

Sometimes it works! The effect of a reform of the short vocational track on school-to-work transition.

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Abstract

This paper studies the impact on the length of school-to-work transition of a reform that extended from two to three years the short vocational track in Italy in the early 2000s. The paper uses the difference-in-differences methodology to estimate the impact of the reform, exploiting its staggered implementation across regions. The analysis is restricted to graduates from the short vocational track before and after the reform so that comparisons among relatively homogeneous groups of individuals can be made. The study finds that, overall, the reform had a positive impact and reduced school-to-work transition by around 4 months (a 17% reduction). Moreover, the new short vocational track proved to be extremely effective for immigrants and females, whose school-to-work transition was reduced by 1.8 years and 0.8 years, respectively. In implementing the new short vocational track, some regions adopted a quasi-market organization in which private training institutions competed with public schools. This model proved to be more effective in shortening school-to-work transitions, in particular for immigrants.

Keywords: vocational education, school-to-work transition, policy evaluation.

1. Introduction

A number of OECD countries display a large and persistent proportion of early school leavers and high youth unemployment rates. Among them, Italy stands out as one of the OECD countries with the highest youth unemployment and NEET rates. Obstacles in the school-to-work transition and skill mismatches are among the main causes of a ‘youth problem’ in the labor market (Pastore et al, 2021). In this regard, vocational education, and training (VET) has often been advocated as an effective policy with which to increase youth employability and to favour school-to-work transitions, since it provides young people with skills and knowledge directly related to a wide range of occupational fields, production, services, livelihoods or vocations (UNESCO, 2016). In the Europe 2020 strategy, VET systems have contributed to the reduction of the rate of early school leavers to below 10 per cent. Furthermore, the new EU Skills Agenda highlights the role of VET as a strategic asset with which to overcome the Covid crisis, to support social inclusion and equal opportunities, and to provide a reference point for skills development (EC, 2020).

In this paper we study the effect of VET courses in upper-secondary education on the speed of school-to-work transitions. To identify causal effects, we exploit a reform enacted in Italy in the early 2000s and which thoroughly revised the structure and content of VET courses. The reform was very comprehensive: it lengthened the short vocational track from two to three years; it introduced mandatory general subjects (such as language, math, and history), providing students with more general and soft skills; and it regulated also which educational institutions could offer such programs (schools or accredited training centers). Furthermore, for the first time the reform officially recognized VET qualifications in the formal education system (corresponding to ISCED353).

Compared to more general or academic tracks of education systems, the vocational track has the advantage of responding faster to rapidly changing labor demand in terms of skill contents, and it is able to foster skills that will give individuals the ability to act as enablers of the innovation process. However, the economic literature has pointed out that this short-term benefit may come at the cost of lower employability in the long run. Cross-country difference-in-differences estimates based on both IALS (Hanushek et al. 2017) and PIAAC data (Hampf and Woessmann, 2017) confirm the existence of this trade-off: compared to individuals with general education, those with vocational education initially have better employment outcomes, but they experience lower employment probability later in their working lives.

Extensive research has been devoted to studying the effects of vocational education and training on labor-market outcomes, such as school-to-work transitions, employment status, and earnings. In this setting, the main identification challenge is to define the counterfactual situation.

Focusing on secondary education, the ideal strategy would be to randomly assign students to either the vocational or the academic track and then compare the average performances of the two groups in the labor market. However, in this context randomization is not feasible for both ethical and practical reasons. Hence, estimates should be based on quasi-experimental methods. Recent studies have in fact compared the labor-market performance of students in the vocational training track with that of those in the academic track, trying to control for confounding factors that can influence both self-selection into a track and subsequent labor-market performance (the so-called ‘selection bias’, Ryan, 2001; Eichhorst et al. 2015). Since in most countries students negatively self-select (for example, in terms of ability, achievement and socio-economic background) into the vocational track, OLS estimates are probably downward biased and hence underestimate the true labor-market effects of vocational education in high schools.

To tackle these selectivity issues, different empirical strategies have been used in the literature, also depending on the institutional context and the features of the data available. Few studies control for selection on observables (Brunello and Rocco, 2017, Brunetti and Corsini, 2019), while others apply econometric techniques that make it possible to control for selection on unobservables (Meer, 2007; Torun and Tumen, 2019). A growing body of literature exploits exogenous reforms of the high-school system (Oosterbeek and Webbink, 2007; Hall, 2012 and 2016; Zilic, 2018; Bertrand et al., 2020), while very recent studies based on high-quality administrative data exploit discontinuities in admission rules (Silliman and Virtanen, 2021).

With few exceptions, once selection bias is taken into account, these studies find that vocational education has positive or no effects on subsequent labor-market performance, especially in terms of employment and in the short run. Furthermore, cross-country comparison shows that more positive results are recorded where a dual vocational system is in place, while labor-market effects are more mixed in school-based systems (Brunetti and Corsini, 2019).

Evidence from recent papers based on administrative data that exploit randomness or discontinuities in admission rules confirms the positive effects of vocational training on labor-market prospects. For example, Silliman and Virtanen (2021) focus on students who express preferences for both vocational and academic education in high schools in Finland. By exploiting admission rules for this sub-sample of students in a regression discontinuity design, they show that admission to the vocational track increases earnings both in the short and the long run (until at least the mid-thirties) and it does not significantly alter the likelihood of ending up in jobs that are more at risk of closure due to technological progress or international competition. Although these studies are based on high-quality

administrative data that make the estimated causal effects more reliable, they are often dealt with rather small samples of students, which may limit their external validity.

Our paper contributes to the last – and growing – body of research that exploit exogenous changes in vocational education in a difference-in differences framework (DID). Most of the existing studies consider reforms that increase the length and the general content of vocational training in secondary education¹, finding no effects on either university enrollment or labor-market performance, both in the short and the long run. On the contrary, such reforms may hamper the labor-market prospects of low-achieving students (Hall, 2012 and 2016).² Furthermore, no significant effects on earnings in the long run emerge (Ooesterbeek and Webbink, 2007).

Zilic (2018) considered a more overarching reform of secondary education in Croatia in the mid-1970s, which resulted in reduced tracking and more mixed curricula (that is, extended general education in the vocational track and some vocational content in the academic track). The timing of the reform, combined with rules on admission to elementary school, created a discontinuity in the cohorts actually affected by this reform which can be exploited in a Regression Discontinuity Design. Estimates revealed heterogeneous effects by gender in terms of educational outcomes (with adverse effects on completing university education only in the case of males), but with no significant effects on future employment or earnings for either gender.

Bertrand et al. (2020) estimated the effects of a reform implemented in Norway in 1994 that both integrated more general education into the vocational track and fostered apprenticeship in the same track. Identification of causal effects relied on a difference-in-discontinuity research design, in which students born just before and after the reform's birthdate eligibility cutoff were compared to students born around the same cutoff in non-eligible years. Estimates based on administrative data for the entire Norwegian population showed that the reform increased enrollment in the vocational track for both genders, but it positively affected earnings (and reduced propensity to offend) only in the case of men, especially among the most disadvantaged ones. Furthermore, there is evidence that men and women are likely to pursue vocational education in quite different fields, with men prevailing in fields more likely to lead to higher-paid jobs. These heterogeneous effects contribute to exacerbating gender differences in the labor market.

¹ Similar reforms were implemented in the Netherlands in 1975, in Sweden in 1991.

² Note that Hall (2012) investigated the effects of a six-year pilot study in Sweden, which gave rise to the 1991 reform exploited in Hall (2016). In the pilot study, the new vocational tracks were implemented and evaluated in selected municipalities.

We share with these studies our identification strategy, which relies on a difference-in-differences approach; however, we depart from the existing literature for the control group considered, since we compare cohorts who graduated from the short vocational track before the reform with those who completed this track after the reform, exploiting the staggered implementation of the reform on a regional basis.

Overall, we find that the reform law has reduced school-to-work transition by around 4 months, corresponding to 17% of the average length of time between the exit from vocational education to the first entry into employment. Moreover, the short vocational track has proved to be more effective for immigrants compared to natives, and for females compared to males. The adoption of a quasi-market as an organizational model has been more effective than the traditional model based mainly on public schools in shortening the school-to-work transition, in particular for immigrants.

The rest of the paper is structured as follows. In Section 2 we discuss the main features of the VET system in Italy, paying especial attention to the 2003 reform that we exploit in our empirical analysis. Section 3 presents the data and basic descriptive statistics, while Section 4 is devoted to the empirical strategy. In Section 5 we discuss our main estimates and robustness checks, together with further estimates aimed at capturing heterogeneous effects by socio-demographic characteristics and organizational model. The main results and policy implications are summarized in the last Section.

2. Institutional setting

The Italian school system has been characterized by several reforms since the beginning of the 2000s. In 2003 a new law (L. 53/03 Riforma Moratti) extended the age limit for compulsory education from 16 to 18 in order to guarantee all citizens the duty-right to receive education and training. The Italian school system was divided into two cycles: the first comprised primary school (5 years) and lower-secondary school (3 years), and the second one comprised high school (*liceo*), technical and vocational institutes (*istituti tecnici e istituti professionali*), with direct access to tertiary education, and vocational training schools.³ Figure I illustrates the Italian school system before and after the reform.⁴

Until 2003, vocational education and training in Italy was outside the state school system and was provided only by regions through vocational training agencies. Moreover, the sole purpose of this vocational system was to impart vocational skills. The Moratti Law replaced the ‘old’ system with a

³ In the following years, regulations issued by the State-Regions conference introduced further systemic elements and the reform was fully implemented in 2011/2012. However, they did not change the aim and the essence of the Moratti reform.

⁴ Above secondary level, the Italy system consists of Higher Technical Education and Training (IFTTS), Higher Technical Training (ITS) and University.

completely new short vocational track (Istruzione e Formazione Professionale, IeFP) that was included in the second cycle of education under the aegis of regions but with the same value as other schools in the state system and leading to a professional certificate recognised at national and European level (Qualifica Professionale).⁵ Importantly, the new short vocational track had a larger content of general education. It maintained a strong provision of vocational and technical skills but did not neglect the basic hard (i.e., literacy and numeracy) and soft skills (such as problem solving or critical thinking).

Among the most important novelties of the reform, there was the extension of the duration of IeFP from a two- to three-year track and the introduction of more general contents into educational programs. In this way, the reform overcame the usual distinction between education and training, and the new short vocational track may be considered completely different from the vocational educational and training systems implemented in other European countries.

FIGURE 1 ABOUT HERE

The short vocational track introduced by the reform was preceded by a long transitory phase which differed among regions in terms of timing as well as management.

Regarding the timing of the reform's implementation, Lazio, Lombardia, Veneto, Piemonte and Puglia introduced the third year in 2002/2003. Liguria, Molise, Friuli Venezia Giulia, Emilia Romagna, Toscana, Umbria, Abruzzo, Campania, Basilicata, Sicilia and Sardegna did so in 2003/2004, and the other regions (Valle d'Aosta, Marche, Calabria) in 2004/2005. Conversely, the autonomous provinces of Bolzano and Trento, which together form the Trentino-Alto Adige region, introduced the third year in vocational education and training systems several years before the reform (for more details see ISFOL, 2004 and Zagardo, 2013).

From a management and funding point of view, the organisation of this track was mainly under the aegis of the regions. However, the opportunity to offer a short vocational track was extended also to state-run professional public high schools by regional laws. In the former case, the government defines the general rules on vocational education and training and allocates the resources for implementation of the programmes to the regions. The regions are in charge of planning and providing the short vocational track. Furthermore, according to the provisions of the reform, the

⁵ The reform provided also for a fourth year leading to a diploma, but in 2010/2011 this additional year was introduced only by four regions, and the number of students enrolled in the fourth year was only 2.5% of the total number of students in the IeFP programs. We address this further extension of the reform in our robustness checks in Section 5.1.

training institutions must be formally authorized by the regions according to a list of criteria established at the national level. The regions that have mainly adopted this organisation system are: Piemonte, Lombardia, Liguria, Veneto, Lazio, Abruzzo, Molise, Puglia, Basilicata, Sicilia and Sardegna. By contrast, Friuli Venezia Giulia, Emilia Romagna, Toscana, Umbria, Campania have mainly implemented state-run programs. Even after the reform's full implementation in 2011/2012, both organizational models continued to coexist in some regions.

The main aim of the IeFP reform was to reduce the number of early school leavers, youth unemployment, and the NEET rates by increasing students' employability and easing school-to-work transitions. Furthermore, it was implicitly targeted on the most disadvantaged students in the vocational track, especially immigrants, women, and students in high unemployment regions or with a low socio-economic background.

The growth in the number of students enrolled on three-year IeFP programmes since 2003/2004 confirms the great importance of the reform. Notably, from 2003/2004 to 2004/2005 the number of students tripled, followed by another upsurge after full implementation of the reform in 2013/2014, when students enrolled on IeFP numbered more than 300 thousand, amounting to 11.4% of all students enrolled at secondary school (CNOS-FAP, 2014). The positive trend is also particularly interesting given that, in 1998-99, the old vocational track was attended by around 89,000 students, with a large reduction compared to the 170,000 of 10 years previously (Ghergo, 2009). The young people enrolled on the vocational track at the end of the last century were generally 15-16 years old; 13% were immigrants; 50% of them came from single-income households; and their parents' highest level of education was mainly compulsory schooling. Around 70% of boys and 80% of girls finished lower-secondary school on time (without experiencing grade retention) and 41% of the students were repeaters, coming from grade repetitions in state-run public schools.

3. Data and descriptive statistics

The data used for the analysis reported in this paper were taken from the Labour Force Survey (LFS). LFS is a representative cross-sectional dataset administered by the Italian Institute of Statistics (ISTAT, several years). It contains data on the current and past labor-market experiences of individuals, their sociodemographic characteristics, and educational attainment, with detailed information on tracks and sub-tracks attained. Given the aim of the empirical analysis, LFS data were suitable for two main reasons. First, sample size was large enough to allow the selection of a

sufficiently representative sample also in the case of a rare event like earning a 3-year qualification in the short vocational track in Italy. This could be attained also by exploiting the availability of different waves and using pooled cross-section data. Second, LFS data contain useful information with which to investigate school-to-work transitions. Indeed, respondents are asked when they started their first job. Furthermore, in 2014 ISTAT added a new question asking when the respondent had attained his/her highest level of education. Combining these two questions, we could retrospectively observe the length of the school-to-work transition and compute the time spent looking for the first job (in years), which we call *Length*. This variable would be the main outcome in our analysis. The major drawback of this dataset is that it does not include information about parental background⁶ and the final grade. Furthermore, since the question about the graduation year was introduced in 2014, well after the reform, we were not able to use information collected in the same year as the reform; rather, we were forced to use only retrospective information.

The short vocational track, as explained in the previous Section, used to attract a minority of young Italians in each birth cohort. Hence, addressing how young people self-select into different types of schools and fields of study is crucial when studying the impact of specific educational choices. In this regard, the literature clearly shows that young people self-selecting into a short vocational track are significantly different from those who pursue a 5-year high school diploma, especially in an academic track. In order to take selectivity issues into account, and to avoid comparing individuals too different from each other (and choose different education tracks), we decided to restrict our sample only to those students who graduated from the short-vocational track before and after the reform.

Our empirical analysis was therefore based on individuals who graduated from the short vocational track just before or just after the introduction of reform. To select the operative sample, we exploited the implementation of the reform, which was adopted by Italian regions at different dates, as summed up in Table I. As said in the previous Section, Italian regions can be clustered into three groups in terms of the timing of the adoption of the new short vocational track: a first group of regions implemented the reform in 2002; a second (larger) group implemented it in 2003; and a few regions did so in 2004. Given this scattered timing of adoption, we retained only those individuals who had graduated from a short-vocational track in the years from 1997 to 2013. Hence, we considered an interval of +/- eight years around the first graduation year affected by the reform (i.e. 2005).

It should be noted that, in the transitory phase of the reform, the 'old' vocational courses and the new short vocational ones could both be offered within the same region. Unfortunately, we could not observe which type of short vocational track the individual attended, nor the actual length of the short

⁶ This information is available only for young people cohabiting with their parents, who represent 35% of the total sample.

vocational track, which was 2 years before the reform and 3 years after. Therefore, to be conservative, for each region we considered as treated those individuals who graduated after the pivotal year, which was 2005 in the regions of the first group, 2006 in the second group, and 2007 in the third (Table 1). All the graduates in Trentino-Alto Adige belonged to the treated group, since the reform was implemented in that region well before our period of analysis.

The dummy *Reform* was then defined according to this assignation rule and took value 1 for those individuals who graduated, in each region, after the corresponding pivotal graduation year. Finally, we retained in the sample individuals who had attained the short vocational degree by the age of 21, that is, with a four-year lag with respect the normal age at which this track should be finished after the reform, thus excluding those individuals with longer and possibly very convoluted courses of study.

TABLE I ABOUT HERE

Our final sample consisted of 8858 graduates from the short vocational track. Table II reports their sociodemographic characteristics. About 31 percent were females, one out of four was born abroad, 43% attained a short track diploma in manufacturing (mechanics, chemistry, ICT), 24% in services, especially personal services, and the remaining individuals in other fields.

TABLE II ABOUT HERE

On average, school-to-work transition lasts 1.8 years, as shown in Table II. Before the reform it took more than 2 years on average for young graduates to find their first job. The reform reduced this period by around 10 months. As can be seen, while the share of female remained stable after the introduction of the reform, the share of immigrants decreased significantly. Interestingly, graduation age did not change with the reform, even though it extended the duration of the short track by one year: it appears that the reform was also able to boost the regularity of school careers, increasing the share of students able to finish on time. The reform, by regulating nationally the types of programs offered, renewed the supply of programs, which changed the composition of our sample in terms of field of study. Finally, four regions (Piemonte, Trentino-Alto Adige, Lombardy and Veneto) account for more than sixty percent of the total sample.

4. Empirical strategy

The aim of the empirical analysis was to estimate the effect of the reform on the duration of school-to-work transition in Italy in the early 2000s. We used a difference-in-differences approach, exploiting the staggered adoption of the reform among Italian regions. Using only the sample of individuals who had attained a vocational qualification before and after the reform, we compared the graduation cohorts affected by the reform with those not affected and estimated the following equation:

$$Y_{irt} = \alpha + \beta \text{Reform}_{irt} + \lambda X_i + \gamma_r + \tau_t + \varepsilon_{it} \quad (1)$$

where the suffix “*irt*” denotes the *i*-th individual who graduated in year *t* and in region *r*. Y_{irt} is the number of years elapsed between graduation and the first job. We denote this outcome as $Length_{irt}$. Reform_{irt} is a dummy variable, which takes value 1 for those individuals who graduated 3 years after the adoption of the reform in their region. X is a vector of individual control variables (gender, year of birth, migrant status), γ_r are region fixed effects and τ_t are time fixed effects controlling for the graduation year. Region fixed effects capture youth labor market conditions at a regional level, while graduation year fixed effects control for macroeconomic common shocks happening in the graduation year.

As explained in the previous section, we could not observe the length of the short vocational track in our data. Thus, we assumed an extremely conservative approach in defining the *Reform* dummy as potential exposure to the reform, and the coefficient β could be interpreted as an Intention to Treat rather than an average Treatment effect on the Treated (ATT). Should we find a significant effect of the Reform, we could interpret it as a lower bound of the true effect of the reform.

The main assumption that we made to identify β was that if the reform had never been introduced, the school-to-work transition of the post-reform cohorts would have been largely identical to that of the pre-reform cohorts (after controlling for observable differences between the groups, including region and time fixed effects). To this end, the most important control we needed to add to our specification was the year of birth of the individuals, because it would control for any discontinuity that might happen between cohorts. More importantly, since year of birth, together with graduation year, controlled for school duration, we were indirectly controlling for any irregularity in the school career, such as changes of track, missed years or repeated grades. Irregular careers were very frequent in this track, and in order to give robustness to our identification strategy, and to be sure that we were not picking up some unobserved heterogeneity due to this feature, we also estimated equation (1)

adopting an even more conservative approach and using birth cohorts rather than graduation cohorts for the assignment rule (see the following Robustness Section).

5. Main results

5.1. Baseline estimates

Table III reports our main estimates of the effect of the introduction of a short vocational track on the length of school-to-work transition. Given our identification strategy, all model specifications include region and graduation year fixed effects. In column 2 we control also for student's year of birth. In the remaining columns, we progressively add further controls for personal characteristics (gender and migrant status, column 3) and the field of study (column 4). Overall, our estimates show that the new vocational track seems to have eased school-to-work transition by significantly reducing the time spell between the end of school and entry to the first job. More specifically, the estimated effect is around a third of a year (i.e. four months) less in the school-to-work transition. This effect is rather large, given that the mean length of time between the exit from vocational education to the first entry into employment is 1.8 years. Hence, the reform has reduced school-to-work transition by around 17%. Interestingly, the estimated impact is rather robust to the progressive inclusion of different sets of control variables. If anything, the estimated impact slightly increases once we control for both personal characteristics and the field of study.

TABLE III ABOUT HERE

We then ran several further estimates to check the robustness of our main results. We started a slightly different assignment rule and used year of birth rather than graduation year to assign individuals to the treated group. In doing so, we adopted a more conservative approach and computed the pivotal cohort, i.e., the first one to be exposed to the reform, as those born in the regions of each group by subtracting 14 from the year of implementation (Table I, column 3). In this way, we considered as treated those individuals who had been able to enroll at 14 on the new type of short vocational track introduced by the Reform. In Table I, column 3 we report the first year of birth affected for each group of regions. We retain in the sample individuals born between 1980 and 1996, an interval of +/- eight years around the year of birth of the first cohort affected (that is, 1988). We then define the dummy Reform 2, which takes value 1 for individuals born in each region after the pivotal years reported in Table I, column (3). Table IV, column (1) reports the estimates when we used this alternative assignment rule. We simply report the clean DID estimation, including region FE, year of

birth FE and the alternative dummy reform. As can be seen, the results are slightly lower than, but otherwise not dissimilar from, our baseline estimates.

TABLE IV AROUND HERE

As a second robustness check, we added provinces (NUTS3 regions) fixed effects to our specification, which absorbed regional fixed effects and made it possible to control for more local labor-market conditions. Column 2 of Table IV displays the results of this exercise. As can be seen, narrower local fixed effects do not change our results.

To run a third robustness check, we acknowledged that, as already discussed in Section 3, half of our sample were residents in four regions (Piedmont, Lombardy, Trentino-Alto Adige and Veneto), which are all in the north of Italy, with more developed local labor markets and with low levels of youth unemployment compared to the Italian average. In light of these features, it could be that our baseline estimates picked up also some residual regional unobserved heterogeneity. To check for this, we re-estimated equation (1) using only these four regions. This exercise was closer to a pure DID estimate, since Trentino-Alto Adige is the perfect control region because its treatment did not change in the period under analysis. Instead, Piedmont, Lombardy and Veneto are regions in group 1, since they all introduced the reform in 2003. The results reported in column 3 of Table IV show that the effect of the reform is even larger than our baseline estimates.

Finally, since we did not want to pick up some other reforms, which might act as confounders in our setting, such as the pilot experiment conducted in some regions with the introduction of the fourth year⁷, we shortened the bandwidth around the first graduation year affected by the reform, i.e. 2005, to a +/- five-year interval. The estimates in column 4 of Table IV show that the effect of the reform remains unchanged.

5.2 Heterogeneous effects

Since the main aim of the new short vocational track was to allow potential early school leavers to obtain a formal qualification once they reached the compulsory schooling age, it is interesting to investigate whether the reform was actually more effective for potentially more disadvantaged students, such as immigrants or people with a low socio-economic background. Furthermore, given the nature of vocational education and the features of the Italian production system, where many small

⁷ See footnote 5

and medium-sized manufacturing firms require specialized manual workers, the impact of graduating from a short vocational track on school-to-work transition may differ also according to the field/sector of specialization (i.e., manufacturing vs. services).

Using the richest model specification, Table V reports the estimated heterogeneous effects by gender (column 1), immigrant status (column 2), parental background (column 3) and field of study (column 4). Furthermore, in the last column we also interact the reform with both gender and citizenship simultaneously, in order to capture more complex non-linearities in the effect of the reform along these dimensions.

TABLE V AROUND HERE

Our estimates clearly show that the effect of the reform is much larger and statistically significant for females and migrants, who can save 0.8 and 1.3 years respectively in the school-to work transition thanks to achievement of a 3-year vocational qualification. Interestingly, girls seem to benefit more than boys, and the estimated difference between the two groups is statistically significant. The interaction of the reform with both gender and citizenship highlights that the reform did not speed up school-to-work transition only in the case of Italian boys, whose estimated coefficient is actually positive, although not statistically significant. By contrast, the introduction of a short vocational track is highly effective for all immigrants, regardless of their gender.

Within the group of non-Italian individuals, the effect seems slightly larger for boys compared to girls (the length of time from graduation to employment declines by almost 1.4 years for boys, and by around 1.1 years for girls), but the difference between the two genders is not statistically significant. Again, we find a statistically significant effect of the reform also for Italian girls, who register a reduction of almost five months in the time spent between the end of school and the start of the first job. Furthermore, within the group of Italians, the differences by gender are statistically significant. As regards field of study, it appears that those courses not elsewhere classified and coded as ‘other’ benefited more from this reform. In this regard, the reform has also introduced new qualifications, so that the training and education provided are better suited to matching skills provision to the needs of enterprises and local economies.

5.3. The role of the organizational model

Since the local regional governments are in charge of planning and providing the short vocational track, when implementing the reform each region has adopted an organisation model centred either on state-run professional public high schools (Friuli Venezia Giulia, Emilia Romagna, Toscana,

Umbria, Campania and Sicilia) or on a quasi-market in which private non-profit accredited institutions compete with public schools to offer short vocational programs (all the other regions⁸). The introduction of a quasi-market should enhance competition among accredited institutions and public schools, improving training and educational services and easing the school-to-work transition, as happened with employment services (Pastore, 2020). Furthermore, private training centres may be better able to develop strong connections with the entrepreneurial system of their local economies. Through these connections, they may be more effective in integrating young graduates into the labour market. Since the public sector is often considered inefficient, while the private training institutions aim at efficiency and performance, the choice of the organisational model made by the local regional government may yield different results in terms of labour-market outcomes, and school-to-work transition in particular.

TABLE VI AROUND HERE

In this section we explore the effect of the two different organisational models adopted by the regions. We (fully) interact our reform dummy with the two organisational models, public vs. quasi-market. Table 8 shows that quasi-markets perform better than the model based on public schools, although in some cases the difference is not statistically significant. Interestingly, when we look at which subgroups benefit more from the quasi-market organisation, we find that immigrants are those that do so; but the quasi-market model has been able to ease school-to-work transition also for males. One possible explanation may reside in the different characteristics of the two organisational models. Public high schools seem more oriented to tasks of supervising and evaluating students' achievement and their integration into the economic system, and their network of enterprises is usually quite small. By contrast, accredited institutions are more inclined to offer services to firms, such as counselling and hiring, and they are likely to have more networks with private firms (Pastore 2020). Consequently, disadvantaged groups, such as immigrants, may be more likely to find a job in the presence of more market-oriented institutions. Moreover, this stronger effect on immigrants may be considered a signal that a quasi-market works efficiently, since accredited institutions prove able to place even individuals often discriminated against in the labour market.

6. Conclusions

⁸ The regions are Piemonte, Lombardia, Liguria, Veneto, Lazio, Abruzzo, Molise, Puglia, Basilicata, Sicilia and Sardegna.

This paper has investigated the impact on school-to-work transition of an overarching reform that extended the length (from two to three years) and scope (introducing more general contents) of the short vocational track in upper-secondary education in Italy in 2002-2003. To this end, it has exploited the staggered adoption of this reform across Italian regions in a difference-in-differences framework. Differently from most studies that use individuals graduating from the general education track as the counterfactual situation, we selected as control group individuals who graduated from the short vocational track before the reform. Our identification strategy thus relied on differences between individuals with a short vocational qualification before and after the reform and across groups of regions. Overall, our estimates evidenced that this reform was effective in easing school-to-work transition by around 4 months, corresponding to 17% of the average length of time between the exit from vocational education and the first entry into employment. This result was robust to a number of robustness checks, including alternative model specifications or more conservative definitions of the treated group.

Our estimates did not reveal significant differences by gender, whilst we found that the extension of the short vocational track proved to be more effective for immigrants compared to natives, especially in the case of males. This result is of great significance from a policy point of view, given that young immigrants in OECD countries, even in the case of second-generation immigrants, register completion rates lower than those of natives in high school VET programs, especially in the case of 5-year degrees. Furthermore, among VET graduates, the employment rate of immigrants is lower than that of natives, which may demotivate immigrant students to obtain a VET qualification (OECD, 2019). Focusing on the Italian case, in order to reduce the grade retention gap between immigrants and natives, given that children of immigrants are much more concentrated than natives in vocational high schools, quite different interventions should be designed for immigrant students at the extreme of the ability distribution. More specifically, on the one hand, high-ability young immigrants should be induced to choose an academic high school track rather than a vocational one, also by means of specific tutoring and career counseling programs (Carlana et al., 2021). On the other hand, low-achieving ones should be induced to pursue a qualification in the short vocational track which, according to our estimates, should ease their entry into employment.

References

- Bertrand M., Mogstad, M., Mountjoy, J. (2020), “Improving Educational Pathways to Social Mobility: Evidence from Norway's ‘Reform 94’”, *Journal of Labor Economics*, forthcoming
- Brunello, G., Rocco, L. (2017), “The effects of vocational education on adult skills, employment and wages: What can we learn from PIAAC?”, *SERIEs*, Vol. 8, pp. 315–343
- Brunetti, I. and Corsini, L. (2019), “School-to-work transition and vocational education: a comparison across Europe”, *International Journal of Manpower*, Vol. 40 No. 8, pp. 1411-1437
- Carlana, M., Pinotti, P., La Ferrara, E. (2021). Stereotypes about immigrant students and discrimination in grading. LISER, May 10.
- CNOS-FAP (2014), “Dossier ‘Istruzione e Formazione Professionale’ (IeFP)”
- EC (2020), “European Skills Agenda for sustainable competitiveness, social fairness and resilience”, EC.
- Eichhorst, W., Rodríguez-Planas, N., Schmidl R., Zimmermann, K.F. (2015), “A Road Map to Vocational Education and Training in Industrialized Countries” *Industrial and Labor Relations Review*, Vol 68 No. 2, pp.314-337
- Ghergo F. (2009), “La Formazione Professionale Regionale Iniziale: alla riscoperta di una identità”, Rassegna CNOS n.2, CNOSFAP
- Hall, C. (2012), “The Effects of Reducing Tracking in Upper Secondary School. Evidence from a Large-Scale Pilot Scheme”, *Journal of Human Resources*, Vol. 47 No. 1, pp 1 237-269
- Hall, C. (2016) “ Does more general education reduce the risk of future unemployment? Evidence from an expansion of vocational upper secondary education”, *Economics of Education Review*, Vol. 52(C), pp 251-271.
- Hampf, F. and Woessmann, L. (2017) "Vocational vs. General Education and Employment over the Life Cycle: New Evidence from PIAAC" *CESifo Economic Studies*, Vol. 63 No. 3, pp. 255-269.
- Hanushek, E.A., Schwerdt, G., Woessmann, L., Zhang, L. (2017), "General Education, Vocational Education, and Labor-Market Outcomes over the Lifecycle," *Journal of Human Resources*, Vol. 52 No. 1, pp. 48-87
- ISFOL (2004), “Le sperimentazioni dei nuovi modelli di istruzione e formazione professionale. Primo Rapporto di monitoraggio”, ISFOL
- ISTAT (2014-2019), *Rilevazione Continua sulle Forze di Lavoro – Annuale*. UniData - Bicocca Data Archive, Milano. Codice indagine SN204. Versione del file di dati 1.0
- Ryan, P. (2001), “ The School-to-Work Transition: A Cross-National Perspective” *Journal of Economic Literature*, Vol. 39 No. 1, pp. 34-92
- Meer, J. (2007), "Evidence on the returns to secondary vocational education," *Economics of Education Review*, Vol. 26 No. 5, pp. 559-573

- OECD (2019), “Unlocking the Potential of Migrants”, OECD
- Oosterbeek, H. and Webbink, D. (2007), “Wage effects of an extra year of basic vocational education”, *Economics of Education Review*, Vol. 26 No. 4, pp. 408-419
- Pastore, F., (2020), “The quasi-market of employment services in Italy”, *Journal of Policy Modeling*, Vol. 42 No. 6, pp. 1248-1269
- Pastore, F., Quintano C., Rocca, A. and Benincasa, O. (2021) “Stuck at a crossroads? The duration of the Italian school-to-work transition.” *International Journal of Manpower* , 42 (3), 442-469.
- Silliman, M. and Virtanen, H. (2021), “ Labor Market Returns to Vocational Secondary Education”, *American Economic Journal: Applied Economics*, forthcoming
- Torun, H. and Tumen, S. (2019), “Do vocational high school graduates have better employment outcomes than general high school graduates?”, *International Journal of Manpower*, Vol. 40 No. 8, pp 1364-1388
- Zagardo, G. (2013), “I cambiamenti nella IeFP”, CNOSFAP
- Zilic, I. (2018), "General versus vocational education: Lessons from a quasi-experiment in Croatia", *Economics of Education Review*, Vol. 62(C), pp 1-11

FIGURE I. The Italian school system before and after the reform.

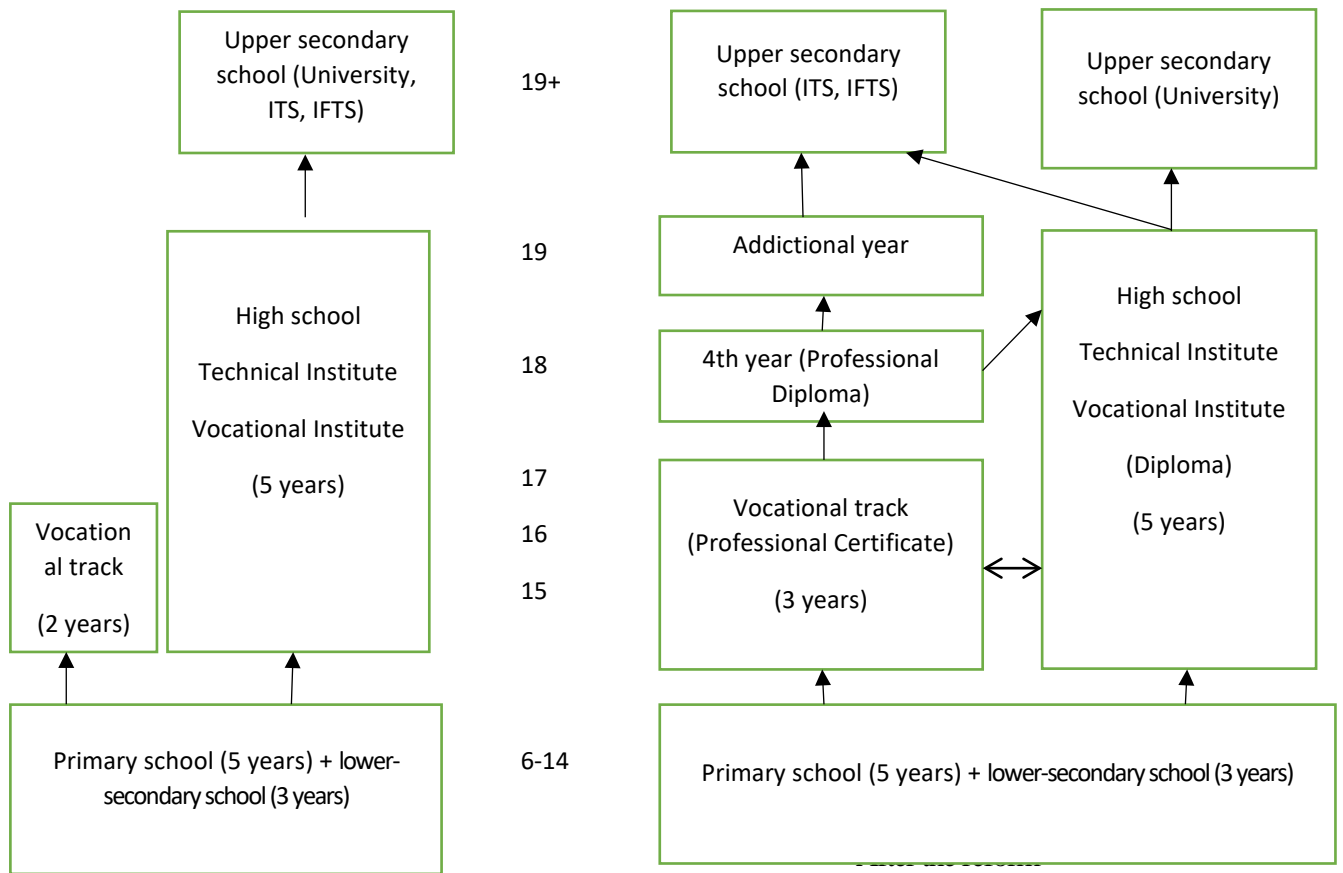


Table I: Implementation of the reform and assignment rules

Regions	(I) Year of the Reform	(II) Pivotal Graduation year: (I) + 3	(III) Year of birth of the pivotal cohort: (I)-14
Group 0 Trentino-Alto Adige	In the '90s	-	-
Group1 Lazio, Lombardia, Veneto, Piemonte and Puglia	2002	2005	1988
Group2 Liguria, Molise, Friuli Venezia Giulia, Emilia Romagna, Toscana, Umbria, Abruzzo, Campania, Basilicata, Sicilia and Sardegna	2003	2006	1989
Group3 Valle d'Aosta, Marche, Calabria	2004	2007	1990

Table II. Descriptive Statistics

	Mean (Std. dev.)	Before the reform (Std. dev)	After the reform (Std. dev.)
Length (in years)	1.8019 (2.675)	2.2861 (3.47)	1.422 (2.07)
Female	0.3128 (0.4636)	0.3169 (0.4653)	0.309 (.4623)
Immigrant	0.2594 (0.4383)	0.3301 (0.4703)	0.2030 (0.4023)
Age at graduation	17.335 (1.18)	17.16 (1.123)	17.4701 (1.212)
Field of study: Manufacturing	0.4336 (0.4983)	0.468 (0.499)	0.4056 (0.4910)
Field of study: Services	0.2448 (0.4300)	0.2064 (0.4048)	0.2754 (0.4467)
Field of study: Others	0.3006 (0.4608)	0.3042 (0.4601)	0.3075 (0.4615)
Obs.	8858	3928	4930

Table III: The effect of the Reform on school-to-work transition. DD estimates.

VARIABLES	(1) Length	(2) Length	(3) Length	(4) Length
Reform	-0.396*** (0.133)	-0.430*** (0.133)	-0.419*** (0.129)	-0.422*** (0.129)
Female			0.712*** (0.0607)	0.672*** (0.0657)
Immigrant			1.344*** (0.0662)	1.284*** (0.0674)
Field of study: Manufacturing				-0.322*** (0.0693)
Field of study: Services				-0.299*** (0.0785)
Constant	2.045*** (0.123)	2.242*** (0.295)	1.608*** (0.287)	1.842*** (0.291)
Observations	8,858	8,858	8,858	8,858
R-squared	0.071	0.083	0.137	0.140
Graduation year FE	YES	YES	YES	YES
Region FE	YES	YES	YES	YES
Year of birth FE	NO	YES	YES	YES

Note: the dependent variable is defined as the difference between the year the first job started and graduation year. The Reform is a dummy equal to 1 for those individuals that graduated after the introduction of the reform (see Table 1). Robust standard errors in parentheses. ***p<0.01; **p<0.05; *p<0.1.

Table IV: Robustness exercises

VARIABLES	(1) Length	(1) Length	(2) Length	(3) Length
	With an assignment rule based on birth cohorts	With province FE	Piemonte, Lombardia, Veneto and Trentino-Alto Adige	Shorter (+/-5years) bandwidth
Alternative definition of Reform	-0.271** (0.128)	-	-	-
Reform	-	-0.474*** (0.127)	-0.465*** (0.137)	-0.324** (0.147)
Constant	2.126*** (0.121)	1.770*** (0.330)	2.585*** (0.348)	1.089 (0.730)
Observations	8,985	8,858	5,524	5,508
R-squared	0.070	0.180	0.142	0.136
Graduation year FE	NO	YES	YES	YES
Region FE	YES	NO	YES	YES
Year of birth FE	YES	YES	YES	YES
Province FE	NO	YES	NO	NO

Note: Note: the dependent variable is defined as the difference between the year the first job started and graduation year. The Alternative definition of Reform is a dummy equal to 1 for those individuals who turned 14 after the introduction of the reform (see Table 1). The Reform is a dummy equal to 1 for those individuals that graduated after the introduction of the reform (see Table 1). Robust standard errors in parentheses. ***p<0.01; **p<0.05; *p<0.1.

Table V. Heterogeneous effect of the Reform on school-to-work transition. DID estimates.

VARIABLES	(1) Length	(2) Length	(3) Length	(4) Length
Reform * Male	-0.209 (0.135)			
Reform * Female	-0.853*** (0.152)			
Reform * Italian		0.000542 (0.134)		
Reform * Immigrant		-1.362*** (0.157)		
Reform*female*Immigrant			-1.538*** (0.215)	
Reform*male*Immigrant			-1.232*** (0.167)	
Reform*female*natives			-0.469*** (0.159)	
Reform*male*natives			0.236 (0.144)	
Reform * manufacturing				-0.253* (0.142)
Reform * service				-0.224 (0.161)
Reform * other field of study				-0.531*** (0.144)
Constant	1.750*** (0.291)	1.638*** (0.290)	1.930*** (0.294)	1.558*** (0.290)
Observations	8,858	8,858	8,858	8,858
R-squared	0.142	0.150	0.140	0.153
Individual characteristics	YES	YES	YES	YES
Graduation year FE	YES	YES	YES	YES
Region FE	YES	YES	YES	YES
Year of birth FE	YES	YES	YES	YES
P value Test reform*Male=Reform*Fem	0.000			
P value Test reform*immigrant=Reform*Native		0.000		
P-value Test reform*imm.*female=reform*imm.*male			0.141	
P-value Test reform*imm.*female= reform*native*female			0.000	
P-value Test reform*imm.*female =reform*natives*male			0.000	
P-value Test reform*imm.*male= reform*native*male			0.000	
P-value Test reform*imm.*male= reform*native*female			0.000	
P-value Test reform*native*female = reform*native*male			0.000	
P-value Test reform*manufacturing=reform*services				0.843
P-value Test reform*manufacturing=reform*others				0.0359
P-value Test reform*services=reform*others				0.0480

Notes: See Table III

Table VI: The role of the organisational model adopted. DID estimates

VARIABLES	(1) Length	(2) Length	(3) Length
Reform*Public schools	-0.368*** (0.134)		
Reform*Quasi-markets	-0.572*** (0.166)		
Reform*Public schools*Male		-0.145 (0.141)	
Reform*Public schools*Female		-0.816*** (0.159)	
Reform*Quasi-markets*Male		-0.402** (0.179)	
Reform*Quasi-markets*Female		-0.888*** (0.231)	
Reform*Public schools*Natives			-0.0154 (0.139)
Reform*Public schools*Immigrants			-1.210*** (0.166)
Reform*Quasi-markets*Natives			0.100 (0.180)
Reform*Quasi-markets*Immigrants			-1.882*** (0.228)
Constant	1.811*** (0.292)	1.723*** (0.292)	1.628*** (0.290)
Observations	8,858	8,858	8,858
R-squared	0.140	0.142	0.151
Graduation Year FE	YES	YES	YES
Regional FE	YES	YES	YES
Year of Birth FE	YES	YES	YES
P-value Test reform*public school=reform*quasi-market	0.15		
P-value Test reform*public school*female=reform*quasi-market*female		0.73	
P-value Test reform*public school*male=reform*quasi-market*male		0.10	
P-value Test Reform*public school*imm.=reform*quasi-market*imm.			0.00

Notes: See Table III