

The return to recognition of prior learning:
An analysis of the Portuguese case

Francesca Sgobbi

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The return to recognition of prior learning: An analysis of the Portuguese case

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The return to recognition of prior learning: An analysis of the Portuguese case¹

Abstract

In the first decade of this century subsequent Portuguese governments promoted two large programmes (RVCC Centres, 2001-2005, and Novas Oportunidades, 2006-2010) aimed at improving the educational qualifications of the adult population by means of an extended network of centres in charge of appraising prior and experiential learning. Based on the Quadros de Pessoal survey this paper assesses the wage return to the recognition of prior learning promoted by the RVCC Centres and the Novas Oportunidades programmes by means of DID-PSM estimates. The outcomes of the empirical analysis outline non-negative wage effects from participation in recognition of prior learning compared to traditional formal adult education. However, the path undertaken to upgrade individual qualification matters. Participation in recognition of prior learning under the RVCC Centres initiative resulted in no significant wage increases compared to formal adult education, whereas differentials became mostly positive and statistically significant under the Novas Oportunidades programme.

Keywords – Adult learning; Recognition of prior learning; Wages; DID-PSM; Quadros de Pessoal

JEL classification – I26 (Returns to Education), J31 (Wage Differentials)

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DINÂMIA'CET – Iscte, Centro de Estudos sobre a Mudança Socioeconómica e o Território
Iscte- do Instituto Universitário de Lisboa
Sala 2W4 - D | ISCTE-IUL – Av. das Forças Armadas
1649-026 Lisboa, PORTUGAL
Tel. (+351) 210 464 031 / 210 464 197 | E-mail: dinamia@iscte-iul.pt | www.dinamiacet.iscte-iul.pt

1. INTRODUCTION

An educated labour force is increasingly perceived as a crucial resource to support knowledge-intensive and technology-intensive economic growth in post-industrial countries. The growing importance attached to individual skills and competences goes along with the emphasis on the continuous enlargement and deepening of the capabilities needed to meet change in job requirements. The resulting switch from a clear-cut separation between education and working life to an overlapping of educational and training experiences centred on the concept of lifelong learning (CEC, 2000) involves noteworthy consequences. First, formal education becomes one opportunity in a range of multiple learning sources that also include non-formal learning and informal learning². Second, adult education (including both formal, non-formal, and informal learning) turns into a viable and effective means to improve the skills and competences of individuals also after schooling years (Colardyn and Bjornalvold, 2004).

Given the wider share of adult education opportunities that occur in the form of non-formal and informal learning compared to formal learning governments and institutions have been devoting increasing efforts to provide visibility to those types of learning by means of recognition, assessment, and validation processes (CEC, 2000; European Commission, 2015). Recognition of prior learning (RPL), also labelled as prior informal learning or experiential learning record, allows for the accreditation of new formal qualifications that certify the accumulation of additional human capital (Becker, 1964) by means of non-formal and informal learning processes and can be conveniently signalled in the labour market (Spence, 1973).

Adult education is expected to provide significant individual and collective benefits by reducing social inequalities that may arise from lack of educational opportunities or school failure in youth and early adulthood (Singh, 2005; Handa *et al.*, 2009; Hällsten, 2012), as well as by supporting the competitiveness of knowledge-based economic systems (CEC, 2000; European Commission, 2015). However, existing evidence is still scarce and sometimes contradictory. Formal adult education displays a positive impact on employment rates (Hällsten, 2012), on the likelihood of being in non-precarious employment, conditional on the flexibility of local labour markets (Vono de Vilhena *et al.*, 2016), and on the probability of undertaking additional lifelong learning (Jenkins *et al.*, 2003). When it comes to earnings, Jenkins *et al.* (2003) show no

² Formal learning, which typically targets the achievement of a new educational or professional qualification, results from a set of structured and planned activities explicitly aimed at learning. Non-formal learning occurs within planned activities that allow for intentional learning by participants despite not being explicitly designed for education or training purposes. Informal learning, or experiential learning, results from all types of daily activities and is not driven by learner's intentionality (Colardyn and Bjornalvold, 2004).

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significant returns to late investments in formal education, whereas Hällsten (2012) reports significant but small returns, Blanden *et al.* (2012) find significant advantages for women only, and Park (2011) relates a substantial average increase in real hourly wage rate of 8.6% per additional year of schooling, which raises with the initial education level. Based on Swedish data Stenberg (2011) questions the profitability of adult education targeted at primary and secondary qualifications by showing that private returns barely cover private and social costs. Evidence is even less clear in the case of returns to prior learning. With the notable exception of Lima (2012), the studies that explore the benefits of RPL offer qualitative evidence based on case studies that does not allow for generalisation of results (Peruniak and Powell, 2007; Stenlund, 2010; Carneiro, 2011; Lima and Guimaraes, 2016).

The Portuguese case provides a unique opportunity for a new assessment of the wage effects of RPL. The interest of the Portuguese case descends from at least two peculiarities. First, in the first decade of this century Portugal underwent two large-scale programmes centred on adult education and RPL. Subsequent governments supported a range of initiatives aimed at improving the educational qualifications of the resident adult population up to secondary certifications by means of formal adult learning, validation and certification of individual competences, and accomplishment of education curricula interrupted by younger adults. Second, the longitudinal archive Quadros de Pessoal (QdP), which collects data on employees and their employers in the Portuguese private sector on yearly bases, provides the opportunity to assess the returns to RPL by tracking the evolution of individual educational qualifications in connection with labour market outcomes.

Based on propensity score matching with difference-in-differences estimates (DID-PSM) on QdP linked employer-employee data this paper looks for systematic differences in earnings increase between employees who upgraded their educational qualification up to secondary education thanks to RPL and a control group of upgraders who followed traditional paths of formal adult education before the launch of the RPL initiatives. The efficacy of the RPL efforts enacted by the Portuguese governments after 2000 is tested separately for the early initiative launched between 2001 and 2005, named RVCC Centres³, and the following Novas Oportunidades (*i.e.*, “New Opportunities”) programme, which developed between 2006 and 2010. Thanks to focus on lower education levels this analysis fills up a gap in the literature on the

³ RVCC is the acronym for *Reconhecimento, Validação e Certificação de Competências* (Recognition, Validation and Certification of Competences).

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economic returns to adult education, which mainly focuses on mature graduates from tertiary education⁴.

Both RVCC Centres and Novas Oportunidades elicited significant participation from potential candidates (ANQ, 2010). The DID-PSM estimates developed in this paper outline non-negative wage effects from participation in RPL compared to traditional formal adult education. However, the path undertaken to upgrade individual qualification matters. Participation in recognition of prior learning under the RVCC Centres initiative resulted in no significant wage increases compared to formal adult education, whereas differentials became mostly positive and statistically significant under the Novas Oportunidades programme.

The rest of the paper is organised as follows. The next section presents the Portuguese initiatives in support of adult education and RPL and discusses the available evidence on their outcomes. Section 3 provides information on Quadros de Pessoal, the dataset used in the empirical analysis, and describes the recent evolution of educational qualifications in the Portuguese labour market. Section 4 details the empirical strategy adopted to assess earnings increase for participants in RPL, whose results are presented in section 5. The final section discusses the paper outcomes and outlines some concluding remarks.

2. RECOGNITION OF PRIOR LEARNING: THE PORTUGUESE EXPERIENCE

Recent research suggests that the evolution of the Portuguese public policies in support of adult education mirrors the parallel developments in the approach towards lifelong learning by Western countries in general and by EU countries in particular (Fragoso and Guimaraes, 2010; Guimaraes, 2012; Lima and Guimaraes, 2016). UNESCO first developed the concept of lifelong learning in the 1970s as a tool in support of democracy. Adult education and lifelong learning were meant to complement inclusive education systems in promoting a social, political, and civic emancipation based on adult participation and rooted in problems and needs directly experienced by learners. However, the diffusion of neoliberalism and globalisation progressively switched the perception of lifelong learning from a means of social inclusion to a source of economic growth. By increasing the flexibility of citizens and workers adult education and lifelong learning could reinforce economic performance and improve individual labour market outcomes in a mutable and increasingly competitive work environment. This change in the perception of lifelong

⁴ See, *e.g.*, Jepsen and Montgomery (2012) for the US; Hällsten (2012) for Sweden; Kilpi-Jakonen *et al.*, (2012) for a comparison between the UK, Spain, Sweden, and Russia. For an exception focused on primary and secondary education, see Jenkins *et al.* (2003).

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learning brought in a shift from a collective to a private focus also in the role played by the actors of adult education processes. On the one hand learners had to take the risk of designing their own educational and training trajectory, which might not fit with market demand. On the other hand, private profit-seeking partners could complement public organisations in providing and assessing educational contents. The interplay between market-driven demand for skills and the provision of adult education services by public and private actors involved significant consequences also for the organisation of recognition, assessment, and validation of prior learning⁵. A growing emphasis on the efficiency of the RPL process progressively shifted the attention from learning paths to certification processes, with an increasing stress on standards, routines, and performance indicators. The adoption of proper benchmarks and indicators was consequently regarded as a necessary step to develop high quality systems for the accreditation of prior and experiential learning.

The above described shift from an emancipation-oriented to a market-oriented approach to lifelong learning and adult education clearly reflects in the evolution of adult education policies in Portugal after the 1974 revolution (Guimaraães, 2012; Lima and Guimaraães, 2016), when the new democracy had to face an illiteracy rate among adult population that still rounded 25%. If the early years were marked by bottom-up adult education policies focused on social and political emancipation, entry in the former European Community (EC) in 1986 soon turned the attention to the opportunity of leveraging on adult education to promote the modernisation of the country. The consequent emphasis on formal education programs was strongly encouraged by EC-funded adult education initiatives.

The high dependence of Portuguese support programmes on EU funds also justifies compliance with the further evolution of adult education policies centred on market-driven lifelong learning adopted by the EU at the turn of the century (CEC, 2000; European Commission, 2015). It is within this framework that in 1999 the Portuguese government established a new public agency, ANEFA (National Agency for Adult Education and Training), to coordinate and implement a new set of adult education policy programmes revolving around two main tools⁶. These included a network of national centres for the recognition, validation, and certification of competences (RVCC centres) and the promotion of formal education initiatives for individuals at

⁵ For instance, CEC (2000) reports that “The rising demand for qualified labour by employers and increased competition between individuals to gain and keep employment is leading to much higher demand for recognised learning than ever before” (p. 15).

⁶ Information on the evolution of Portuguese programmes in support of adult education is based on CIDE (2004), INE (2008), ANQ (2010), Carneiro (2010), Frago and Guimaraães (2010), Guimaraães (2012), Lima (2012), Barros (2013), and Lima and Guimaraães (2016).

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risk of social exclusion, the EFA courses (Adult Education and Training courses). The national network of the RVCC centres managed RPL processes targeted at individuals above the age of 18 and focused on basic education levels and the corresponding qualifications (either four, six, or nine years of formal education). The RPL process could include up to 25 hours of further education for applicants who displayed significant gaps in any of the four key competence areas considered in the assessment process (Citizenship and employability, Information and communication technologies, Language and communication, and Maths for life). After the opening of the first six centres in 2001 the network of the RVCC centres rapidly expanded and by the end of 2005 the number of RVCC centres amounted to 98. This fast enlargement leveraged on involving already existing organisations active in adult education and social intervention.

At the end of 2005 a political change brought in a revival of adult education initiatives with the launch of a new, more ambitious programme called *Novas Oportunidades*, which also involved the creation of a new agency in charge of qualification processes (Agência Nacional para a Qualificação, ANQ). The New Opportunities initiative focused on the certification of competences corresponding to both basic and secondary education (up to the 12th grade of Portuguese curricula) as well as on encouraging young school leavers to complete interrupted education programmes. Certification of prior learning processes could include up to 50 hours of formal education to fill up gaps in key competence areas, with possible direction to formal programs of adult education for applicants displaying more severe gaps. The network of the national RVCC centres, now called New Opportunity centres, further grew from 270 units in 2006 to 454 in 2010, thanks to collaboration with regular secondary schools. In addition, a media campaign was launched to raise citizens' awareness about new education and certification opportunities⁷.

The large effort devoted to adult education by the RVCC Centres and the *Novas Oportunidades* initiatives encouraged strong participation by citizens. Between 2001 and 2005 153,719 people enrolled in a certification or an education programme at an RVCC centre and 44,192 new certifications occurred. In the following five years, between 2006 and 2010, the same figures multiplied to 934,597 and 328,263, respectively. In addition, 15,305 candidates obtained a certification after completing an EFA course between 2001 and 2005 and 45,452 additional certifications were released between 2006 and 2010 (ANQ, 2010). On the whole, over one million people enrolled in a qualification programme between 2006 and 2010 and over 400,000

⁷ A political turnaround and the severe economic crisis undergone by Portugal in 2011 cut the resources available for the *Novas Oportunidades* initiative after 2010. *Novas Oportunidades* Centres definitively closed at the end of March 2013, substituted by new Centres for Qualification and Vocational Training.

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participants obtained a new educational qualification in a population that in the same period counted slightly more than 7 million residents in the 18-64 age group.

Nevertheless, despite the incontrovertible numerical success, judgement of these programmes outcomes is still controversial. Most empirical analyses agree that participation in RVCC Centres and Novas Oportunidades involved more than a mere certification process and led to significant skills improvement, especially in the areas of literacy, ICT use, “learning to learn” skills and soft skills (Valente *et al.*, 2009). Participation in a self-assessment process increased applicants’ self-esteem and self-confidence and fuelled their motivation to join in further education and training activities (Valente *et al.*, 2009; CIDEDEC, 2007; Carneiro, 2010; Lima and Guimaraes, 2016). In many cases higher educational certificates allowed for vocational training opportunities previously forbidden due to insufficient formal qualifications and significantly rose unemployed participants’ confidence in better future work opportunities by increasing their employability awareness (Lima and Guimaraes, 2016). In a sample of certified individuals 32% of interviewees reported a positive impact of Novas Oportunidades on their working life (Carneiro, 2010). However, these benefits remained mainly restricted to the personal sphere and involved limited improvement in career prospects. Participants reported no substantial change in their professional status due to the acquisition of a new qualification, whereas employers of newly certified workers related at most limited improvement in their employees’ performance (Valente *et al.*, 2009; Lima and Guimaraes, 2016).

Two studies by CIDEDEC (2007) and Lima (2012) provide quantitative analyses of the employability and the return to education upgrade for RVCC Centres and Novas Oportunidades, respectively. Based on a questionnaire administered to individuals who completed an RPL process in 2003 CIDEDEC (2007) reports growing employment rates among participants six months after achieving a higher qualification and a positive impact on employability⁸. A negligible share of upgraders in employment report a decline in their rewards, whereas about 10% declare substantial increase, with a peak of 30% among participants with initial earnings below the national minimum wage. The positive picture outlined by CIDEDEC (2007) contrasts with the negative outcomes of participation in RPL suggested by Lima (2012). Based on doubly robust estimators applied to administrative data this study compares participants in Novas Oportunidades RPL process with residents in Portugal between 2007 and 2011. According to Lima (2012), a higher qualification improves the probability to switch from unemployment to employment only

⁸ 41.6% of participants unemployed at enrolment in RPL and 19.3% of participants initially outside the labour market reported to be in employment one year after the education upgrade.

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when involving vocational qualifications or vocational training, whereas the economic return to RPL is either non-significant or involves a small wage penalty for RPL upgraders compared to non-participants. This study underlines the importance of contrasting the outcomes achieved by participants in RPL with the outcomes of a reference group to appreciate the actual effectiveness of an incentive programme. However, estimated differentials may suffer from the mixed nature of the control group, which includes both individuals who did not change their qualification in the observed period and upgraders by means of traditional formal adult education courses, an adult education channel which continued to attract large numbers of participants also after the enforcement of the examined RPL initiatives (GEPE, 2009 and 2011). Accordingly, new evidence could be achieved by means of a clearer identification of the treatment and the control group.

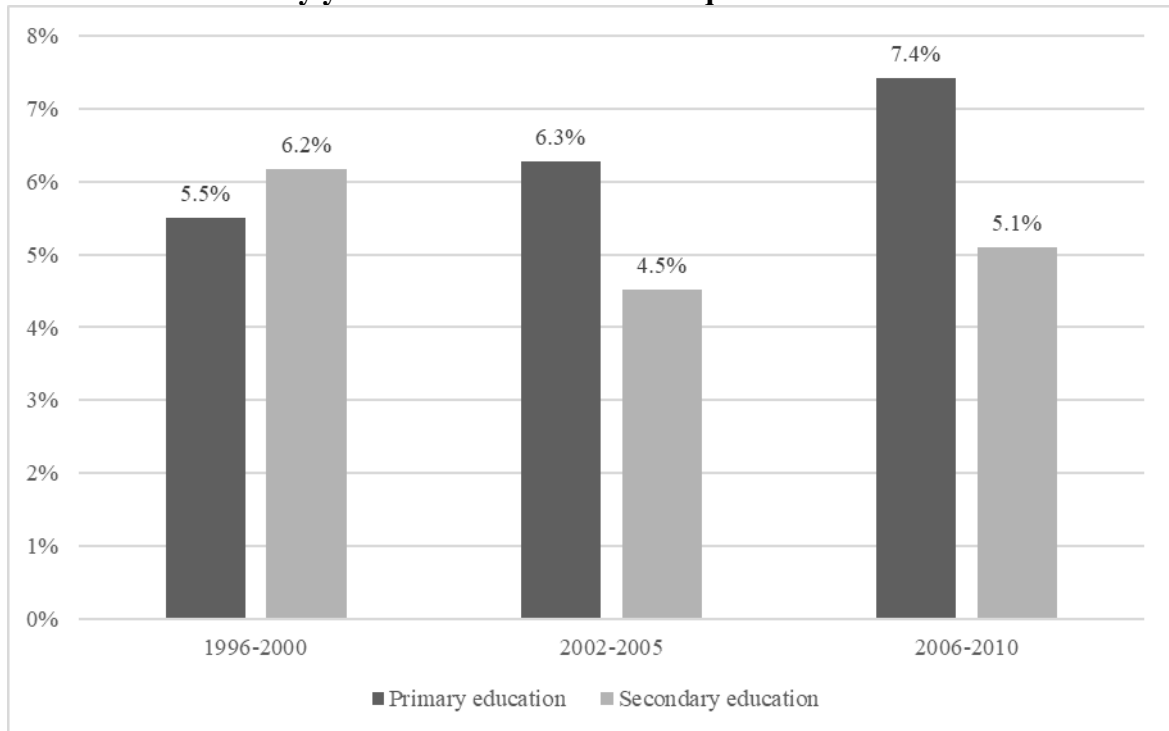
3. DATA

An opportunity to assess the return to investment in RPL in Portugal is provided by Quadros de Pessoal (QdP), a longitudinal dataset that includes the population of Portuguese firms with at least one wage earner and their employees in private sectors. Thanks to unique employer and employee codes, QdP allows for employer-employee matching and for tracking of employees' careers across subsequent employers. Data are collected annually by the Portuguese Ministry of Employment in the month of October (Cardoso and Portela, 2009) and participation is compulsory for manufacturing and services firms, whereas participation by employers in the primary sector is optional. Compared to other administrative datasets QdP offers the important advantage of reporting employees' educational qualification, besides standard information on employees, their occupations, and their employers. Accordingly, QdP allows for the identification of education upgrades among the employees of private sector firms in Portugal.

Given the focus of the RVCC Centres and the Novas Oportunidades initiatives the empirical analysis accounts for upgrades to basic education titles (which in the Portuguese education system include a 4th grade, a 6th grade, and a 9th grade certificate) and, in the case of Novas Oportunidades, also for upgrades to secondary education certificates, which correspond to 12 years of formal education. Figure 1 reports the share of educational upgrades by year and by final level of education registered in QdP in two subsequent years between 1996 and 2010.

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Figure 1. Percentage of education upgraders on the Portuguese workforce by year of transition and final qualification



Source: Elaboration on QdP data. Private sector employment, agriculture excluded. Changes in education levels in 2001 relative to 2000 and in 2002 relative to 2001 missing due to missing observations in QdP for year 2001.

Data in Figure 1 suggest a positive impact of the new millennium adult education programmes on the qualifications of employees in Portugal. Compared to the baseline period of 1996-2000 the share of upgraders consistently grew up in 2002-2005 and in 2006-2010 among the holders of basic education certificates. In a similar way the launch of the Novas Oportunidades initiative in 2006 revived participation in adult education by seekers of a secondary education certificate. Irrespective of qualification levels in all the examined periods the share of upgraders to primary and secondary education per year rounds and in most cases overcomes a sizable 5% of total workforce, the same level calculated by Blanden *et al.* (2012) for the UK.

4. EMPIRICAL STRATEGY

Thanks to information on employees' educational qualification and to the longitudinal nature of the underlying survey, QdP allows measuring the increase in earnings due to participation in a specific support initiative, such as a programme to encourage the upgrade of educational qualification, compared to a suitable control group of non-participants. In a standard difference-in-differences (DID) setting the relationship between participation in a treatment, denoted by an indicator d_i that takes value one for involved individuals and zero otherwise, and an outcome variable of interest y_{it} , measured before and after possible participation in treatment, is usually described by the following relationship:

$$y_{it} = \beta + \alpha_i d_i t + u_{it} = \beta + \alpha_i d_i t + n_i + m_t \quad (1)$$

where t is a time indicator that takes values zero and one in pre-treatment and post-treatment observation periods, respectively, whereas α_i is the impact of the treatment on treated individuals. Under the hypothesis that selection on unobservables does not depend on transitory individual-specific effects⁹ the error term u_{it} can be rewritten as the sum of an unobservable individual-fixed effect n_i and an aggregate time-dependent macro-shock m_t . Conditional on d_i and t , the expected outcome y_{it} can be rewritten as

$$E[y_{it}|d_i, t] = \begin{cases} \beta + E[\alpha_i|d_i = 1] + E[n_i|d_i = 1] + (m_t|t = 1) & \text{if } d_i=1 \text{ and } t=1 \\ \beta + E[n_i|d_i = 1] + m_t & \text{otherwise} \end{cases} \quad (2)$$

The average value of the treatment effect for treated individuals (the so-called average treatment on the treated, ATT) can be calculated by double differentiating the outcome variable of interest across treated and untreated individuals and across time, thus sterilising the effect of non-time variant unobservables and time trends unrelated with the treatment (Blundell and Costa Dias, 2009):

$$\begin{aligned} E[\alpha_i|d_i = 1, t = 1] &= \hat{a}^{DID} = \\ &= [E(y_{it}|d_i = 1, t = 1) - E(y_{it}|d_i = 1, t = 0)] + \\ &- [E(y_{it}|d_i = 0, t = 1) - E(y_{it}|d_i = 0, t = 0)] \end{aligned} \quad (3)$$

Unfortunately, a standard DID approach is not suitable to appraise the return to RPL with QdP, because this dataset provides no information on the origin of reported education upgrades, which in the years covered by RVCC Centres and Novas Oportunidades could stem from either traditional formal adult education or RPL. A solution to identify the impact of the examined programmes on participants' earnings is based on reframing the empirical analysis as a

⁹ This hypothesis implies that the expected value of the error term does not depend on treatment:

$$\begin{aligned} E[(u_{it}|d = 1, t = 1) - (u_{it}|d = 1, t = 0)] &= E[(u_{it}|d = 0, t = 1) - (u_{it}|d = 0, t = 0)] \\ &= E[(u_{it}|t = 1) - (u_{it}|t = 0)] \end{aligned}$$

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randomised experiment with one-sided noncompliance (Blundell and Costa Dias, 2009; Imbens and Rubin, 2015, chapter 23). The proposed approach focuses on employees who report an upgrade in education and exploits variation in supportive policies across different time windows to disentangle exposure to treatment from actual participation in treatment. Treatment d_i is thus identified by participation in adult education (either RPL or formal adult education) in a period when a support policy is enforced. An outcome variable of interest y_{it} is observed before ($t=0$) and after ($t=1$) change in educational qualification for all upgraders, both in the treatment period ($d_i=1$) and in the baseline period when no RPL programme is available ($d_i=0$).

Noncompliance arises from the non-compulsory nature of education upgrade by means of RPL. Whereas some individuals choose to participate in RPL others may refrain from it, for instance by enrolling in a formal adult education course. The examined case of noncompliance is one-sided because only individuals assigned to treatment (i.e., upgraders during the enforcement of a support policy) have the opportunity to reject it, whereas upgraders in the control group can participate only in formal adult education.

Accordingly, a conditional variable z_i can be introduced for treated individuals to discriminate between compliers ($z_i=1|d_i=1$) and noncompliers ($z_i=0|d_i=1$). Under one-sided noncompliance the \hat{a}^{DID} parameter in equation (3) estimates the effect of being assigned to the treatment (the so-called intention-to-treat effect), but not the actual treatment effect, because the measured \hat{a}^{DID} averages the gains of upgraders attracted by the new policy enforced in the treatment period and the gains achieved by participants in formal adult education in the treatment period. If we denote by p_c the share of compliers among the treated the intention-to-treat effect can be split into two components:

$$\begin{aligned} \hat{a}^{DID} = & p_c * [E(y_{it}|d_i = 1, w_i = 1, t = 1) - E(y_{it}|d_i = 1, w_i = 1, t = 0)] + \\ & + (1 - p_c) \\ & * [E(y_{it}|d_i = 1, w_i = 0, t = 1) - E(y_{it}|d_i = 1, w_i = 0, t = 0)] \end{aligned} \quad (4)$$

The differential $[E(y_{it}|d_i = 1, w_i = 1, t = 1) - E(y_{it}|d_i = 1, w_i = 1, t = 0)]$ appraises the treatment effect on compliers, the so-called complier average causal effect (CACE), whereas the differential $[E(y_{it}|d_i = 1, w_i = 0, t = 1) - E(y_{it}|d_i = 1, w_i = 0, t = 0)]$ identifies the noncompliers average causal effect (NACE).

Based on (4) the estimate of the CACE thus requires information on both the proportion of compliers in the treatment group and the NACE. The latter is identified under the exclusion restriction, which assumes no assignment effect for noncompliers. In other words, the exclusion restriction implies that, in the absence of treatment-related time trends, noncompliers in the

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treatment groups would experience the same gain in output as individuals in the control group. Under the exclusion restriction $NACE=0$ and

$$CACE = \frac{\hat{a}^{DID}}{p_c} \quad (5)$$

The proposed identification strategy relies on two strong hypotheses. The first one concerns randomised assignment to the treatment and the control group. To meet this condition the DID approach is complemented by propensity score matching (PSM). In the DID-PSM approach the use of a matching algorithm to compare treated and untreated individuals rules out non-random differences in the distribution of initial characteristics that affect the probability of selection into treatment, whereas DID accounts for time-invariant unobserved heterogeneity and time trends unrelated with the treatment (Blundell and Costa Dias, 2009; Imbens and Wooldridge, 2009). Using the propensity scores derived from a logit estimate of the probability to participate in the treatment (Rosenbaum and Rubin, 1983), the chosen PSM algorithm matches treated observations with control observations based on an epanechnikov kernel density function (Villa, 2016). The kernel density function provides a consistent estimator of the counterfactual outcome of each treated observation by calculating a weighted average of all controls where weights are inversely proportional to the distance between the propensity score of the treated observation and those of all controls (Becker and Ichino, 2002).

The second hypothesis underlying the identification strategy concerns the validity of the exclusion restriction, which cannot be tested empirically. In the proposed empirical setting the members of the treatment and the control group upgrade the educational qualification in different periods. Accordingly, changes in economic or institutional conditions that potentially impact the wage gain of education upgraders may seriously question the hypothesis of no difference between the output of noncompliant treated individuals and members of the control group. The longitudinal nature of QdP and the time lag required by the examined RPL programmes to display their full potential provide a solution to check the suitability of the exclusion restriction. Non-statistical differences between the wage premium of upgraders in the baseline period and upgraders in the early years of RPL programmes, when education upgrades via formal adult education still largely prevailed (i.e., $p_c \cong 0$), would signal lower risks of violating the exclusion restriction.

5. ESTIMATE OF WAGE DIFFERENTIALS

5.1. Identification of treatment and control groups

The DID-PSM strategy with one-sided compliance outlined in the above section was applied to test the efficacy of the RPL efforts enacted by Portuguese governments after 2000 by means of two separate analyses. The first analysis focuses on upgraders during the initial development of the RVCC centres network, targeted at basic education certificates. The second analysis focuses on the Novas Oportunidades programme and the further expansion of the centres network, which extended RPL processes to the assessment of secondary education skills. In both cases the outcome variable of interest is the natural logarithm of the gross hourly wage observed before and after an education upgrade and the control group includes employees who upgraded their educational qualification in a baseline period that preceded the launch of the initiatives in favour of RPL.

The literature suggests that an upgrade in the education title of individuals in employment or self-employment has no immediate effect on earnings, whereas both the meta-analysis by Card *et al.* (2010) and the empirical study by Blanden *et al.* (2012) show positive returns two or more years after the achievement of a new qualification. To allow for the full unfolding of the returns to investment in adult education the earnings of employees in QdP are observed at the extremes of a three-year window that starts one year before an education upgrade is reported in QdP¹⁰ and ends two years after this occurrence.

The choice of which three-year windows characterise the baseline period before the launch of an RPL initiative is crucial to minimise the risk of violating the exclusion restriction. Since a gap in the QdP series in 2001 forces to exclude time windows starting in 1998, 2000, and 2001 due to uncomplete observation in all relevant years, the time window starting in 1999 and accounting for education upgrades between November 1999 and October 2000 was chosen as the baseline to compare the outcomes of upgraders to basic education titles under the RVCC Centres programme and the Novas Oportunidades programme. In the case of secondary education certificates, the baseline to assess upgraders' gains under the Novas Oportunidades initiative is provided by time windows beginning in 2003 and 2004, which record the gains of a control group immediately preceding the launch of the RPL programme.

¹⁰ QdP data refer to the month of October of each year. Consequently, an educational upgrade observed between year t-1 and year t will take place between November of year t-1 and October of year t.

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In both cases the acceptability of the exclusion restriction was tested by comparing the average increase in the hourly wage experienced by the control group with the wage gain achieved by upgraders in the early years of the corresponding RPL initiative, namely the time window starting in 2002 for basic education certificates and the time windows starting in 2005 and 2006 for secondary education certificates. We can safely assume that in these time windows upgraders still largely consisted of employees who improved their education by means of formal adult education courses¹¹. The non-significant outcome of DID and DID-PSM estimates confirm the similarity of the output gains experienced by the members of the control group and non-compliers in the treatment group (*i.e.*, participants in formal adult education after the enforcement of an RPL programme) and support the acceptability of the exclusion restriction¹².

In summary, the treatment groups to compare with the control groups identified in the above paragraphs include upgraders to basic education certificates under the RVCC Centres programme in the time windows starting in 2003 and 2004; upgraders to basic education certificates under the Novas Oportunidades programme in the time windows starting in 2006 and 2007; and upgraders to secondary education under the Novas Oportunidades programme in the time window starting in 2007. Time windows included in the second treatment period were upwards limited by the desire to exclude possible biases due to the Great Recession, whose effects on wages and employment levels became particularly visible after 2011, when Portugal entered an economic and financial assistance programme jointly run by the European Union, the European Central Bank, and the International Monetary Fund (Correia, 2016; Blanchard and Portugal, 2017).

The identification of treatment windows under the RVCC Centres and the Novas Oportunidades programmes allows to calculate the average share of RPL participants on total upgraders to correct estimated DID effects according to equation (5). Unfortunately, this calculation is not immediate for upgraders to basic education certificates, due to the difficulty of obtaining disaggregated information on RPL certificates. In contrast to a marked emphasis on the number of candidates enrolled in both formal adult education courses and RPL processes by education level and by year (see, e.g., ANQ, 2010; GEPE 2009 and 2011), available information on delivered qualifications is not disaggregated by education level in the case of RPL basic education certificates. Calculating the share of RPL participants on all upgraders as the ratio of

¹¹ About 8,600 individuals received a basic education certificate at the end of an RPL process in 2003, 35% of whom were estimated to be employed in the private sector (CIDEDEC, 2007). In the same year QdP data report about 50,400 upgrades to a basic education certificate among employees in non-agricultural private sector industries. In the case of upgrades to secondary education CNE (2011) reports no RPL-based certificates in 2006, with the first 248 certificates issued in 2007.

¹² Test outputs are available from the author upon request.

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RPL candidates to total enrolments in adult education is not a satisfactory procedure given the higher effort, hence the lower success rate, of formal adult education compared to RPL processes. Accordingly, figures on enrolments by education level were multiplied by the average success rate scored by all individuals in RPL in a given period to obtain an estimate of delivered certificates.

Table 1 reports the estimated share of RPL upgraders on total upgraders by treatment period and education level. Table 1 does not include the share of RPL upgraders for the 4th grade certificate, the lowest qualification in the Portuguese education system, because data on enrolment show that both waves of RPL policies never managed to attract more than a few hundred candidates per year, with the release of presumably even less certificates. Upgraders from no qualification to the 4th grade certificate were consequently dropped from the empirical analysis.

Table 1. Ratio of participants in RTL programmes to total upgraders by final education level

Final education level	Basic education		Secondary education
	6 th grade	9 th grade	12 th grade
RVCC Centres	35.27%	67.30%	--
Novas Oportunidades	59.87%	72.14%	64.33%

Elaboration on data from CNE (2011), GEPE (2009), GEPE (2011), and CNE (2013)

Available observations further shrink due to additional limits imposed on data. The analysis is restricted to individuals aged between 18 (the minimum age for eligibility in adult education initiatives) and 65 (the typical age of retirement) and to employees, excluding individuals in self-employment and unpaid jobs. Accounting for the delayed diffusion of RPL centres in the insular districts of Madeira and Azores (CNE, 2011), which in the latter case also developed according to partly autonomous criteria, the analysis focuses on continental Portugal. Given the focus of RVCC Centres and Novas Oportunidades programmes on basic and secondary education, observations on employees in post-secondary and tertiary education were discarded, as well as observations reporting an hourly gross wages below 80% of the minimum hourly wage prescribed in each year by the Portuguese legislation¹³ and 50% higher than the 99th percentile of the hourly wage distribution. Observation from employers in the agricultural sector, where participation in the QdP survey is not mandatory, and in public administration, not explicitly addressed by the QdP survey, were discarded. Eventually, to increase homogeneity among individuals who achieve

¹³ The Portuguese legislation allows wages to be as low as 80% of the official minimum wage in the case of apprentices and trainees.

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the same educational qualification the analysis considers only upgrades involving no more than one step along the ladder of educational titles and excludes employees who report more than one education upgrade in the same time window.

Despite all the above restrictions, and after controlling for missing information or conflicting information on the same individual in line with Cardoso (2004), the final dataset includes 65,468 observations on unique individuals in the baseline periods, 67,706 in the RVCC Centres period, and 92,242 in the Novas Oportunidades period.

Table 2 reports the differences observed between treated and controls in some descriptive variables by gender and final education level. The first two variables (pre-treatment deflated hourly wage and initial age) concern characteristics of individuals in employment. In line with standard expectations, across all periods the achievers of lower educational titles display lower pre-upgrade hourly wages and higher mean age. With the exclusion of female employees upgrading to the 6th grade certificate, pre-upgrade wages display a downwards time trend, which may reflect either the success of the enforced policies in attracting low-skill candidates or the progressive exclusion of poorly qualified individuals from more lucrative positions that increasingly require secondary and tertiary qualifications.

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Table 2. Descriptive variables by gender, final education level, and RPL initiative (treatment)
[mean values by cell]

		Gender		Males				
		Final education level	6 th grade	Females 9 th grade	12 th grade	6 th grade	9 th grade	12 th grade
Control group ^(a)	Pre-upgrade hourly wage [€ 2012] ^(b)		3.4	3.9	4.9	4.5	4.9	6.0
	Age [years]		33.7	31.1	32.3	34.5	31.1	33.2
	Firm sales per employee [.000€ 2012]		36.5	51.1	70.0	63.6	78.4	92.8
	Index of GDP per inhabitant ^(c)		91.8	98.4	103.7	94.7	99.5	103.2
RVCC Centres	Pre-upgrade hourly wage [€ 2012] ^(b)		3.4	3.7	--	4.2	4.5	--
	Age [years]		37.1	32.5	--	36.6	31.4	--
	Firm sales per employee [.000€ 2012]		30.1	40.4	--	47.6	59.6	--
	Index of GDP per inhabitant ^(c)		91.8	95.8	--	91.3	95.6	--
Novas Oportunidades	Pre-upgrade hourly wage [€ 2012] ^(b)		3.5	3.7	4.4	4.3	4.6	5.4
	Age [years]		40.5	35.4	31.1	39.7	33.4	31.6
	Firm sales per employee [.000€ 2012]		27.6	35.6	55.0	47.4	58.9	71.2
	Index of GDP per inhabitant ^(c)		91.8	91.9	100.6	90.8	92.6	101.3

(a) Basic education certificates (6th grade and 9th grade); the control group includes upgraders between November 1999 and October 2000. Secondary education certificates (12th grade); the control group includes upgraders between November 2003 and October 2005

(b) Gross hourly wage calculated as the ratio of base monthly wage and additional regular monthly payments to regular working hours

(c) Annual index of Gross Domestic Product per inhabitant by NUTS 2 (Portugal=100); source: Portuguese Institute of Statistics

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Firm sales per employee in Table 2 capture the impact of employers' characteristics on participation. A uniform pattern arises across genders and periods, showing that applicants to lower education certificates come from less profitable companies. The declining values of sales per employee across periods suggest the progressive enlargement of participation in adult education to candidates employed in less dynamic workplaces. The last variable in Table 2 accounts for the geographical dispersion of treated and untreated employees. The proposed index, which scores 100 for the whole country on yearly bases, assesses differences in gross domestic product per inhabitant at the regional (NUTS 2) level. Provided data outline a pattern across genders and periods also in this case. Applicants to higher qualifications concentrate in richer areas, whereas upgraders to the 6th and the 9th grade certificate cluster in poorer districts. The decline in observed values by gender-qualification cell suggests once again the effectiveness of RPL efforts in attracting participants usually less prone to invest in adult education.

Overall, data in Table 2 show that variables expected to affect the propensity to participate in adult education initiatives vary with education levels. In addition, the significant differences between female and male employees stress the opportunity to perform separate analysis by gender, in line with most existing studies (Jenkins et al., 2003; Hällsten, 2012; Blanden *et al.*, 2012; Stenberg, 2011; Lima, 2012). Thus, the estimate of earnings differentials between participants in RPL and formal adult education is performed separately according to the gender and the initial qualification of observed employees.

5.2. DID estimates

Cross-period differences in Table 2 confirm the existence of structural dissimilarities between treated and controls that justify the adoption of a DID-PSM approach to account for both observable and non-time variant unobservable disparities. For each cell identified by employees' gender and initial education level the propensity scores to participate in treatment (*i.e.*, the propensity to educational upgrade under a support policy programme compared to educational upgrade in the baseline period) fed to the epanechnikov kernel matching algorithm is calculated by means of a logit regression with robust standard errors that takes advantage of the rich pre-upgrade information provided by QdP. Employee-specific and job-specific regressors include age, binary controls for 2-digit occupation, a variable indicating the modal education in the same 3-digit occupation, two binary variables flagging overeducation and undereducation compared to modal education, and total hours worked per month. Firm-specific variables include controls for employer size, measured as the natural logarithm of employees, and fixed industry effects based

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on 12 dummy variables. Local and institutional effects are captured by employee's district fixed effects (18 binary variables) and the annual index of gross domestic product per inhabitant at the NUTS 2 level mentioned above.

The effectiveness of propensity score matching is measured by the capability of the chosen algorithm to smooth down initial systematic differences between treated and untreated individuals, thus ensuring unconfoundedness. Based on an iterative approach the set of covariates in each logit regression by gender and education level was progressively adjusted to ensure standardised percent biases¹⁴ well below the usually accepted 10% cut-off (Austin, 2011). The explanatory power of estimated logit models (R-squared between 14% and 32% when comparing the RVCC Centres initiatives to the baseline period and between 25% and 46% when comparing the Novas Oportunidades programme to the baseline period) is higher than the values obtained in other studies (Jenkins *et al.*, 2003). However, the still comparably low values signal the important role played by unobserved individual heterogeneity, which the DID estimates account for at least as far as it concerns time-invariant effects.

Table 3 reports the average 3-year change in the logarithm of gross hourly wage for participants in RPL versus participants in formal adult education. For comparative purposes the first panel of Table 3 shows the gains estimated by means of difference-in-differences equations that do not account for the non-random distribution of pre-treatment characteristics between treated and untreated observations. In contrast, the second panel reports the estimates based on DID-PSM with epanechnikov kernel matching. Both panels report the CACE parameter calculated based on equation 5 in section 4, with bootstrapped standard errors (200 replications).

The negligible number of observations lost to perform the DID-PSM estimate on the common support of the propensity score, *i.e.*, to ensure that for each given value of the covariates both treated and controls can be observed (overlap assumption), allows to exclude biases in outcomes due to this restriction.

¹⁴ The standardised percent bias of a pre-treatment covariate is calculated as the percent ratio between i) the percent difference of the sample means in the treated and untreated sub-samples and ii) the square root of the average of the sample variances in the treated and the control groups (Rosenbaum and Rubin, 1985).

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Table 3. Estimates of 3-year increase in ln hourly wage for participants in recognition of prior learning

	Women					Men				
	DID estimates					DID estimates				
Treatment	RVCC Centres vs. Baseline		Novas Oportunidades vs. Baseline			RVCC Centres vs. Baseline		Novas Oportunidades vs. Baseline		
	<i>Coeff.</i>	<i>Bootstrapped std. err.</i>	<i>Coeff.</i>	<i>Bootstrapped std. err.</i>		<i>Coeff.</i>	<i>Bootstrapped std. err.</i>	<i>Coeff.</i>	<i>Bootstrapped std. err.</i>	
Final qualification										
6 th grade certificate	-0.037	0.024	0.062	0.015	***	-0.020	0.024	0.058	0.013	***
9 th grade certificate	0.009	0.020	0.046	0.018	***	-0.013	0.019	0.046	0.016	***
12 th grade certificate	-	-	0.064	0.018	***	-	-	0.078	0.021	***
	DID with Kernel PSM estimates					DID with Kernel PSM estimates				
Treatment	RVCC Centres vs. Baseline		Novas Oportunidades vs. Baseline			RVCC Centres vs. Baseline		Novas Oportunidades vs. Baseline		
	<i>Coeff.</i>	<i>Bootstrapped std. err.</i>	<i>Coeff.</i>	<i>Bootstrapped std. err.</i>		<i>Coeff.</i>	<i>Bootstrapped std. err.</i>	<i>Coeff.</i>	<i>Bootstrapped std. err.</i>	
Final qualification										
6 th grade certificate	-0.062	0.055	0.060	0.043		0.003	0.029	0.084	0.018	***
9 th grade certificate	0.015	0.037	0.055	0.057		-0.021	0.027	0.054	0.029	*
12 th grade certificate	-	-	0.053	0.021	**	-	-	0.062	0.024	***

*** $p < 0.01$ ** $p < 0.05$ * $p < 0.10$.

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Outcomes in Table 3 suggest three main considerations. First, the labour market did not penalise the holders of primary and secondary education certificates obtained by means of RPL processes. Based on DID-PSM estimates differences in post- and pre-treatment log hourly wages, which approximate percent change in earnings (McGuinness, 2006), are non-significant or even positive. However, also when significant relative wage gains remain limited. The average compound annual growth rate of the gross hourly wage ranges between 1.7% (female employees upgrading to the 12th grade certificate under Novas Oportunidades) and 2.7% (male employees upgrading to the 6th grade certificate under Novas Oportunidades).

Second, the return to participation in RPL differs between the two examined policy initiatives. When accounting for systematic differences in the distribution of initial characteristics of treated and untreated individuals (DID-PSM coefficients) the estimated differentials are never significant for participants in the RVCC Centres programme, whereas coefficients turn positive and mostly significant for upgraders under the umbrella of the Novas Oportunidades programme. The stronger investment in communication that accompanied Novas Oportunidades compared to RVCC Centres may have contributed to create a different, more positive awareness among both employers and employees about the contents and targets of skills recognition and appraisal processes in the second round of RPL policies.

Third, comparison between the first and the second panel of Table 3 shows that, when treatment is education upgrade during the enforcement of the Novas Oportunidades programme, estimated coefficients are lower and less significant when accounting for non-random differences between treated and controls, except in the case of male employees upgrading to the 4th grade certificate. Overlooking the different distribution of pre-treatment characteristics that significantly affect the probability of selection into treatment biases upwards the estimate of relative wage gains due to shift of employment to better paying occupations (professionals and technicians vs. workers), industries (services vs. manufacturing), and geographical districts (coast vs. interior), especially in the case of female employees.

6. Concluding remarks

The achievement of additional educational qualifications by adult workers prospects advantages for employers and employees both when the new diploma results from participation in a formal education programme and when education upgrade follows from appraisal and recognition of prior learning. Potential benefits include better matching between labour demand and supply, availability of a more qualified workforce in support of modernisation and growth processes,

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increased motivation to learning, and improvement of professional and career perspectives. In the first decade of this century Portuguese policy makers promoted a massive effort to improve the educational qualification of the Portuguese workforce also by implementing an extended network of centres in charge of appraising prior and experiential learning and delivering primary and secondary education certificates.

Based on the Portuguese QdP survey this paper has assessed the economic return to RPL under the umbrellas of the RVCC Centres and the Novas Oportunidades initiatives by means of DID-PSM estimates. The adopted identification strategy allowed to disentangle the average wage gains enjoyed by participants in RPL promoted by the enforced policy programmes from the wage benefits enjoyed by participants in traditional formal adult education.

The outcomes of the empirical analysis show that RVCC Centres and Novas Oportunidades exerted very different effects on participants' wages. Under the RVCC Centres initiative participants in RPL displayed similar rates of wage increase compared to upgraders in the baseline period. Possibly thanks to a widespread diffusion of appraisal centres on the national territory and to a strong investment in communication with candidates and employers the situation reversed during the following Novas Oportunidades programme, when wage differentials compared to baseline participants in traditional formal adult education became significant and positive, especially in the case of male upgraders.

Based on estimated outcomes, the proposed analysis provides an overall positive evaluation of the examined RPL programmes. Issued qualifications provided participants with wage growth opportunities similar to (under RVCC centres) or even better than (under Novas Oportunidades) those allowed for by formal adult education courses. This outcome, which differs from past findings of the literature (Lima, 2012), probably follows from the choice of comparing participants in RPL programmes with upgraders from formal adult education instead of contrasting RPL participants and generic non-participants.

Further research may throw additional light on the preliminary findings proposed in this paper by exploring two promising research lines. First, the assessment of the extent of the time interval during which upgraders enjoy increasing wage benefits compared to stayers would help to quantify the overall wage return to investment in recognition of prior learning. Second, QdP allows for additional measures of the impact of investment in adult education on individual professional situation. By exploring the frequency and the direction of occupation and employer switches after an education upgrade future analyses may help to qualify the consequences of RPL beyond the sole monetary dimension.

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