Evaluating the Impact of Vocational Education in Portugal: a Successful Case of Institutional Collaboration
Introduction

This paper describes an ongoing collaborative project in Portugal involving several government agencies, a public university, and the European Commission. The project aimed to assess the effects of a recent large-scale expansion of vocational education in Portuguese high schools.

Portugal has underperformed in education for a long time, compared with other high living-standard countries. In 2014, 43 per cent of the population between 15 and 64 years old had completed upper secondary education. Although this represents a substantial improvement from historical low levels (for example, 20 per cent in 1992), it still represents the second lowest value in the OECD (just above Turkey), leaving Portugal far below the EU average (72.5 per cent). Moreover, among the population aged 18-24, the rate of early leavers from education and training remains high compared with the EU average (17.7 per cent compared to 11.3 per cent in 2014), despite substantial improvements in the past decade (38.5 per cent in 2006).

The recent reduction in school dropout rates among young Portuguese is commonly associated with the 2004 decision by the Portuguese Government to expand the offer of vocational courses in public high schools (ISCED 3). Vocational education courses constitute an alternative to secondary scientific-humanistic programs, providing students who complete the program with a double qualification: the secondary school diploma and a certificate of initial technical skills. The curricula of vocational courses have a strong practical component, a set of generic subjects (offered in most secondary education courses) and a short workplace component (similar to an apprenticeship) in local companies. Although vocational education aims to facilitate the transition to the labour market, it also allows students to proceed to tertiary education.

The number of students enrolled in vocational courses in Portugal grew from 37,000 in 2005 to almost 118,000 in 2013, or about 30 per cent of the current student population at the upper secondary education level. The explicit goals of this reform included reducing the incidence of school failure, adjusting course contents to student expectations and abilities, and improving the match between the supply of skills and the needs of employer organisations.

Although the expansion of vocational courses is concomitant with the aforementioned drop in the rate of early school leavers – suggesting a causal relation between the two – we still lack robust evidence establishing that causality. More importantly, there is little evidence regarding the impact of the vocational education reform on school failure or on the match between the supply of skills and the needs of employer organisations.

The expansion of vocational education in Portugal was financed mostly by the European Social Fund (ESF), as part of the European Union’s Cohesion Policy. The European Commission has been calling on Member States to adopt more rigorous and deep analyses of the impact of policies co-funded by EU’s Cohesion Policy, not only to improve its accountability but also as an input to improve the design of policies to be funded in the current programming period of EU funding (2014-2020). In this vein, the Portuguese authorities responsible for the coordination, management, monitoring and evaluation of the ESF in Portugal have,
In recent years, been involved in several efforts to improve the knowledge of the impact of ESF-related policies.

In early 2014, in response to a call from the European Commission’s Director General of Employment, the Portuguese authorities and university partners submitted a proposal to conduct a counterfactual evaluation of the impact of vocational courses on students’ school and labor market performance. From its inception, the project included a strong capacity building component that sought to develop and diffuse knowledge related to counterfactual impact evaluation methods and practices among civil servants, academics, and evaluation consultants. For that purpose, the project was designed as a collaborative effort involving several governmental agencies belonging to different ministries and university partners.

In the remainder of the paper we briefly describe the institutions involved in the project and their collaborative efforts, the data and methods used, the preliminary results, the project expected implications for both policy making and capacity building, and lessons learnt.

Institutional collaboration for policy impact assessment

A counterfactual impact assessment of vocational education on individuals’ school and labor market performance is a demanding venture for several reasons. One crucial issue is the availability of relevant data. The ultimate goal of the analysis is to isolate the effects of enrolment in vocational courses from other factors that may influence individual performance. This type of analysis requires information at the individual level regarding the enrolment in vocational or other programs, as well as the factors affecting the probabilities of success/failure at school and in the labour market. This kind of data is often imperfectly collected (if it is collected at all), and usually dispersed across different agencies that follow diverse data management procedures and rarely collaborate. Potential problems regarding statistical secrecy tend to discourage government agencies from engaging in this type of collaborations. Moreover, in many cases, the government agencies holding the relevant data have a limited understanding of the methods involved in counterfactual IE and do not consider policy evaluation to be a priority. This, together with the daily overload in their core activity and the scarcity of human resources, reduces the incentives of these agencies to enrol in time-consuming evaluation projects.

In order to overcome these obstacles we adopted the following measures in this project. First, the various institutional partners were involved at the highest levels (DG or equivalent) in the project from its design phase. Second, the goal of capacity building was explicitly included in the proposal, in particular in the form of training sessions and workshops. Third, the project management assured that the partners were permanently involved in all relevant steps of the project.

These measures fostered a climate of trust among the parties, simplifying the exchange of information and the search for solutions to delicate problems (e.g., the need to comply with the principle of statistical secrecy while allowing the analysis of data from different sources). Moreover, data providing agencies were actively involved in the design and implementation of the impact assessment study – rather than merely providing information – increasing their sense of ownership regarding the project. Finally, having the governmental entity responsible for monitoring and evaluating the ESF co-funded policies, the Portuguese Agency for Development and Cohesion, directly coordinating the project fostered the notion that its results would actually be reflected in policy decisions. All of these contributed to encouraging all the partners to work hard.

Finding the appropriate method

The crux of the project consisted in applying a counterfactual logic to estimate the impacts of the vocational courses in education and labour market outcomes for students enrolled in the first year of upper secondary schooling.
In particular, we used a Coarsened Exact Matching approach, by which the performance of students enrolled in vocational education are compared with the performance of other strictly identical individuals, according to the variables used in the analysis, except that they were enrolled in scientific-humanistic courses.¹

Essentially, the method comprises three steps. First, we match students, i.e., creating groups of identical individuals according to the variables expected to influence the student performance (more on this below). Second, we estimate the impact of vocational education within each homogeneous group, by simply computing the average outcomes in student performance separately for vocational courses and for scientific-humanistic students, and computing the difference in the average outcomes between the two subgroups. In the final step, we compute the global impact of vocational courses as the weighted average of the impacts per homogeneous group of students with weights given by the proportion of vocational education students in each group.

This matching method proved to be highly adequate in this project. Besides its technical advantages with regard to other matching approaches (see, e.g., Iacus et al., 2012), its simple logic proved to be rather intuitive and easily grasped by partners with no advanced training in statistics and econometrics.

Obtaining and preparing the data

The counterfactual assessment implemented in this project required data related to three types of variables: (i) the type of education (vocational versus scientific-humanistic) in which the students are enrolled; (ii) the outcomes of interest (transition, conclusion, dropout, access to higher education, and transition to employment), and (iii) the factors that determine individuals’ school and labour market performance. The latter include variables related to demographic characteristics (sex, age), family background (economic condition, guardians’ academic background), past school performance (previous retention episodes, results in national exams of Portuguese and Math in the previous year), and the school context (proportion of students receiving social support, endowment of human resources).

The data regarding students’ characteristics, family background, school context and individual school trajectory were drawn from different administrative datasets managed by the statistical bureau of the Ministry of Education and Science, all of which are based on information collected directly from schools and higher education institutions. These datasets had never been crossed for the purpose of a longitudinal analysis, requiring a significant effort by the agency’s technical staff in collecting and organizing the data for the purposes of the project. The data related to the trajectory of students in the labour market was obtained from two government agencies in the Ministry of Labour and Social Affairs – one that collects information on public social security, the other on unemployment². We were able to cross the various pieces of information by using an individual identification code that was specifically created for this project.

On the basis of the available data, we analysed three cohorts, composed of the students enrolled in the first year of upper secondary school (10th grade) in the academic years 2008/2009, 2009/2010, and 2010/2011. We were able to trace their trajectory between the previous year (t-1) and the following three years (t+3), allowing for the analysis of the impacts of vocational courses on individual school and labour market performance.

¹ We assume that the alternative for a student who enrolls in vocational education at the upper secondary school level would be to enroll in the ‘regular’ scientific-humanistic education. In other words, students enrolled in the scientific-humanistic courses constitute the counterfactual for students enrolled in vocational courses.

² In order to cross the data from these different sources while complying with statistical secrecy laws, a specific protocol was established assuring that none of the partners could access information collected by other partners regarding identifiable persons.
Counterfactual impact assessment results and discussion
We analysed the following outcome variables regarding school performance:

- Transition in year $t$ (i.e., from 10th to 11th grade)
- Transition in years $t$ and $t+1$ (i.e., from 10th to 12th grade)
- Drop-out between $t$ and $t+2$
- High school graduation at $t+2$
- Enrolment in higher education after $t+2$

Overall, we concluded that vocational education has positive impacts in grade transition and high school graduation, and null or negative impacts in dropout rates and access to higher education (all impact coefficients are statistically significant).

More specifically, we found that vocational education increases by 24 per cent the probability of transition from the 10th to the 11th grades in $t$, by 31 per cent the probability of transition from the 10th to the 12th grade within two years, and by 36 per cent the probability of high school graduation by the end of $t+2$. Regarding enrolment in higher education after $t+2$, vocational education seems to decrease the probability of participation in post-secondary studies by 12 per cent. Finally, the estimated impact of the program on dropout rates in the first two years of high school was negligible.

These results confirm the idea that the expansion of vocational education has made a positive contribution to the recent improvement in youth education attainment in Portugal. The fact that the probability of dropout in the first two years does not decrease significantly if a student is enrolled in vocational course (instead of a ‘regular’ program) is largely explained by the fact that dropout rates tend to be rather low during this initial period (below 10 per cent in both types of education). In contrast, our results reveal that vocational courses are indeed helping to increase the proportion of young people graduating from high school.

The normative interpretation of the estimated (negative) impact of vocational courses on proceeding to post-secondary education – i.e., similar students who follow different educational paths will be excluded from higher education more easily if they enroll in vocational education – is less clear. On the one hand, this result is not especially surprising if we consider that vocational education aims to facilitate the transition from school to work. On the other hand, taking into account that higher education in Portugal includes not only universities but also polytechnic institutions (offering more professional-oriented programs, suited to students with a vocational education and training background), and that the higher education wage premium is still considerably high in the Portuguese economy, our results may be indicating an overly-strong bias against proceeding to higher education among vocational courses.

In order to disentangle this, our project will also assess the impact of vocational education on the probability of finding a job after high school graduation, for those students who did not proceed to higher education after $t+2$. The necessary data for this only became available recently and the preliminary results will be computed in the coming months.

The institutional outcomes of the project
The relevant outcomes of the project presented in this paper go further than the results of the impact assessment. No less important, this project has enhanced the skills of the partners’ technical staff on impact assessment analysis, and the awareness regarding the usefulness (and limitations) of these methods for policy evaluation. Moreover, it fostered collaboration among public agencies, facilitating the future development of similar impact assessment studies. Finally, the project demonstrated the viability and usefulness of a counterfactual impact evaluation based on individual data drawn from different institutional sources.
In our view, the decisive aspects for the successful implementation of this project include the following: the institutional engagement of public agents at the highest level from the design phase; the involvement of the university team as a partner on an equal footing (and not as external experts or consultants) with regard to public agencies, and the permanent concern by project management with training and knowledge-sharing among participants. These elements all contributed to fostering trust and engagement between the institutional partners, helping to overcome data-related obstacles and the restrictions imposed by the scarcity of human resources. Similar efforts may give useful guidance in the implementation of successful impact evaluation projects in other socioeconomic contexts.

References

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