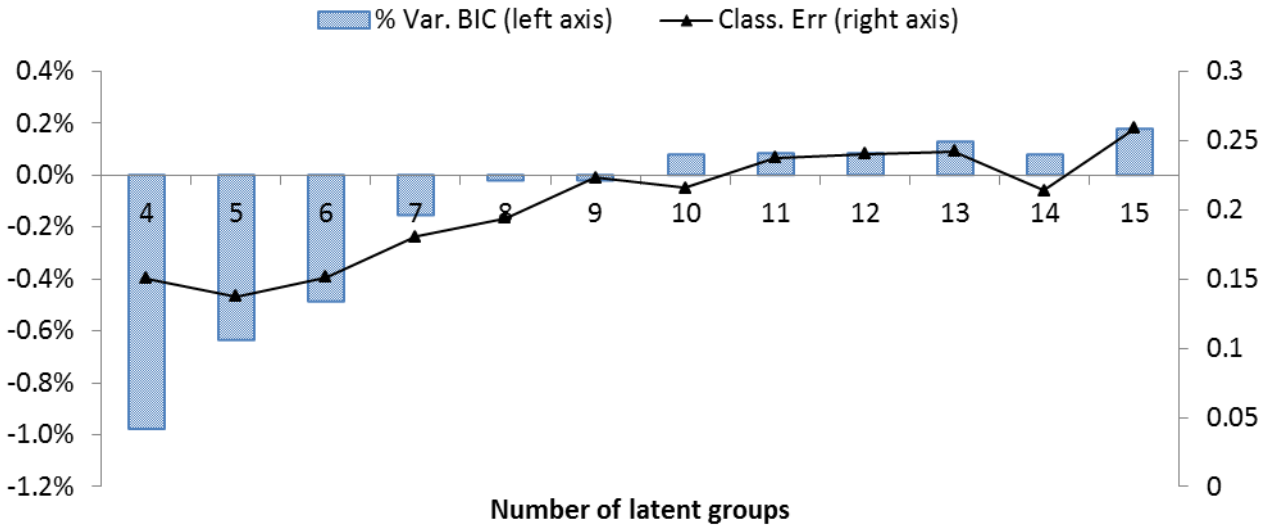
Figure B.1 summarises graphically Step 2 outlined above for the Portugal SILC 2014; The blue bars show the percentage variations of the *Bayesian Information Criterion* (BIC, Schwartz 1978)[15] for increasing numbers of latent groups, whereas the black line shows, for the same groups, the *classification error statistics* (Vermunt and Magdison, 2016).[16] In general, a smaller value of the BIC indicates a more optimal balance between model fit and parsimony, whereas a smaller value of the classification error statistics means that individuals are well-classified into one (and only one) group. In Figure B.1 the BIC is minimised for a model with 9 classes and the classification error of 22% indicates that the model provides a relatively good representation of the heterogeneity in the underlying data.

14. A *standard* latent class model means that the likelihood function is derived under the so-called Local Independence Assumption (LIA). See Fernandez et al. (2016) for details.

15. The BIC summarises into a single index the *trade-off* between the model's ability to fit the data and the model's parametrisation: a model with a higher number of latent classes always provide a better fitting of the underlying data but at the cost of complicating the model's structure.

16. The classification error shows how-well the model is able to *classify* individuals into specific groups. To understand the meaning of the classification error index it is important to keep in mind that LCA does not assign individuals to specific classes but, instead, estimates probabilities of class membership. One has therefore two options to analyses the results: allocate individuals into a given cluster based on the highest probability of class-membership (*modal* assignment) or *weighting* each person with the related class-membership probability in the analysis of each class (*proportional* assignment). The classification error statistics is based on the share of individuals that are miss-classified according to the modal assignment.

Figure B.1. Selection of the optimal number of latent classes



Post-estimation tests based on the *Bivariate Residuals* (Vermunt and Magdison, 2005) show for the 9-class model some residual *within-group* correlation between 4 pairs of indicators. This indicates that the model violates to some extent the Local Independence Assumption (LIA).[17] Increasing the number of latent classes always reduces the residual dependencies between indicators. For instance, the 13-class model shows no signs of local dependencies, but this comes at the cost of a higher classification error (25%).

Following Fernandez et al. (2016) and Vermunt and Magdison (2005) the residual dependencies between indicators is addressed with the so-called *direct effects*; these are ad-hoc terms that enter the specification of the likelihood function to model explicitly the *joint* probabilities of pairs of indicators conditional on group membership. The inclusion of direct effects eliminates any residual correlation between the relevant pair of indicators but it also requires repeating the model selection process, as the new baseline model with local dependencies may lead to a different optimal number of classes. For the new baseline model with direct effects the BIC still points to the 9-class solution, which therefore remains the favourite option.[18]

17. The LIA shapes the algebraic specification of the model and, in practice, requires the indicators to be *pairwise* independent *within* latent groups. Bivariate residuals are Pearson chi-squared tests comparing the *observed* associations between pairs of indicators with the *expected* association under the assumption of *local independence*; large differences between estimated and observed associations signal violations of the LIA.

18. Age, gender and regional differences define labour market segments that are worth including in the latent class model to account for differences between and within these groups. Fernandez et al. (2016) discusses three possibilities for including additional variables in the model's specification. In SILC-2014 for Portugal the favoured specification in terms of lower classification error, interpretation of the results and specification tests includes age and gender differences directly in the classification model while regional differences (degree of urbanisation) enter as active covariates. Figure B.1 is based on a model that already considers information on age (three categories: 18-29, 30-54, 55-64), gender and degree of urbanisation (three categories).